



T.C.

ANKARA YILDIRIM BEYAZIT UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

**TAXATION OF THE DIGITAL ECONOMY:
THE CASE OF TÜRKİYE**

MASTER'S THESIS

Ayşe KOÇ ERİSOYLU

DEPARTMENT OF PUBLIC FINANCE

ANKARA, 2024

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Thesis Supervisor
Prof. Dr. Hakkı ODABAŞ

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APPROVAL PAGE

The thesis study titled “TAXATION OF THE DIGITAL ECONOMY: THE CASE OF TÜRKİYE” prepared by Ayşe KOÇ ERİSOYLU was unanimously approved by the following jury as a Master's Thesis in Ankara Yıldırım Beyazıt University Graduate School of Social Sciences Department of Public Finance.

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DECLARATION

I declare that this thesis is my own work, that I have not had any unethical behaviour violating patents and copyright rights at all stages from planning to writing the thesis, that I have obtained all the information in this thesis within academic and ethical rules, and that I have cited all the information and comments used in this thesis. (06/05/2024)

Ayşe KOÇ ERİSOYLU



DEDICATION



To my lonely and beautiful country...

ACKNOWLEDGMENT

First, I would like to express my deep gratitude to my esteemed teacher and thesis advisor, Prof. Dr. Hakkı ODABAŞ, who has always supported and helped me during the writing process of my thesis.

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ABSTRACT

Taxation of the Digital Economy: The Case of Türkiye

Rapid developments in information and communication technologies (ICT) have significantly transformed the global economy and created the concept of the digital economy. However, this dynamic sector, despite its increasing importance, brings several problems. The primary challenge lies in effectively taxing the digital economy. Traditional taxation models fail to accurately reflect the value created by digital business models and the cyber economy. This circumstance may result in diminished tax revenues and an inequitable tax system.

The taxation of the digital economy is experienced internationally. Global and national studies include efforts to find a fair, effective, and sustainable solution for this taxation. In this context, it is important for countries to update their tax systems to make them suitable for the dynamic structure of the digital economy and to take steps to prevent tax evasion through international cooperation.

This thesis aims to reveal the taxation of the digital economy and the difficulties encountered in this context, to explain the international studies on the taxation of the digital economy and the solution proposals, and within this framework, to present some policy recommendations by examining the studies on the infrastructure and taxation of the digital economy in Turkish Tax Law. In addition, it is emphasised that international cooperation should be taken as a basis for effective and sustainable taxation in Türkiye and on a global scale.

Keywords: Digital Economy, Taxation of the Digital Economy, Turkish Tax Law.

ÖZET

Dijital Ekonominin Vergilendirilmesi: Türkiye Örneđi

Bilgi ve İletişim Teknolojileri'nde yaşanan hızlı gelişmeler, küresel anlamda ekonomiyi önemli ölçüde dönüştürmüş ve dijital ekonomi kavramını ortaya çıkarmıştır. Ancak bu dinamik sektör, giderek artan bir şekilde önem kazanmasına rağmen bir dizi sorunu da beraberinde getirmektedir. Bu sorunlardan en önemlisi, dijital ekonominin vergilendirilmesinde yaşanan zorluklardır. Geleneksel vergilendirme modelleri, dijital iş modelleri ve siber ekonomi tarafından yaratılan değeri doğru bir şekilde yansıtmada yetersiz kalmaktadır. Bu durum, vergi gelirlerinin düşük kalmasına ve adil olmayan bir vergi sisteminin ortaya çıkmasına neden olabilir.

Dijital ekonominin vergilendirilmesi uluslararası bir boyutta yaşanmaktadır. Küresel ve ulusal düzeyde yapılan çalışmalar, dijital ekonominin vergilendirilmesinde adil, etkili ve sürdürülebilir bir çözüm bulma çabalarını içermektedir. Bu bağlamda, ülkelerin vergi sistemlerini güncelleyerek dijital ekonominin dinamik yapısına uygun hale getirmeleri ve uluslararası iş birliği ile vergi kaçakçılığını önleyici adımlar atmaları önemlidir.

Bu tezin amacı, dijital ekonominin vergilendirilmesi ve bu bağlamda karşılaşılan zorlukları ortaya koymak, dijital ekonominin vergilendirilmesiyle ilgili yapılan uluslararası çalışmaları ve çözüm önerilerini açıklamak ve bu çerçevede Türk Vergi Hukuku'nda dijital ekonominin altyapısı ve vergilendirilmesine ilişkin çalışmaları inceleyerek bazı politika önerileri sunmaktır. Ayrıca, hem Türkiye hem de küresel ölçekte etkin ve sürdürülebilir bir vergilendirme için uluslararası düzeyde iş birliğinin esas alınması gerektiđi vurgulanmaktadır.

Anahtar Kelimeler: Dijital Ekonomi, Dijital Ekonominin Vergilendirilmesi, Türk Vergi Hukuku.

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LIST OF ABBREVIATIONS

3D	: Three-Dimensional
4D	: Four-Dimensional
B2B	: Business-to-Business
B2C	: Business-to-Consumer
B2G	: Business-to-Government
BEAT	: A Base Erosion and Anti-Abuse Tax
BEPS	: Base Erosion and Profit Shifting
BIAC	: Business and Industry Advisory Committee
C2C	: Consumer-to-Consumer
C2G	: Consumer-to-Government
CbCR	: Country-by-Country Reporting
CFA	: Committee on Fiscal Affairs
CFC	: Controlled Foreign Corporation
CTL	: Corporate Tax Law
DST	: Digital Service Tax
DTAA	: Double Taxation Avoidance Agreement
E-Commerce	: Electronic Commerce
ETBIS	: Electronic Commerce Information System
EU	: European Union
EUR	: EURO
G20	: Group of Twenty
G2B	: Government-to-Business
G2C	: Government-to-Consumer
GATS	: General Agreement on Trade in Services
GILTI	: Global Intangible Low-Taxed Income
IaaS	: Infrastructure-as-a-Service
ICT	: Information and Communication Technologies
IoT	: Internet of Things
ITL	: Income Tax Law
M2M	: Machine-to-Machine
MOSS	: Mini One Stop Shop
NFT	: Non-Fungible Token

OECD	: Organization for Economic Co-operation and Development
OSS	: One Stop Shop
PaaS	: Platform-as-a-service
PE	: Permanent Establishment
PPC	: Pay Per Click
R&D	: Research and Development
RA	: Revenue Administration
RFID	: Radio-Frequency Identification
SaaS	: Software-as-a-Service
SMEs	: Small and Medium-Sized Enterprises
TCJA	: Tax Cuts and Jobs Act
TL	: Turkish Lira
TPL	: Tax Procedure Law
TRIPS	: Trade-Related Aspects of Intellectual Property Rights
TUAC	: Trade Union Advisory Committee
UK	: United Kingdom
UN	: United Nations
UNCTAD	: United Nations Department for Trade and Development
US	: United States
VAT	: Value Added Tax
VERBIS	: Data Controllers Registry Information System
WTO	: World Trade Organisation

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INTRODUCTION

The effects of digital transformation give rise to the idea of the “digital economy.” Specifically, the migration of economic activity to the digital world is a result of the widespread usage of the Internet. Because of this, the idea and regulations of the “digital economy,” which has evolved as a new economic model, are starting to supplant the conventional notions and laws of the economy. The digital economy is a meta-concept encompassing all digital activities such as electronic commerce, internet advertising, and cloud computing.

The issue of taxing income generated by activities within the digital economy, surpassing the traditional economy and becoming the general economy itself, has become a globally discussed and significant matter. The ability of multinational companies to engage in trade and generate profits without the need for physical presence in countries where they lack establishment, along with resulting legal gaps in taxation, tax avoidance, tax evasion, and infrastructure issues, necessitates national and international regulations in this field. As a result, research is being carried out worldwide and nationally. Various prominent global organisations, including the Organisation for Economic Co-operation and Development (OECD), the European Union (EU), the United Nations (UN), and the World Trade Organisation (WTO), have undertaken endeavours to recognise difficulties in implementing current global tax regulations to the digital economy. They aim to formulate comprehensive solutions to address these challenges. The OECD’s “Base Erosion and Profit Shifting (BEPS) Action Plan” is particularly noteworthy in this context. Simultaneously, alongside international efforts to address issues related to taxing the digital economy, Türkiye has also begun implementing regulations on this subject in its domestic legislation.

The title of this study is “Taxation of Digital Economy: The Case of Türkiye”. The study aims to furnish information on the conceptual framework of the digital economy, the taxation of the digital economy, international studies on this issue, and the amendments made to Turkish tax law. Additionally, the study seeks to propose solutions within the context of Türkiye.

This study has four sections.

The first section, “The Digital Economy: Technologies, Developments, and Security”, covers the digital economy in detail. This section examines the definition of the digital

economy, its main features, and various digital economic business models. Additionally, it focuses on security issues and technological developments.

The second section, “Digital Economy and Taxation” begins with fundamental concepts and explanations about taxation. Subsequently, the challenges associated with taxing the digital economy and the problems arising within this scope are thoroughly discussed. This section also examines the studies on digital economy taxation carried out by organizations such as the OECD, EU, WTO, and UN and the studies of some selected country examples.

In the third section, “Regulations on Digital Economy in Turkish Tax Law,” the study explores developments and initiatives related to the taxation of the digital economy within the framework of Turkish tax law and provides specific suggestions on this subject.

It is noted that academic studies on the digital economy, which is anticipated to gain increased global importance, are currently insufficient in Türkiye and worldwide. This deficiency is also evident in studies covering the issue’s taxation, financial reporting, and auditing dimensions. This comprehensive study on the taxation of the digital economy and developments in Turkish tax law is expected to be valuable.

1. THE DIGITAL ECONOMY: TECHNOLOGIES, DEVELOPMENTS AND SECURITY

The transition from an industrial society to an information society has made Information and Communication Technologies (ICT) significant in the economic sphere. The main driver of economic growth is innovation via the diffusion, utilisation, and creation of knowledge. The development of ICT is used to measure the effectiveness of innovation performance in an economy (Johansson et al., 2006). With the rapid developments in ICT in recent years, the Internet has become widely used in many areas of life, resulting in the formation, and spread of commercial transactions in the digital environment. Various terms are used in the literature to describe the knowledge-based economy, such as information economy, network economy, knowledge economy, weightless economy, and the new economy (Özcan, 2016).

The concept of “digital economy” was first used by Tapscott (1995) in his work titled “The Digital Economy: Promise and Peril in the Age of Networked Intelligence”. In his book, Tapscott asserts that information undergoes digitalization in tandem with the digitalized economy and likens the dissemination of information to the “speed of light”. He further elucidates the primary distinguishing features of the “digital economy” concept, including virtualization, disintermediation, production by consumption, information, globalization, fragmentation, convergence, incompatibility, digitalization, innovation, inter-network communication, and instantaneity/speed. Reflecting on the new possibilities facilitated by information stored in computers and quickly traversing networks through the Internet, the significance of this situation is comparable to that of the invention of language (Tapscott, 1995).

Additionally, numerous scholars have studied the concept of the digital economy. Georgieva et al. (2020) state that Nicholas Negroponte introduced the most compelling explanation of the “digital economy” idea in 1995. Negroponte aimed to clarify the advantages of the swift expansion and incorporation of ICT (Georgieva et al., 2020).

In 2001, Mesenbourg enriched the definition of the digital economy by categorizing it into three parts: infrastructure (such as hardware, software, communication technology, and human resources), business models (new business models primarily based on digital

technologies), and electronic commerce (e-commerce) (the online occurrence of shopping transactions) (Mesenbourg, 2001).

As defined by Turcan et al. (2014), the digital economy represents a shift in economic activity propelled by digital technologies that facilitate cost-effective information processing and storage. This transformation is shaped by introducing new products, innovation, and globalization, altering market dynamics, facilitating institutional restructuring, and creating new opportunities for knowledge production (Turcan et al., 2014).

In their study, Bukht and Heeks (2017) proposed considering the concept of the Digital Economy within core scope, narrow scope, and broad scope categories. This categorization is briefly outlined as follows (Bukht and Heeks, 2017, p.68):

- Core Scope: This encompasses critical technologies related to digitalization, including hardware, software, information technology consultancy, information services, and telecommunications.
- Narrow Scope: It involves concepts such as the sharing economy and platform-based economy, which consist of digital services.
- Broad Scope: This encompasses different sectors of the algorithmic economy, advanced manufacturing, e-commerce, and precision agriculture, all of which are components of the digitalized economy. These digitized sectors naturally contribute to the Fourth Industrial Revolution.

According to the OECD, “The Digital Economy incorporates all economic activity reliant on or significantly enhanced using digital inputs, including digital technologies, infrastructure, digital services, and data. It refers to all producers and consumers, including the government, utilising these digital inputs in their economic activities” (OECD, 2020a, p.32).

In conclusion, the concept of the digital economy, which continues to evolve and enrich, is highlighted as a continually changing and valuable definition, much like the term “digital” itself.

1.1. Industry 4.0 and Emerging Technologies

Industry 4.0 results from the industrial revolution, with information technology, machine development, automation, and instant data. The production process has become more effective and complicated during this era of digitalization. In 2011, the German company adopted Industry 4.0 to increase the country's competitiveness in its industry. Production processes are being digitized, and increased automation, data analysis, the integration of Internet of Things (IoT) technologies, and the use of artificial intelligence are emerging. Industry 4.0 dramatically changes production processes, supply chains, business models, and customer relationships. Therefore, this is a strategic necessity (Kagermann et al., 2013).

As digitalisation has become an inevitable necessity for industries, transforming production processes into intelligent systems is becoming increasingly important. Rapid developments in manufacturing technology increase industry efficiency, which is very important for companies' competitive advantage. Industry 4.0 is drastically changing business models and processes. (Vaidya et al., 2018).

Within the domain of Industry 4.0, the fusion of ICT Industry 4.0, integrating ICT and production systems forms the basis of industrial processes. Intelligent production systems replace traditional systems. This includes using new technologies such as artificial intelligence, data analysis and automation. Industry 4.0 makes factories more efficient, flexible, and customizable. This circumstance ensures that companies have a competitive advantage. To successfully implement Industry 4.0, they must adapt to digitization and provide their employees with opportunities for continuous training and skills development (Meissner et al., 2017). This process involves information and Internet technology production systems and is called a digital revolution.

The digital economy and Industry 4.0 are increasing the importance of innovation by changing economic systems and redefining global competition. Due to this change, developing countries focus heavily on innovation to accelerate economic growth. However, developed countries take vital knowledge, technology, and innovation positions to maintain and strengthen their global leadership. The digital economy profoundly impacts the production of goods and services, economic dynamics, and business, changing production processes and business models. Therefore, access to technology and information is crucial

to achieving a competitive advantage. Companies need constant innovation to increase their competitiveness (Jovanović et al., 2018).

The digital economy involves collecting, analysing, and using digital data from various activities. These digital data consist of digital footprints of users' personal, social, and business interactions. The digital economy grows with the data generated by sensors, mobile devices, social media platforms and other digital tools. In addition, new business arms have emerged with new technologies such as data analytics, creative design, and digital marketing. Therefore, the demand for an information technology-informed workforce is increasing, significantly impacting the digital economy's economic structure and labour force dynamics.

Since the early 1990s, the widespread adoption of the Internet has spurred innovations that have fueled economic growth in developed countries. In the 2010s, the digital economy was the foundation of global growth. There are several differences between countries' levels of adoption of the digital economy and technology, which determine how the country's economies are affected by this. In this context, the adoption, availability and use of ICT are based mainly on differences between countries' economic performance and global powers (Mitrović, 2020).

The digital economy is expanding alongside the increasing popularity of social media, digital technologies, and the Internet. Rapid advancements in ICT have facilitated the growth of Internet-based commerce. As a result, companies are turning to digital trading models, and online shopping is becoming more popular. This constant shift in the ICT sector contributes to future economic growth by promoting trade digitisation.

With Industry 4.0 being regarded as a new concept, there is growing debate around the world about a society model known as a "super-smart society" or "Society 5.0." This model examines how digitization and artificial intelligence affect social life and the interactions between humans, robots, and machines. The digital economy and digital technology are crucial economic tools. This new social model offers an excellent framework for comprehending and managing the interactions between humans and technology (Fukuyama, 2018).

Because of Industry 4.0, digitalisation has become even more significant as a new weapon for economic growth because numerous high-tech products are quickly incorporated

into daily life. Given the widespread recognition of these technologies' favourable effects on growth, it is not unexpected that ICT rank first among these new criteria. In this regard, digitalisation has evolved into a force supporting and transforming economic growth by streamlining corporate procedures and boosting productivity.

1.2. Overview of the Digital Economy

1.2.1. Key Features of the Digital Economy

Don Tapscott (1995), who introduced the concept of the digital economy to the literature, in his book “The Digital Economy: Hope Danger in the Age of Networked Intelligence”, emphasised the characteristics of the digital economy with the expressions of information, digitalisation, virtualisation, fragmentation, inter-network communication, no intermediaries, convergence, innovation, production through consuming, speed, globalisation and incompatibility (Akkaya and Gerçek, 2019). Tapscott states that information spreads at the speed of light in the digitalised economy, as reflected in statistics.

According to the latest statistics, in 2023, despite a 15% decrease in brand value from \$350.3 billion to \$299.3 billion, Amazon has reclaimed its position as the most valuable brand in the world. Apple's brand value has declined by 16% to reach \$297.5 billion, causing it to drop to the second position as the world's most valuable brand. Among the notable brands with significant growth in brand value are Tesla, with a 44% increase to \$66.2 billion, and BYD, with a 57% increase to \$10.1 billion. This growth can be attributed to the increasing demand for electric automobiles, driven by the broader shift towards a low-carbon economy (Brand Finance, 2023).

Moreover, the Digital Economy Report (2021), prepared by the United Nations Department for Trade and Development (UNCTAD), presents several noteworthy conclusions regarding the development of the digital economy. As one of the metrics for measuring data-driven digitalisation growth, UNCTAD indicates that global Internet protocol traffic is expected to surpass all traffic recorded up to 2016 in 2022. The report highlights that the global data movement is a significant international economic occurrence promoting global dedication. Moreover, the research emphasises that the COVID-19 pandemic has accelerated the need for governments to shift towards the digital economy (UNCTAD, 2021).

The process of globalisation, coupled with the rapid progress of technology, has led to an unavoidable transformation in both economic and social domains. In addition to the rapid growth of the digital economy, social demands and unexpected occurrences also significantly impact this transformation process. The global ramifications of the COVID-19 outbreak have expedited the path of digital transformation for all nations. Digitalisation during the pandemic has resulted in significant changes, particularly in online education activities, healthcare, and numerous public services. The utilisation of digital services has seen a substantial increase, compelling a global shift towards digital transformation by reshaping traditional habits and business practices (Śledziewska and Włoch, 2021).

This compelled digital transformation, which has expedited the reinforcement of technological infrastructures, the cultivation of digital skills, and the digitisation of various sectors. Leveraging this digital transformation process becomes crucial to establishing sustainable and more effective service models. At this juncture, societies and organisations must adapt to the digitalisation process and formulate digital strategies for the future (Śledziewska and Włoch, 2021).

The digital economy has several essential elements that create new business models and activities. The key elements included in this context are the ability to move quickly, the dependence on data and user feedback, the positive effects that come from integrating and combining different elements, the use of business models that involve multiple parties, especially in cases where different tax jurisdictions apply to each side of the market, the tendency towards monopoly or oligopoly, and the presence of variability (OECD, 2015).

1.2.1.1. Mobility

Mobility means the flexibility of businesses to choose the location of their servers and other resources, as well as the ability of businesses to adjust the number of staff they employ in local areas and the number of staff that can perform specific jobs. The digital economy focuses on and analyzes mobility as a concept through three perspectives: Intangible assets, according to users and according to business functions. Briefly, mobility refers to the capacity of businesses, users, and customers to conduct and manage their operations from any location and at any time (OECD, 2015).

1.2.1.1.1. Mobility of Intangible Assets

The use and advancement of intangible assets are crucial in the digital economy. Businesses in the digital economy strive to enhance their growth and generate economic value by investing in and cultivating intangible assets. For instance, digital companies frequently rely on software as the foundation of their operations and invest substantial resources in research and development to enhance existing software or create new software products (OECD, 2015).

According to current tax rules, intangible assets can be readily allocated and transferred between entities, enabling the separation of legal ownership of assets from the actions responsible for their creation. The property of these assets can be easily transferred, preventing it from being taxed in the country where value is created. This circumstance makes it possible to tax in countries with lower tax rates. With mobility's dynamic process to the economy, thousands of sellers and buyers can meet anywhere, anytime; firms become very mobile geographically. Moreover, in this way, the dimension of competition ceases to be national and gains a more global character (Akyazı and Kalça, 2003). Therefore, the boundaries of the national tax legislation of countries are transcended, and tax revenues are affected.

1.2.1.1.2. Mobility of Users and Customers

The digital economy enables an unparalleled degree of mobility. Digitalisation has increased the importance of intangible assets in comparison to physical output. Since a digital product can be replicated at minimal expense after its design is established, value generation typically occurs during the blueprint creation phase. Digitalisation has empowered companies to decrease operational costs, making production factors more mobile (Boccia and Leonardi, 2016).

With the almost negligible cost of storing and transporting digital products, the geographical mobility of items has significantly increased. The advancements in ICT, coupled with the rise in Internet access rates, have contributed to the surge in commercial activities conducted by international travellers over the Internet (Olbert and Spengel, 2017). For instance, a person can acquire an application while dwelling in one country, stay in a second country, and then utilise it in a third country. Consumers' utilisation of virtual

networks intensifies the challenges their heightened mobility poses. Nevertheless, this results in the anonymity of numerous online exchanges, posing challenges in identifying and tracking users (OECD, 2015).

However, this enables enterprises to conduct business in global marketplaces, adding extra competition to local markets and firms. Tax authorities may decline tax revenues due to the difficulties in collecting indirect taxes, and the lack of a physical presence for overseas producers makes it difficult to collect direct taxes (Boccia and Leonardi, 2016).

According to Boccia and Leonardi (2016), digitalisation has heightened the mobility of products, with digitised versions gaining market share over analogue products. The transition from owning ICT gear to utilising cloud-based ICT services has enhanced the mobility of goods and services. Consumers now have the alternative to avail and utilise services for a restricted duration rather than making direct purchases. The increasing complexity in identifying producers due to the blurring of the difference between producers and consumers may present issues for tax authorities (Boccia and Leonardi, 2016).

1.2.1.1.3. Mobility of Business Functions

Due to advances in telecommunication technology, information management software, and personal computers, highly complex business activities can be organised and coordinated over long distances. Consequently, these opportunities have significantly reduced the cost of business activities. Considering these developments, businesses have managed their worldwide operations from a centralised location of their choice, regardless of where transactions are made or where their suppliers or customers are located (Unhelkar, 2008). According to OECD data, India, Ireland, the USA, Germany, the UK, and China are the leading countries in information and communication services, accounting for approximately 60% of total ICT service trade exports (OECD, 2015).

Rapid technological progress has enabled organisations to obtain real-time market information and analysis efficiently. This advancement has not only enhanced the rapport between companies but has also intensified competition. The advancements in communication, information management software, and personal computer technology have considerably diminished the expenses of organising and conducting complicated operations, such as coordinating activities across vast distances. This technique has also encouraged the

development of innovative and effective business models, allowing for seamless integration into global or regional business frameworks controlled not only on a country-by-country basis but also from a centralised place. Indeed, because of this development, many SMEs (small and medium-sized enterprises) have become multinational micro-companies that provide employment and operate in many countries and on different continents (OECD, 2015). Before the advent of the digital economy, only large multinational corporations could invest in expensive new technologies. However, with the introduction of digital tools, small and SMEs have gained the ability to expand their global reach rapidly and affordably (Ganne and Lundquist, 2019).

1.2.1.2. Trust in Data and User Opinions

Companies within the digital economy frequently gather data about their customers, suppliers, users, and operations. For instance, if a user benefits from a product or service, comments on it can improve or encourage it to be offered to another customer group. In other words, consumer-to-producer externalities are more effective in digital economies. Therefore, in some digital economy businesses, data collected by customers and users is becoming increasingly important. In business models focused on specific social networks, companies often report to their investors on active value-creating collaborations with users (Endo, 2017).

Analysing the data collected based on user opinions with advanced analytical tools allows e-commerce firms to reduce costs and benefit from numerous advantages compared to traditional trading firms (Aker and Wambo, 2016). By subjecting large amounts of data to analysis and revealing and transforming it, “value” is created by producing economically valuable information and gains (Verhoef et al., 2016). The value created through an advanced analytical analysis not only expands the volume of economic gains but also increases the number of intermediary institutions, creating a competitive environment in this field and enabling more comprehensive and accurate analysis.

Data collected through various means can be either personal or non-personal. Although the distinction between personal and non-personal data is not very clear, the collection of personal data can generally be obtained directly from the customer, based on tracking/observation (e.g. by tracking and recording the customer’s Internet browsing preferences and location data) or based on analysis (through analysis of a combination of

several different classes of data). On the other hand, non-personal data is generated by combining data from private and public sources (OECD, 2015).

1.2.1.3. Network Effects

The network effect is the benefit gained from decisions previously made or shared by other users. It occurs when the number of users for a product or service increases, leading to the ideal utility for the consumer (Katz and Shapiro, 1985). Hence, the value of network subscriptions is higher when the network has more subscribers. Let us assume that a million people in a country are connected to a network and two million more. In that case, this improvement will benefit the second two million and the first one million due to network effects. Firstly, given that we understand market demand should be downward sloping and utility functions should not intersect, network effects seem entirely implausible to us. Secondly, network effects make it challenging to quantify the utility and value of a network since they rely on team dynamics. Nevertheless, it is crucial to present the entire impact of the changes brought about by ICT and the benefits that can be realised through its promotion and implementation in numerical terms (Hilbert, 2001).

The digital economy is notable as one of the places where increased productivity is most evident. A company's productivity depends on the number of its customers. Better service attracts customers, and they want more. The network's size affects the service quality due to network effects. Network effects were initially active in the traditional economy, but with digitalisation, they have become present in the digital economy and have increased dramatically. They can provide better services than traditional professions (Colin et al., 2015).

Network effects can emerge from the marginal utility that users provide to one another. The value generated by this system increases proportionally with the number of users. Network effects occur when a corporation connects two market sides through a network, as explained by Magnin (2016). Network effects are utilised to provide additional value and enhance market position. Businesses pursuing this objective establish a network architecture by disseminating software across multiple devices and objects (such as phones and computers). They then utilise this network to market and sell products or services to device owners or advertisers. According to the OECD (2015), in this approach, firms prioritise creating value by making money from externalities produced through network effects.

Network effects can arise in some business models when Many customers and sellers obtain a competitive advantage. A retail website could create an Internet-based platform that allows consumers to evaluate, review, and categorise products. User ratings and reviews facilitate users in making well-informed decisions, while product tagging enhances customers' capacity to discover things that align with their interests. A corporation can leverage another network effect to enhance value and bolster its market position (OECD, 2015).

In the digital economy, companies within specific sectors leverage network effects to augment their market share and attain a competitive advantage. With the rapid advancement of technology, these companies are successfully navigating their growth trajectories by expanding their customer base and introducing innovative products and services. Furthermore, firms that bolster customer interaction and enhance user experience through digital platforms are increasingly empowered to sustain market leadership positions. These companies deploy digital marketing strategies to foster deeper customer connections, augmenting their competitive edge (Iansiti, 2021).

Companies exploit their market position to consolidate their dominance despite market volatility. In markets with these tendencies of companies, network effects grow. Some studies argue that network effects create a permanent monopoly of a product or service. In contrast, other studies argue that these effects occur in the form of more limited and successive monopolies. However, there is a tendency towards monopoly (Kemper, 2010).

Monopolisation in the digital economy, coupled with low entry barriers, rapidly evolving technologies, and the need for constant innovation, has resulted in many companies losing market share or experiencing rapid growth. Thus, the “big fish eat small fish” is valid and felt.

1.2.1.4. Multilateral Business Models

A multilateral business model involves various groups interacting through a common platform or intermediary, where each group's decisions impact the other group's behaviour through positive or negative externalities (Campbell-Kelly et al., 2015). The multilateral business model has emerged because of ICT progress. According to Rosen (2019), short-term exchanges include setting up meetings between buyers and sellers, long-term alliances, and teamwork to achieve common goals. A multi-stakeholder model is a system in which

stakeholders engage to create value (Rosen, 2019). The costs of the other party increase when the actions of one party have a positive externality for the other party (e.g., every extra user clicking on links sponsored by advertising). A card payment system is an example of a multilateral business model that creates positive externalities for numerous market participants. Companies like Amazon.com and eBay are the most well-known and recognised players in this field (OECD, 2015). Multilateral business models are vital in the digital economy as they reduce market costs.

The development of multilateral business models has brought a growing concern regarding the taxation of enterprises that embrace this approach. Because these businesses can set prices as they wish to trade goods and services between themselves, the problem of transfer pricing has emerged. Transfer prices that deviate from market rates based on supply and demand violating the arm's length principle, are intended to shift revenue to countries with lower tax rates and minimize the tax burden (Collins et al., 1997).

1.2.1.5. Monopoly and Oligopoly Tendency

Companies operating in the digital economy can achieve faster growth and market dominance compared to other firms in the overall economy. Companies can swiftly dominate the market in nascent markets due to low costs and the amalgamated impact of network effects. Network effects influence users in the market to predominantly favour a single supplier, leading to the market's dependence on this sole access point for users. A company's substantial market share results from network effects and user preferences. Competition within the digital economy often takes place in markets where several companies hold a monopoly. This circumstance, coupled with reduced barriers to entry, can have cascading effects on other markets. Consequently, the digital economy, characterised by diminished barriers to entry, may also impact other sectors, potentially making it one of the first markets to experience reduced barriers to entry (OECD, 2015).

In the digital economy, companies operating in a specific sector can experience substantial growth and long-term dominance compared to other companies. While network effects play a crucial role in helping companies establish a monopoly or oligopoly in specific markets, the digital economy introduces a broader market influence that can foster and mitigate monopoly or oligopoly market power (Hodžić, 2018).

As stated by Filippov et al. (2019), improvements in science and technology have led to the emergence of the Fourth Industrial Revolution, often known as Industry 4.0. This revolution is anticipated to bring about substantial changes in economic activity, encompassing the generation, dissemination, utilisation, and management of all goods and services, ultimately giving rise to novel economic systems. The advent of digitalisation results in a gradual decline in competition and a corresponding rise in monopolisation. The business environment of a specific country primarily shapes the practice of forming and developing entrepreneurial potential. One of the principal challenges in the digitisation of the economy is a decline in competition, accompanied by a rise in market monopolisation (Filippov et al., 2019).

1.2.2. Elements of the Digital Economy

1.2.2.1. Electronic Commerce Applications

As a result of rapid technological development, computers have become effective in the economic field as in all areas of life, and electronic commerce applications have gained strategically important in economic life. According to the World Trade Organization (WTO), electronic commerce entails the exchange of goods and services via telecommunication networks. It encompasses various activities such as production, advertising, marketing, and distribution. Electronic commerce involves conducting all commercial transactions electronically, from initiation to completion (ITO, 2006).

The WTO introduced the concept of e-commerce in 1998. Subsequently, e-commerce councils were established during conferences held in various countries, including Geneva, Doha, Nairobi, Buenos Aires, and Hong Kong, at specific intervals. The WTO continues to address challenges in this area, particularly during the COVID-19 pandemic, through collaborative efforts under the initiative named “A Multilateral Work Programme on E-Commerce” (WTO, 2019).

According to Statista’s projections for 2023, the total value of worldwide e-commerce transactions is expected to reach \$6.3 trillion. Online retail is expected to contribute 19.5% to global retail sales. By 2026, this figure is expected to increase to \$8.1 trillion, and the proportion of e-commerce sales compared to overall retail sales is predicted to reach 23% (Statista, 2023). This circumstance indicates a sustained growth trajectory for electronic

commerce. The graph below depicts the percentage value of worldwide retail e-commerce sales realized between 2015 and 2023 and the projected percentage value of retail e-commerce sales from 2023 to 2027.

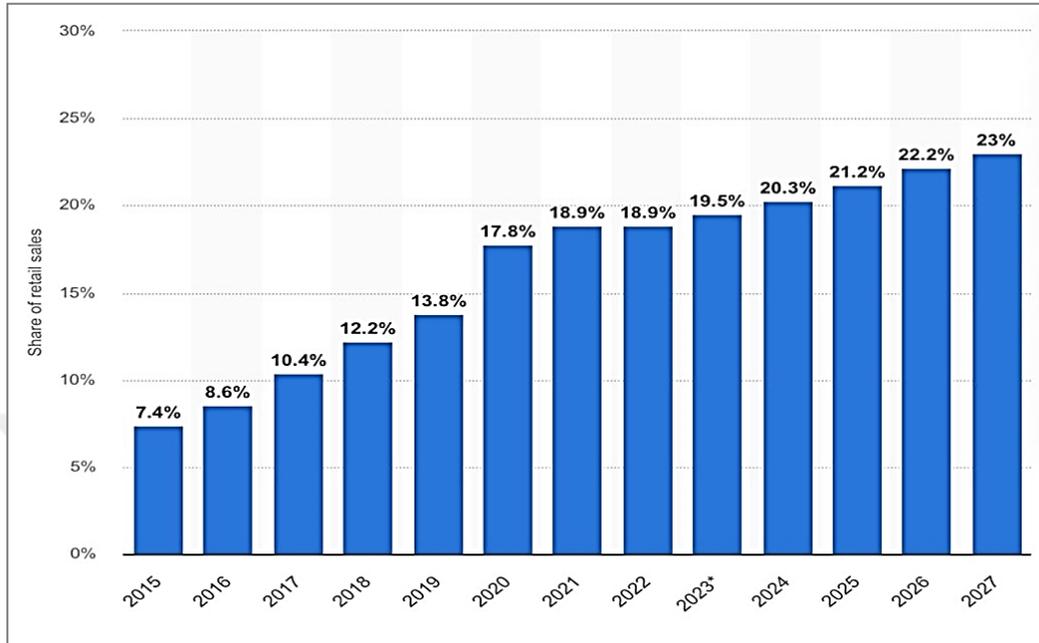


Figure 1. E-commerce as a percentage of total retail sales worldwide, 2015- 2027.

Source: Statista (2023).

Figure 1 illustrates a consistent upward trend. The notable 4% change in 2020 indicates the impact of Covid-19 on e-commerce. According to Van Duy (2023), the COVID-19 pandemic, which presented opportunities in various online sectors such as work, trade, and education, catalysed the development of these domains. It spurred the need for both economic and social transformation (Van Duy, 2023). The most prominent example of this transformation is evident in the e-commerce sector. While acknowledging that the surge in the e-commerce industry in 2020 due to COVID-19 is explicable, it underscores the possibility that the continued growth in 2021 signifies a genuine behavioural shift towards e-commerce (Morgan Stanley, 2022). In addition, according to TÜSİAD (2022) data, while e-commerce applications worldwide reached 44.5% in 2020, this rate is expected to reach 51.7% in 2024 (TÜSİAD, 2022).

In a concise definition, e-commerce encompasses all online economic and commercial activities conducted digitally without physical interaction between the parties.

E-commerce is carried out in the form of business-to-business (B2B), business-to-consumer (B2C) and consumer-to-consumer (C2C), considering the parties supplying and demanding the goods and services subject to trade. In addition to these, business-to-government (B2G), government-to-business (G2B), government-to-consumer (G2C), consumer-to-government (C2G) and machine-to-machine (M2M), which was created with the effect of digitalisation.

A significant portion of e-commerce consists of B2B transactions. Companies engage in various commercial transactions on the Internet. This transaction is the online version of traditional business models where a wholesaler receives deliveries of goods online and then sells these goods online to consumers in retail stores (Alrubaiee et al., 2012).

According to Stimson (2006), another issue is that Internet Access is a problem for businesses, but this involves more than local differences in ICT services. One of the lasting consequences of the “dot.com boom” is the swift growth of B2B electronic centres. These centres facilitate collective purchasing and selling for companies, providing substantial pricing, sales, and other advantages to participants who aim to operate at the forefront of technology (Stimson, 2006).

B2C trade is one of the oldest forms of e-commerce. The goods or services sold in the B2C trade model can be tangible or intangible (digital) assets. Through digitisation, which involves converting information into a digital format, various forms of content, such as text, audio, and visual pictures, can be transmitted electronically to geographically distant customers. This eliminates the requirement for customers to physically visit the seller's location (Chaffey, 2015). In this trade model, businesses can sell their goods or services on shopping sites with the products of many businesses (such as hepsiburada.com and trendyol.com) or in their virtual stores. The B2C trade model can significantly shorten supply chains by eliminating many intermediaries.

The C2C trade model is becoming increasingly widespread in e-commerce. In this model, e-commerce businesses help individual consumers sell or rent their assets by posting them on their websites. In recent years, many online platforms such as “eBay.com” have been developed within the scope of this model. Consumers come together as buyers and sellers on these platforms, holding auctions for goods and services, submitting price bids,

and discussing the characteristics of the items being traded, resulting in significant transactions (OECD, 2009).

The B2G trade model includes all kinds of goods, services and obligation fulfilment models directed to the state apparatus, such as submitting bids through electronic bidding methods created by the state mechanism, participating in the tender, submitting tax returns through electronic tax applications, sending notifications and petitions, and paying debts (Çolak, 2020).

The citizen-oriented service strategy has recently gained popularity by implementing the G2C model. In this context, all digital public services that emerged throughout the paper-to-digitalisation transition process can be considered (Pappa and Stergioulas, 2006).

The C2G business model involves citizens paying their taxes, paying penalties for moving violations, and making social security contributions to the government. C2G e-commerce models underpin all payments made to the government via the e-government system. Furthermore, several government agencies allow their constituents to pay via official websites (Pappa and Stergioulas, 2006).

As a result of digitisation, the M2M commerce concept was born. It involves e-commerce between machines. This paradigm, which involves the continuous interchange of data and information among machines, is a futuristic vision for e-commerce. It captures the transformation experience in digitisation, especially regarding AI and the Internet of Things (Çolak, 2020).

1.2.2.2. Application Stores

The increasing use of online services brought about by the widespread adoption of smartphones and tablets has contributed to the expansion and pervasiveness of app stores. These stores are often incorporated into operating systems and serve as digital distribution channels for software. Some app shops are only available to owners of electronic devices, while others are available to a broader range of consumers (Budak, 2018).

Operating systems often include app stores as digital distribution channels. The surge in Internet access via smartphones and tablets has consequently driven the escalated utilisation of online services, contributing to the evolution of app stores. App stores have

generally evolved as centralised retail platforms where consumers can access, view information, and automatically download and install the app by purchasing it on the device. Many online sites and services offer standalone applications that are easier, faster, and more efficient than entering an Internet address. Certain app shops are exclusive to consumers with a particular device, whereas others are open to consumers of any device utilising a specific operating system. (OECD, 2015).

Apps available in app stores can be offered at no cost or for a fee. Ad-supported apps are commonly available for free. Moreover, applications are progressively transitioning to a “freemium” business model. Under this model, users can access the essential functions of the application for free, but they need to pay for additional content or features (OECD, 2015). The most well-known app stores today are the Google Play and Apple App Store. Examples of mobile applications include WhatsApp, X, and Instagram.

1.2.2.3. Web-based Advertising

The advertisements in online marketing that use tools such as text, images, sound, and animation in online applications and websites are called Internet advertisements. The Hotwired site implemented the first banner ad for web-based or online advertising in 1994. However, Internet advertising has established itself as a novel form of advertising in the market. Like all other types of advertising, is to provide interaction between seller and buyer. In contrast to traditional advertising, consumers can interact with online advertisements. Internet users can click the ad for more information and purchase the product. With the rapid expansion of the Internet, Internet advertisements have begun to significantly impact the consumption trends of younger generations (ITO, 2006).

This breakthrough, poised to revolutionise the advertising industry’s future, has prompted significant publishing houses and proponents of the digital platform as an investment avenue to prioritise a more sophisticated approach to web advertising. They now perceive web pages not just as repositories of information but as versatile mediums capable of conveying diverse messages. The development of information and processing technologies has spawned a novel market within the digital landscape for the advertising sector, driven by the proliferation of web pages and internet-capable devices (Li and Leckenby, 2004)

In his book “Big Tech and the Digital Economy: The Oligopoly Scenario”, N. Petit (2020) emphasises the massive scale of online advertising, highlighting the intense competition among firms. According to empirical evidence, this competition does not result in horizontal differentiation in privacy quality. However, there is a monopolisation effect, leading to increased advertisement prices. The findings suggest that as the advertisement price increases, the exposure rate also increases. In other words, increased competition in online advertising may compromise privacy (Petit, 2020).

1.2.2.4. Three-Dimensional (3D) and Four-Dimensional (4D) Printing Technology

The fourth industrial revolution, Industry 4.0, involves using intelligent machines and artificial intelligence to integrate virtual and physical systems. In this new industrial revolution, smart factories are replacing traditional manufacturing processes, thanks to advancements like the Internet of Things, sophisticated sensors, artificial intelligence, cloud technologies, advanced robotics technologies, and 3D and 4D printing. These improvements and advancements in ICT can lead to new business models. Thus, productivity increases and industrial innovation has a broader impact on and influences the industrial environment (Szozda, 2017).

Three-dimensional printing technology streamlines the process of offering goods and services to people and businesses by decreasing the steps involved in production, transportation, assembly, and distribution. Furthermore, it provides the chance to generate output by minimising the quantity of unused material compared to conventional production methods. (OECD, 2015). Three-dimensional printing involves the process of creating tangible objects by printing them from a digital design in a three-dimensional format. Three-dimensional printers are responsible for carrying out this procedure. It is possible to use various raw materials such as metal, plastic, ceramic, wax and even chocolate (Szozda, 2017). It is possible to use 3D printers in many fields, such as education, health, and the defence industry. Many countries are working on producing artificial organs in 3D in medicine. Some countries are testing the use of parts produced with 3D printers in fighter jets. They are taking initiatives to use parts from 3D printers instead of repair, maintenance, and broken parts in defence expenditure items in their budgets. They are developing technologies that can make urgent part replacements with a 3D printer to be taken to the war zone and produce new weapons for soldiers (Yampolskiy et al., 2016).

Employing three-dimensional printing technology, manufacturers can sell their products directly to customers without needing a physical presence in foreign markets or relying on intermediary businesses. Therefore, businesses that only provide design supply and perform activities that do not require additional product marketing personnel and organisations can exclude the digital products and services they offer from taxation by locating their headquarters in a tax haven country (Albright, 2016). An additional challenge involves the uncertainty surrounding the nature of income generated by evolving 3D printing technology.

For instance, online delivery directly by the producer and from another country may be classified as royalties or fees for technical services rather than commercial gain. Therefore, the uncertainty of the circumstances and conditions for determining the nature of the income makes taxation difficult (OECD, 2015).

3D printing has brought about significant advancements, particularly in healthcare. This technology is invaluable in manufacturing surgical instruments and creating intricate models of organs slated for surgery. Such applications empower medical professionals with enhanced preparedness for interventions in patients' bodies. Moreover, recent innovations like bioprinting facilitate the fabrication of organs through the layered application of a bio-ink containing living cells. This breakthrough holds the promise of crafting organs tailored to individual bodies.

Additionally, 3D printing facilitates the production of personalised implants and prosthetics. This capacity improves treatment procedures by providing solutions more closely aligned with patients' needs and anatomical characteristics (Śledziowska and Włoch, 2021). These developments represent a significant shift in the health sector and open new treatment paths.

In addition to 3D printing technology, 4D printing technology has gained importance with the improvements in ICT. Innovative materials that adapt to external environmental conditions and can change their quality add a new dimension to transforming digital data into physical products using 3D printing technology. These intelligent materials are transformed into products using 4D printing technology. 4D printing has emerged by adding a fourth dimension to the three-dimensional design and production process, including width, length, and height. In 4D printing, the material used can be programmed. In this way, physical

objects can change form and function after production. Since change takes a certain amount of time, the fourth dimension is called the time dimension (Tibbits et al., 2014).

1.2.2.5. Cloud Computing Services

Cloud computing is a method for accessing, using, and obtaining computing applications and resources from any location with an Internet connection. It allows businesses and organisations to obtain and use these resources efficiently. Businesses adopt different cloud solution models, and depending on these models, all or part of the hardware, software and data of the business can be in a technology centre that is shared with other organisations and managed by third parties without the need to in its technology infrastructure (Oscar et al., 2015). In an alternative definition, cloud computing is described as a data centre comprising both software and hardware, focusing on the spatial aspect of cloud computing. According to the definition that emphasizes Cloud Computing's provision of hardware resources as a service, it is a technology that allows businesses to access their infrastructure over the Internet (Armbrust et al., 2010). Cloud computing can be utilized without time and location constraints, following established procedures and agreements. Hardware and software costs are comparatively low. Cloud computing updates instantly and offers unlimited storage capacity (Mathew and Rodrigues, 2018).

There are two essential concepts in cloud computing technology: “Cloud Service Provider” and “Multi-tenant”. A cloud service provider is a third-party information provider that performs delivery, hosting, monitoring, and different applications. Businesses can transact with multiple cloud service providers depending on the cloud solutions. A tenant is a single tenant among many tenants that share resources and technologies in cloud computing (Oscar et al., 2015).

Cloud computing has the benefits of being easily accessible from anywhere, cost-effective, fast, secure, flexible, scalable, and able to update quickly and seamlessly (Salesforce, 2020).

Based on IDC’s projections, the expenditure on cloud infrastructure for computing and storage is anticipated to increase at a compound annual growth rate of 12.4% between 2020 and 2025. By 2025, it is estimated to reach \$118.8 billion, constituting 67.3% of the overall spending on computing and storage infrastructure (IDC, 2021).

Cloud computing consists of three primary services: “Infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS).” (Red Hat, 2022). In general terms, SaaS targets end-users, PaaS targets application developers, and IaaS targets system experts and network architects (Tayaksi et al., 2016).

Infrastructure as a Service, IaaS: In the cloud service model, customers can customise the processor, storage, network resources, and other fundamental computing resources they require. They can also install the necessary operating systems and applications on these resources. While the client lacks management and complete control over the infrastructure, they possess complete control at the operating system level. They can operate network components like firewalls (Yüksel, 2012). Examples of IaaS include Amazon ECS and RackSpace Cloud.

Platform as a Service, PaaS: The service provider offers a platform that enables customers to create and execute their applications. The platform encompasses the development and execution environment for the application, together with supplementary services and the required technological infrastructure. The user lacks autonomy and authority in governing the various components of the platform infrastructure, except the application they install. (Yüksel, 2012). Examples of PaaS include Linux, Mac OS, Java, and Adobe AIR.

Software as a Service, SaaS: Users can access cloud computing apps from any internet-connected setting without installing the software on their own devices. Applications can be accessed using interfaces like web browsers and Web-based email from different user devices. Customers cannot oversee or govern components within the infrastructure, such as the network, server, operating system, and storage devices. Nevertheless, it is possible to configure program settings for each user (Yüksel, 2012). Examples of SaaS include Dropbox, Salesforce, and Google Apps.

1.2.2.6. Crypto Assets

Since 2018, the market for crypto assets has changed significantly. The massive increase in so-called “tokens” and the emergence of “stablecoins” to raise funds on existing platforms are particularly influential. These developments have forced regulators, standard-setting bodies, and legal experts to change their focus and broaden the term “cryptoassets”.

The term “cryptoassets” is currently used to refer to a wide range of assets. However, there is no widely agreed-upon definition for “cryptoasset”. Standard-setting bodies and regulatory authorities have adopted different definitions for monitoring and supervision or other purposes. In general, a crypto asset is a private digital asset. These private digital assets are recorded on a digital distributed ledger and are protected by encryption. A public authority or any central bank cannot issue them. Crypto asset holders can use them as a medium of exchange for investment and to access a good or service (Houben and Snyers, 2020).

Ryan (2021) defines eleven crypto asset classes. The descriptions are as follows (Ryan, 2021):

- Reserve Crypto Assets: This class includes assets that often underlie other crypto assets and are preferred before being converted from fiat currencies. Bitcoin and ether are prominent examples of this class and often account for a significant portion of market liquidity.
- Currencies: Cryptocurrencies are digital means of payment that allow units to be used in exchanges, store value, and perform calculations. The most well-known cryptocurrencies, such as Bitcoin, fall into this category.
- Platforms: Platforms enable the development of smart contracts and decentralised applications (DApps), including blockchains. This class includes platforms like Ethereum, which provides developers with many capabilities.
- Utility Tokens: These tokens enhance the browsing experience for a specific service and function.
- Governance Tokens: These tokens reward participation in managing a blockchain. Token holders can vote on protocol governance and make decisions. Token holders have the right to vote and decide on protocol governance.
- Security Tokens: Typically classified as capital, these tokens should be replaced if the exchange is subject to regulation. Sources of income, such as rent, interest, or shares, are often linked to the payments they intend to receive.
- Asset-Backed Tokens: These tokens depend on a specific asset in the blockchain, such as gold or real estate. As they have a digital representation of the asset, they can profit from it.

- **Crypto Commodities:** This digital currency represents a specific resource, such as processing power or storage space. It is usually applied to a specific industry and assessed based on resource supply and demand.
- **Application Coins:** These are designed to make a particular platform or helpful application. For example, the social media site Steemit is rewarding content creators with Steem tokens.
- **Non-Fungible Tokens (NFTs):** These tokens are commonly used in gaming, art, and collections, meaning different digital assets. Each NFT represents a unique digital asset and records ownership of that asset in the blockchain.
- **Stable Coins:** These crypto assets are designed to be pegged or indexed to a specific value. Some stablecoins, such as Tether, are pegged to a fiat currency (for example, the U.S. dollar), and their prices generally do not change based on this pegged value.

1.2.2.7. Internet of Things (IoT)

Kevin Ashton, one of the founders of the Auto-ID centre in 1999, introduced the concept of the ‘Internet of Things’ in a presentation for Procter & Gamble. This was the first time this term was used in the literature. The presentation proposed the adoption of applications that utilize devices communicating via radio frequency, specifically through radio-frequency identification (RFID) technology, in the company’s supply chain. It also highlighted the significant advantages this approach could bring to the company, painting a promising picture of the potential benefits of RFID technology (Agrawal and Das, 2011).

The Internet of Things technology connects various electronic devices, digital and mechanical machinery, items, animals, and even humans. These interconnected entities can generate and share information via the Internet. This system utilises a unique identification for each “thing”, enabling them to independently exchange data with one another and with central control mechanisms. Today, companies of various scales from nearly all sectors utilise diverse Internet of Things applications to enhance operational efficiency, streamline business processes, make informed decisions, and elevate the value of their business (Innova, 2021). Interconnected devices communicate using different protocols on the Internet of Things network. These devices build an intelligent network by connecting and sharing information (Turak, 2015).

It is used in different applications in many areas, such as health, transportation, agriculture, animal husbandry, industry, security, homes and buildings, emergencies, shopping, and logistics. Innovative environments, intelligent energy, smart agriculture, smart home, smart devices, and many other applications are the best examples of the Internet of Things.

1.2.2.8. Advanced Robotic Technologies

Robotics technologies combine various technical and scientific fields, including mechanical, electrical, and computer engineering. This matter is a field that incorporates multiple disciplines. Hence, to formulate plans and policies for robotics technologies, assessing them from a holistic and all-encompassing standpoint is imperative. Robotics and automation technologies are crucial for enhancing the competitiveness of the industry. The increased utilisation of robotics, assembly, robot systems, and industrial image processing systems allows for cost reduction in production and attaining high-quality standards. (UIB, 2017).

In the realm of marketing, customers seek rapid responses to their inquiries. In this dynamic and ever-evolving environment, businesses are integrating artificial intelligence systems to swiftly address customer demands and enhance agility in the supply chain. Businesses prefer robotic artificial intelligence-based machines and systems as they enhance organisational performance and contribute to the rapid advancement of systems. Robots replace hundreds of human resources in different organisations, providing business cost advantages (Panichayakorn and Jernsittiparsert, 2019). Various sectors have applied this technique for production purposes. Advanced robotic systems are more autonomous, flexible, and intelligent, capable of communicating, cooperating, and learning. This leads to a new generation of robotic systems (cobots-collaborative robots) (Koh et al., 2019).

Advancements in computing performance, numerically controlled manufacturing, electromechanical design tools, electrical energy storage, the Internet's scale and performance, electronic power efficiency, local wireless digital communications, and global data storage and computing power will lead to the development of more intelligent and self-sufficient robots (OECD, 2016).

As per Liu (2022), the technology underpinning the digital economy is a broad spectrum that encompasses information technology, particularly communication and computers and extends to technologies associated with the Internet, cloud computing, big data, the Internet of Things, robotics, and artificial intelligence. Despite variations in definitions, it is evident that critical technologies include computer and Internet information technology. Moreover, artificial intelligence and its derivative technologies, like blockchain and the Internet of Things, constitute pivotal components of the Fourth Industrial Revolution (Liu, 2022).

1.3. Securing the Digital Economy: Data Privacy, Trust, and Transparency

The diffusion of the digital economy proceeds in parallel with the diffusion of internet usage. As the ICT sector grows and its share in national income increases, the digital economy's importance for countries increases. With its advantages, many disadvantages, such as transparency, security, reliability, fairness, and control, are prevented, and economies are turning towards improvement efforts in these areas.

The perception of security has changed in the digitalised world. Cybersecurity is an essential concept in this respect. Cybersecurity is a terminology that is also used instead of information security (Solms and Niekerk, 2013). Cybersecurity is a complex problem that requires interdisciplinary judgment. Both for individuals using networks through telecommunication systems and for businesses and states with the increasing effect of Industry 4.0 and the Internet, cyber security is a subject of cyber security from a broad perspective. In this context, in terms of rights violations, different perspectives are needed for enterprises' production and management processes and the mechanisms used by states.

As technology and digitalisation are integrated into daily life and become widespread, they bring many problems despite their advantages. One primary problem arises from technologically based security vulnerabilities and digital traces left behind. All of these will expose users to many problems in the digital future.

In the information age, data is pollution, and it exists forever. Data pollution raises many privacy concerns because it can collect information about lost content without user consent (Schneier, 2009). In this case, users should be informed that information will always

be recovered online and may lead to undesirable places. This issue requires extensive multidisciplinary research considering education, law, technology, and other factors.

Data protection directives (95/46/EC) and Privacy and Electronic Communications directives (2002/58/CE) safeguard marketing practices. The basic principle of these directives is to enable users to make informed choices and to consent to monitoring using an "opt-in" mechanism. However, permission-based surveillance is an essential issue of consent. Understanding privacy rules is especially important because these rules are often long and difficult to understand (Cleff, 2007). Users should develop tools to help them make the right decisions to protect the privacy of their personal information and ensure their online security. These tools should inform users about the consequences and risks of their online activities as well as how they can protect themselves from situations like identity theft, by these tools.

Transparency in processing personal data is essential for society and individuals' privacy. A society in which citizens no longer know who knows what about them, when, and under what circumstances would be contrary to the right to informational self-determination. Therefore, most privacy laws, including EU Data Protection Directive 95/46/EC, adopt the principle of transparency to provide data holders with comprehensive information and access (Cleff, 2007).

With the advancement of communication technology, transparency is increasingly jeopardised, and therefore, tools to enhance transparency will become increasingly important. Transparency is a fundamental legal principle of confidentiality and a means to enhance trust. In this context, more work needs to be done on developing tools that provide user-friendly transparency of who processes data, how it is processed, and with what results. Ensuring transparency can also help to identify privacy violations by service providers, and in this way, they can be responsible for their actions.

Technology is constantly reshaping man and the world in a new dimension. In this context, digital awareness, coding training, algorithm information, and cyber security issues at the initial level and going through these stages by quoting from every stage of technology are essential. Therefore, individuals and societies with increased awareness can quickly adapt to new conditions.

2. DIGITAL ECONOMY AND TAXATION

The previous section delved into the transformative nature of digitalisation with Industry 4.0 and the conceptual framework of the digital economy. In this section, the tax dimension of the digital economy will be analysed. This is a topic of significant importance, as global tax regulations and studies on disruptions play a pivotal role in developing the digital economy.

Digitalization has emerged as one of the most critical developments in the economy since the Industrial Revolution, fostering growth and innovation. This shift has given rise to new business ideas and models while challenging taxation authorities, particularly at the national level. In the international tax system, enterprises and entrepreneurs generating income and value in multiple jurisdictions present significant dilemmas for the international tax regime (Georgieva et al., 2020).

The rapid advancements in ICT, the dissolution of geographical barriers, and the digitalisation of products and services have reshaped economic relations. This, in turn, has necessitated a reevaluation of legal arrangements for taxation. The surge in global trade has sparked numerous debates on how to tax those who earn income and profits through these new channels (Boccia and Leonardi, 2016).

While taxing the income and value-added generated by traditional businesses, traditional tax laws struggle to keep pace with the taxation of borderless businesses and enterprises arising from international trade. There is a consensus that the digital economy should be subject to existing general practices instead of making specific legal arrangements, both because of its global volume and openness to new business ideas (OECD, 2015).

Taxation of activities in the digital economy is still a new study. Despite the taxation problems that arise both at the global and national level, solutions continue to be produced. Many countries are looking for national solutions, but the most intensive and comprehensive work on the taxation of the digital economy is being done by the OECD and the EU.

2.1. Addressing the Tax Challenges of the Digital Economy

As a result of globalisation, digital economic activities are gradually developing, capital and investments easily change hands and mobility between countries increases.

Essential problems have arisen in the national and international arena regarding how taxation will be collected and the distribution method used.

Due to the globalisation and modernisation of trade, tax laws regulating how to tax trade cannot meet the demands and needs of the day. More than traditional tax laws are required to tax the activities of the digital economy resulting from globalisation. The intangible nature of the digital economy, coupled with its rapid and continuous evolution, significantly contributes to the emergence of these challenges. Specifically, the digital economy's flexibility and ability to swiftly adapt to changing conditions not only facilitate quick responses to tax policy changes but also pose significant challenges in terms of enforcement and regulation, leading to the development of tax avoidance strategies (Ault et al., 2014).

Digitalisation has created new challenges for indirect and direct taxes.

2.1.1. Challenges in terms of Direct Taxes

The emergence of new business models with the developments in ICT has made corporate and income tax issues, which are among the direct taxes, one of the current tax problems in global terms. With the developments in ICT, the decrease in the need for physical presence in commercial activities and the increase in the network effects created by customer interactions raise the problem of whether the existing rules are sufficient in determining the jurisdictions in tax terms (OECD, 2015).

According to the OECD, the location of the source of income where value creation occurs is the place of taxation jurisdiction. The country of residence refers to the country where effective administration takes place. This concept forms the foundation of all bilateral income tax treaties, which aim to prevent double taxation in the international economy. As per these treaties, the source country holds the primary right to tax income on a net income basis, with withholding tax applied to interest, intangible rights, and dividends. The resident country retains the authority to tax the income. However, it must mitigate double taxation by crediting the tax paid in the source country or granting an exemption from income tax. The source country must treat domestic and foreign enterprises equally according to the principle of non-discrimination. Whether there are value-creation enterprises, where they are created, developed, managed, or provided services, is still being determined. This scenario does not

occur in tax havens, where businesses often only establish shell companies (Hadzhieva, 2016). Transfer pricing lies at the heart of the international tax regime, as it hinges on distinguishing between residents and non-residents. Shifting income from residents to non-residents is the most straightforward method of evading residence-based taxation via transfer pricing (Avi-Yonah, 2007).

Regarding direct taxes, the tax challenges posed by the digital economy are categorized into three main areas: nexus, data, and income nature (characterization).

2.1.1.1. Nexus: Absence of A Permanent Establishment

In digital economies, unlike in traditional economies, there is no need for a fixed workplace or contact centre to conduct commercial activities. Commercial activities can be carried out effectively without a permanent workplace or contact centre. In this new situation, the inability to identify a permanent establishment or contact centre creates difficulties in determining which business the income belongs to (OECD, 2015).

The advancement of electronic transactions has significantly impacted taxation, particularly concerning the concept of the "workplace." Traditionally, tax systems were shaped around the notion of a fixed workplace before the widespread adoption of the Internet. However, with the emergence of the digital economy, this fundamental concept of tax law faces the risk of becoming obsolete. The digital economy has transitioned the exchange of goods and services from physical environments to the virtual realm through Internet networks. ICT have transformed the shape and processes of trade, with the pace of change continuing to accelerate (Işık, 2018).

The workplace concept has become inadequate for the taxation of the digital economy over time. As a result of the opportunities offered by the digital economy, taxpayers have organised their activities in a way that renders the definition of the workplace dysfunctional. This situation has caused problems both in international law and domestic law, as countries base their tax regulations on geographical dependence on a geographical location. In this context, the question of the fixed place of business has been one of the critical issues. The concept of a fixed place of business is in question for web stores without physical presence. In open markets, which have become more accessible due to digitalization, firms can expand their market shares without possessing physical or legal assets at the national level, thanks

to intangible assets and the internet. This enables them to generate income while operating outside the scope of taxation (Hadzhieva, 2016).

The term "permanent establishment" is defined in the first paragraph of Article 5 of the OECD Model Agreement as "a fixed place of business, through which the business of an enterprise is wholly or partly carried on". The paragraph defines "permanent establishment (PE)" as a fixed location where an enterprise conducts all or part of its business activities (OECD, 2017). A PE consists of three cumulative conditions. Accordingly, to constitute a fixed place of business (Sasseville and Skaar, 2010):

- There must be a "place of business".
- This place must be "fixed" (in spatial and temporal terms).
- "All or part of the business of the undertaking" must be carried out through the relevant place.

These qualifications require a more detailed examination due to their importance in the taxation of the digital economy.

Regarding the "place of business", firstly, there must be a "place" for a fixed place of business to be established. The non-resident enterprise must have a physical, tangible, three-dimensional existence and be in the source country (Holmes, 2014). The examples of PEs, such as offices, workshops, factories, oil wells, and mines mentioned in paragraph 2 of Article 5 of the OECD Model Agreement, reinforce the idea that only physical facilities can be considered fixed workplaces (Arnold, 2020). The requirement for a PE to be a "place" is interpreted as broadly as possible. In some cases, even the presence of a single object may be considered sufficient to constitute a PE. However, there has yet to be a consensus among countries. The PE's stability is analysed spatially (location-wise) and temporally (duration-wise). Spatial fixity refers to tangible assets connected with the source country's territory (Sasseville and Skaar, 2010).

Temporal stability requires that the workplace be permanent. This expression does not mean to continue indefinitely but to continue and will continue for an indefinite period. In the Commentary to Article 5 of the OECD Model Agreement, the OECD states that the practice followed by member countries, although not uniform, generally recognises the existence of PE, where a place of business has existed for more than six months. As a final condition, the fixed place of business must be where "all or part of the business of the

undertaking is carried out". This location requires the enterprise to conduct all or part of its core business activities. Generally, activities related to the enterprise's production, sales or management are related to the relevant enterprise's core business (OECD, 2017).

In 2013, the OECD and the Group of Twenty (G20) governments collaborated to support a 15-point Action Plan for Base Erosion and Profit Shifting (BEPS), aimed at tackling tax avoidance. The OECD's BEPS Action Plan No. 7 addresses the taxation of the digital economy, providing assessments and recommendations regarding deficiencies and necessary actions. It involves evaluating the deficiencies and providing recommendations for necessary actions. This move demonstrates that the current concept of "establishment", a crucial condition in taxes for nations, no longer adequately fulfils the need. This action aims to strengthen the standards used to identify a permanent establishment to prevent enterprises from deliberately evading workplace classification. To accomplish this, the OECD Model Tax Treaty proposes a modification to the concept of permanent establishment. The proposed revisions aim to include brokers and specific activities that are now exempt from being classified as permanent establishments within the definition of permanent establishment. Within this framework, countries should prepare for domestic law and tax treaties (Pinto, 2017).

Broadening the definition of permanent establishment and introducing the concept of taxable nexus is essential to accommodate a substantial digital presence (virtual permanent establishment) in various countries. An adequate tax nexus for a digital business in any jurisdiction should consider variables such as the user count, income earned, and the number of operating contracts held by the digital service provider. In an EU Member State, a significant digital presence (virtual permanent establishment) is acknowledged when one or more of the following criteria, as outlined by Ber (2018), are met:

- In a taxation period, the income provided to users in a member state exceeds EUR 7,000,000,
 - The number of users of digital services in a member state exceeds 100,000 in a taxation period,
 - The number of operating contracts for a digital service in a member state exceeds 3,000 in a taxation period,
- are counted as.

A fundamental challenge in taxing the digital economy lies in the inability to apply the notion of permanent establishment, as commonly used in traditional taxation, to enterprises functioning in the digital realm. Extensive studies have been undertaken to address this issue in both domestic and international legal frameworks. While these endeavours have shown improvement over time, they still need to catch up with the rapid adaption of the digital world. Hence, collaborative action is imperative to establish harmonised regulations for the taxation of the digital economy.

Due to the absence of a fixed place of business in the digital economy and the ease of relocating servers, the conventional concept of a fixed or connected place of business, which forms the basis of the international tax regime, and workplace-based taxation encounter significant challenges. Moreover, countries often struggle to assert authority to levy taxes on non-resident individuals and enterprises for direct taxes. Even when such authority is retained, the consistent recognition of the compulsory transfer of taxes imposed on non-resident taxpayers to the source country must be improved in practice. Difficulties experienced in taxation due to these and similar situations are considered within the scope of "nexus" (Budak, 2018).

2.1.1.2. Data: Increasing Information and Rapid Dissemination of Information in Virtual Environment

The progressive advancement of information technologies has facilitated remote information collection and utilisation for enterprises operating in the digital economy. Information is gathered directly from consumers, users, or other sources or indirectly through third parties. Enterprises utilise diverse strategies to get data. This may entail actively soliciting data from users and employing data analytics, or it may pertain to data predominantly owned by users, as observed in social networking or cloud computing, where the method is more responsive. Although data gathering has been a longstanding issue, advancements in processing power and the expansion of the internet have significantly enhanced the capacity to gather and categorise data. To effectively tackle the growing significance of data, it is essential to consider the potential consequences of conventional business models (OECD, 2015).

Beyond collecting, analysing, or classifying data, it is highly challenging to determine the value of raw data. The value of an entity's self-created intangible assets is generally not

recognised in the entity's balance sheet and, therefore, does not affect profit determinations. On the other hand, the data that the entity purchases externally may be included among the entity's assets or the data's value may be reflected in the entity's value so that a gain can be realised from the entity's sale. In cases where only the data is sold, its value can vary significantly based on the buyer's ability to analyse and leverage it (OECD, 2015).

Existing tax regulations for income allocation among different divisions of multinational enterprises necessitate an examination of the functions performed, assets utilised, and risks assumed. The growing importance of users in the tax context is determining where economic activities take place and creating value (OECD, 2015).

Given all these factors, the question arises about how to assign the value generated by data generation through digital products and services in the context of taxation.

2.1.1.3. Determining the Nature of Income

The emergence of innovative digital products and novel service delivery methods introduces uncertainties regarding the accurate characterisation of payments, particularly within evolving business models. The surge in technological advancements has spurred the diversification of digital products. With the growing array of digital products and the emergence of new ones, their deliveries occur through various digital platforms. Consequently, determining the nature of the income generated from these products becomes challenging (Pinto, 2017).

Digital technology has transformed the delivery of goods and services, introducing novel approaches to user engagement. Especially with the development of cloud computing, some problems have arisen in determining the nature of the income arising from these services. The total payment is made to the cloud computing entity in the contractual framework between consumers and cloud computing service providers, encompassing various sub-services delivered by multiple servers. The entities providing sub-services allocate the service fee among themselves based on the contract details. Thus, the revenues of the primary and sub-service owners and businesses providing each service can be determined. However, when one element, such as the sale or provision of services, serves as the primary focus of the contract, other elements, like sub-services, are deemed ancillary or incidental. In this case, the main element receives the entire amount paid in exchange for it.

(OECD, 2015). Although the rules for complex contracts are theoretically clear, it takes work to determine the main and auxiliary elements and thus allocate the taxation to these elements. At this point, the issue of whether the contract can be divided or not is essential. This is because if the service or sales transaction that constitutes the central element of a contract is subject to withholding tax at source, the auxiliary or other services provided under this contract will also be subject to withholding tax. If the contract is divisible, withholding tax liability will only apply to the pertinent portion of the consideration outlined in the contract (EY, 2015).

The nature of the income obtained from cloud computing services transactions must be analysed in detail to make the right decision. In making the assessment, particular attention should be paid to intellectual property rights and other rights to use the infrastructure necessary to provide the service. The income may be royalties, wages, or commercial (Shakow, 2013).

Taking advantage of the gaps and uncertainties created by these three elements, international businesses use methods with the main risks arising from direct taxation in the BEPS area to pay less tax. Some of the methods commonly used by these companies are as follows (Hadzhieva, 2016):

- Using preferential tax regimes: Multinational enterprises leverage multiple subsidiaries for marketing or technical support to expedite customer access to digital products. Consequently, subsidiaries pay fees for intangible rights, creating intellectual property rights and income (e.g., patents, trademarks, copyrights, licenses) in jurisdictions with lower tax rates and preferential tax regimes. Artificial insider trading in intangible assets: Profit shifting can be accomplished by manipulating management fees or licensing international properties.
- Disguised capital: A company is considered to have disguised capital when its equity capital is lower than the debts obtained from foreign sources. A firm can reduce risk at the local firm level by restricting capital. For instance, the local subsidiary of an online retail business might own a warehouse that generates profits within certain limits.
- Internal debt exchange: When one subsidiary owes a substantial sum to another, employing higher interest rates can diminish that subsidiary's tax base while simultaneously boosting the other's profits.

- **Transfer pricing manipulation:** Companies may overcharge for goods and services to artificially inflate the profitability or detriment of certain subsidiaries. This tactic may involve selling fictitious services, such as management or consultancy, to these subsidiaries.
- **Controlled foreign corporations:** These entities, typically situated in countries with low tax rates, are under stakeholders' control in different countries. Stringent regulations on controlled corporate profits are frequently crafted to counteract the hiding of profits by companies based in countries or regions with low tax rates. The main characteristic of such arrangements is that a certain proportion of the income attempted to be concealed in controlled foreign entities is attributed to the shareholder resident in the relevant country. In general, certain forms of income, such as dividends, royalty payments, and interest, fall under the jurisdiction of the legislation. However, complex hybrid structures such as double deduction, double non-taxation, and long-term deferral can be can be crafted to exploit favorable tax systems.

However, there are also difficulties regarding direct taxation's residence and source principle.

Regarding the residence principle: This idea involves imposing taxes on an individual's worldwide income within their country. Under this notion, the obligation extends to domestic and international income sources. The approach is based on the idea that individuals who benefit from public services should bear the financial burden of public expenditures (Wu, 1999).

The advancements and conveniences arising from the evolving technology have substantially contributed to the digital economy. Individuals can engage in international business operations without physically relocating from their current location. Hence, ascertaining the residency status of individuals engaged in these Internet commerce activities poses a challenge. Due to the need for a standardised worldwide tax system, issues emerge regarding the jurisdictional power for taxation among nations. Taxation based on the nation of residence becomes insignificant (Organ and Çavdar, 2012).

Electronic commerce involving the delivery of physical goods does not pose significant issues. Because physical goods are assessed and accrued at the place of delivery.

In international e-commerce, tax authorities impose taxes on physical goods as they pass through customs. However, there are challenges in taxing products like music, videos, and e-books, which are sold internationally through electronic commerce, as there is no tracking system for the delivery of goods. However, another issue pertains to the transfer of technology. Another challenge concerns technology transfers, which can manifest in diverse forms when moving from one country to another, encompassing leasing, licensing, or service provisioning. For instance, software and applications stored in software (on CD) can be delivered physically and online. In some countries, the ownership element may be counted; in others, it may not. The type of ownership, mode of transfer, and mode of payment can affect the tax treaty in technology transfer (Gerger and Gerçek, 2016).

Regarding the source principle: The principle of income source dictates that income should be taxed based on where it originates or is earned. In short, the target is not the person but the income. Typically, nations can tax the money generated within their territories. Currently, nations impose taxes on the earnings of their citizens, who are considered total taxpayers, and on the transactions that occur within their territories, irrespective of the individuals involved (Öz, 2004). The perceived insufficiency of the current definition of a fixed workplace and the challenges associated with its regulation are the primary factors contributing to the shift to this regime.

2.1.2. Challenges in terms of Indirect Taxes

Countries charge taxes on income, consumption, and wealth. Income taxes are the imposition of taxes on transferring goods or services to the consumer during the ultimate selling transaction. Consumption taxes are levied on the expenses incurred for consuming goods and services at delivery and provision. Income tax pertains to the imposition of taxes on the remaining income acquired by the taxpayer within a specific taxation period. Consumption taxes are the taxation of goods or services exchanged during the ultimate sale to the end user. Revenue taxes are levied based on the location where the revenue is generated, whereas excise taxes are imposed based on the location where the goods or services are consumed. Under the existing international taxation regulations, selling products through e-commerce and delivering them to a different country does not generate a taxable asset or contribute to the economic value of that country. Nevertheless, physical presence must be established to determine taxing jurisdiction. This detection can be done by

connecting to certain entities, such as an independent server. The extensive utilisation of 3-D printers has introduced unique challenges. The concept and approach of PE may not always function effectively for digital businesses that lack a physical presence and provide goods and services through a web page. The fact that the world has become an open market, the increase in intangible assets and the acceleration of access to the internet make it possible for businesses to reach the entire market without needing a physical presence and generate virtual profits (Hadzhieva, 2016). The OECD determines tax jurisdiction based on the location of income-generating sources. Nevertheless, the country of residence is identified as an enterprise's management seat. The taxation of activities in the digital economy is hampered by the lack of a fixed place of business and by double taxation avoidance agreements in this respect (OECD, 2015).

In response to the challenges created by taxation in an increasingly digital economy, nations have suggested or implemented indirect digital service taxes as a substitute for income tax and corporate income tax. These taxes effectively eliminate loopholes. The continuously expanding digital economy, mainly reliant on distance selling, threatens indirect tax revenues as it operates outside the international consumption tax system. In addition, goods and services pose problems because they are not physical but digital. Because physical products are easy to track and do not pose a problem for taxpayers and tax administration. However, since the activities carried out in the digital economy take place in the digital environment, it is difficult to track them, and problems arise regarding who will have the taxation authority (Millar, 2016). These challenges have grown exponentially since the beginning of digital economic business models. The proliferation of technology has dramatically enhanced the prevalence of online shopping and enabled firms to provide products or services to customers around the globe without the requirement of physical presence in the customer's nation. The OECD's BEPS Action Plans, specifically Action Plan No. 1 on the taxation of the digital economy, Action Plan No. 7 on the avoidance of establishment, and Action Plan No. 13 on country-by-country transfer pricing certification reports, encompass assessments and recommendations addressing shortcomings and proposed actions (OECD, 2015).

In indirect taxes, the application of Value Added Tax (VAT) presents significant hurdles. Cross-border trade in goods, services, and intangibles (including digital downloads), mainly when these items are acquired by private consumers from overseas suppliers, creates complexities for VAT systems. Additionally, digital economy taxation may create

challenges concerning stamp and customs duty. For instance, since digital products and services bypass customs procedures, they must either be exempt from taxation or require the transaction recipients to assume responsibility. These complexities highlight the intricacy of implementing VAT in the digital economy, a challenge that policymakers and tax professionals must grapple with.

2.1.2.1. The Challenges Encountered in the Implementation and Determination of Value-Added Tax (VAT)

When implemented through a progressive payment system, the VAT serves as a tax on final consumption and supports the fundamental principles of VAT in international trade. The primary concern in economic policy about the global VAT implementation revolves around using the country of origin or country of destination principle for tax collection. The destination principle considers only the ultimate consumption within its tax jurisdiction as the determining factor. According to the source principle, taxes are imposed in various jurisdictions based on where value is added. The destination principle ensures fair competition among enterprises within a jurisdiction, while the source principle guarantees equal treatment of customers across different jurisdictions. In contrast, the source principle ensures equal treatment of customers across various jurisdictions (OECD, 2017).

The VAT regulations governing the sale of goods and services in the digital economy exhibit flaws in their reasoning, causing countries to express apprehension over potential income declines. The rise and swift progress of e-commerce have presented the difficulty of establishing a legal framework for online transactions and VAT handling. Trading organisations that can conceal their true identities and virtualise their operations pose challenges for tax authorities in determining the extent and method of value-added tax collection, as it becomes arduous to differentiate their actual identities (Peng, 2016).

In its 2015 Final Report, the OECD addressed the main tax issues related to VAT in the digital economy (OECD, 2015):

- In several countries, imports of low-value goods from online sales are considered VAT-exempt and
- It is driven by strong growth in trade in services and intangibles (especially sales to private consumers).

As a result of the intricate nature of the VAT regulations for these types of goods, countries have challenges in either effectively collecting VAT or only managing to collect minimal amounts.

2.1.2.1.1. Digital products and VAT

Digital products have emerged as a new product group created by the digital economy. Products that are stored, used, and delivered in a digital format. Products are stored, delivered, and used in electronic form, which customers purchase online by logging into the website via email. In today's rapidly advancing technological world, the prevalence of intermediaries is a common feature in digital economy activities. Examining prevalent issues in the digital economy, such as indirect taxes like VAT on digital items and online purchases, is crucial. An extensive range of services is delivered electronically throughout the EU. Services provided over the Internet, or an electronic network are digital products (Chen, 2015). In addition, the European Commission has defined digital goods as follows: Digital products are products that are not physical and tangible goods, are provided through the Internet or an electronic network, are totally automated or involve minimal human intervention, are essentially based on information technologies, and do not exist without technology. These criteria are specific enough to include only digital products yet flexible enough to accommodate various innovations. Here are a few standard digital products available on the market today (Quaderno, 2018):

- Downloadable and online games,
- Buying a copy from Amazon (e-books, pictures) or using a service like Netflix (movies and videos),
- Purchase of MP3s, Cloud computing software and software as a service, Web sites, site hosting services and internet service providers.
- Digital products are also commonly referred to as “digital services”, “e-goods”, or “e-services,” all of which denote the same thing.

The EU VAT Implementing Regulation includes website hosting and remote maintenance of programs, software products and other digital goods. As of January 1, 2015, electronic services are taxed under the destination principle. For B2B products, taxation occurs where the customer receives the service, establishes its business, or has a fixed facility. On the other hand, in the B2C trade, VAT on services provided to non-tax residents

is paid when the customer has a permanent address or is usually a resident. The country of destination requires the principle of taxation to be implemented, which means that the delivery of goods and invoicing must comply with its VAT legislation (Bal and Gutierrez, 2015).

This practice requires suppliers of digital goods to be aware of the customer's tax status, determine whether the customer is taxable or tax-exempt, and, if the customer is tax-exempt, determine the location of the customer's domicile to accurately calculate VAT.

In contrast, cross-border B2B digital products are subject to a reverse charge system. This mechanism entails the transfer of VAT liability to the consumer. As a result, the supplier issues invoices without including VAT, and the customer is responsible for calculating and paying the applicable VAT to the tax authority in the jurisdiction where the consumption occurs. In the case of cross-border B2C digital goods supply, the supplier remits VAT in compliance with the One Stop Shop (OSS) or Mini One Stop Shop (MOSS) framework. The Mini One-Stop-Stop is a VAT system developed by the EU that allows suppliers selling/offering digital products to offer digital products within the EU without registering in each EU country (Quaderno, 2018).

MOSS is a system designed to ease the registration burden of companies offering digital services in EU member states. In the EU, the MOSS mechanism operates in two ways. The first is the scheme applicable to EU-established enterprises; the second is the scheme applicable to non-EU enterprises. Supplier businesses can register with MOSS from anywhere and can declare VAT electronically quarterly. This practice is optional, not mandatory. The VAT collected is transferred to the MOSS, and the MOSS unit transfers the VAT collected to the relevant countries. MOSS applications are a mechanism that enables suppliers to register, declare, and pay VAT at a single point/location, eliminating the need to pay, register, and declare VAT separately in each country where their customers are located (Turley et al., 2017).

Auditing enterprises within the scope of MOSS is one of the essential points in this regard. According to EU VAT legislation, audits are carried out by the Member State where consumption takes place. This problem may manifest itself more clearly in cases where a business offering digital products is subject to audit by multiple uncoordinated tax administrations in different countries. The primary objective of MOSS was to prevent VAT

losses and evasion related to radio-television broadcasting, telecommunication services, and electronically provided services offered by non-EU resident enterprises to non-EU taxpayers (Weidmann, 2015) However, even though the EU has reached a minimum level of harmonization with this practice, the problem of where, how and by whom VAT will be paid in the delivery of digital products from countries outside the EU to countries outside Europe is still essential.

2.1.2.1.2. Distance Sales and VAT

Another challenge to VAT collection stems from the robust expansion in the sale of cross-border services and intangible assets delivered remotely from B2C. Distance selling involves electronically selling goods or services to consumers in different locations without needing a physical presence in the consumer's country. This is common in the digital economy and includes the electronic sale of physical goods that require traditional delivery methods. The digital economy has facilitated global sales for sellers, allowing them to reach consumers worldwide through online platforms and electronic transactions. In this context, sellers are not required to be physically present in the consumer's country. The sale of such remote services and intangibles poses challenges to VAT systems. Countries can either not collect VAT or collect low amounts of VAT. It also creates potential competitive pressure on local businesses (OECD, 2015).

The application of VAT on distance sales is a complicated method that depends on the customer's location, the seller's turnover, and the specific rules of the Member State involved. For instance, when a taxable person residing in an EU Member State supplies goods from abroad, import treatment is applied (Bal and Gutierrez, 2015). In the EU, a special taxation regime for distance sales exists, which applies to goods dispatched or transported by a supplier in one Member State to a consumer in another. The place of taxation for these distance sales depends on the turnover generated by the supplier from such sales in the customer's country. VAT is charged according to the VAT legislation of the destination country when sales within that Member State surpass a specific threshold. The Member State where the goods originate taxes distance sales below this threshold. Suppliers also have the option to select the destination country as the place of taxation if the threshold is not exceeded (European Commission, 2016).

The challenge of VAT collection in distance sales is particularly burdensome for small and medium-sized enterprises. The obligation to register and calculate VAT in every state where distance selling occurs poses a significant administrative burden, often leading to a failure to adapt to the system. This is further complicated by the VAT exemption for low-priced consignments on imports, which allows EU customers to purchase goods from third countries without VAT. In contrast, goods of equivalent value from within the EU are subject to VAT. This exception for small quantities of shipments distorts competition, disadvantaging businesses within the EU (Bal and Gutierrez, 2015).

Despite the efforts and search for solutions by international organisations such as the EU and the OECD, there has yet to be a standard global solution on how and where the goods and services subject to digital exchanges will be taxed by which country. In addition to being very difficult to control, obtaining accurate and precise information about the transactions related to digital activities, their scope, and the persons performing them is challenging.

2.1.2.1.3. Digital Intermediaries, Double Taxation and VAT

The prevalence of one or more intermediaries in digital economy transactions relates to the complicated nature of digital services and the different roles intermediaries play in developing and delivering these services. Intermediaries can develop pre-existing services, offer them to their customers, and create a new service by combining multiple service requests. In intermediary structures, it is crucial to identify the primary seller who directly provides the service to the end consumer since the seller's responsibility is essential for the correct location of the person (seller) providing the service and applying the correct VAT rate. For instance, in cloud computing, those who provide services to the end consumer can be cloud computing brokers, cloud computing service providers, and even content developers (Bal and Gutierrez, 2015).

Private individuals predominantly acquire digital services through third-party platform providers (such as network sites, agents, and telecom service providers) rather than directly from the content provider. For instance, if a person who plays online games must pay €5 for further gaming services and use the easy payment service via mobile phone, the mobile phone operator will charge €5 to the person's phone bill. Suppose the mobile phone operator receives 1 EUR for its service, the payment facilitator 0.25 EURs and the game provider (seller) 3.75 EURs. In that case, many intermediate suppliers will be involved in the sale,

thus increasing the possibility of double taxation. Determining the place of taxation may be challenging when sellers and intermediaries operate in different EU countries or when one of the suppliers is located outside the EU. In a chain of sellers and intermediaries, the first party to charge VAT (according to EU legislation, until 2015, VAT was charged when a service was provided to a tax-exempt person) is likely to be the seller (the game provider), who will invoice the end consumers for the gaming service they provide (Næss -Schmidt et al., 2012). Second-party mobile operators will charge VAT on the amount due for gaming services and other services they offer to the final consumer. If the game server does not cooperate closely with telecom operators and charges VAT on the price paid for gaming services, there is a double taxation problem. This challenge becomes unavoidable if the seller and intermediaries are in different countries (Næss -Schmidt et al., 2012).

Double taxation can occur with digital intermediaries if one of the service providers is a non-EU resident entity. As per EU regulations, the non-EU seller must adhere to the destination rule. When a gaming provider in the US serves a tax-exempt end consumer in Germany through a payment facilitator in France, two distinct laws can be applied, which may result in a potential problem of double taxation. From the perspective of US businesses, a non-EU country provides gaming services to a tax-exempt EU citizen residing in Germany. Therefore, VAT will apply at the rate specified by German tax regulations. From the perspective of the French telecom operator, an EU-based business provides services to an EU citizen residing in Germany and tax-free. Therefore, by the relevant regulations (until 2015), VAT will be charged at the rate specified by French tax laws. This scenario results in double taxation for a single consumer paying VAT twice for the same service (Næss-Schmidt et al., 2012).

The rapid growth of the sharing economy has created various challenges, especially concerning the application and enforcement of VAT regulations. Most users do not pay VAT or file the required tax returns. Tax administrations are evaluating how to resolve this issue. In this context, the extent to which users and digital intermediaries are involved in the service provided, the scope of digital intermediaries' VAT liability, and whether digital intermediaries assist users in tax evasion are within the scope of the evaluation. Digital intermediaries must be well-versed in local legislation and actively collaborate with local tax administrations in multiple countries to effectively address these challenges (Aslam and Shah, 2017).

2.1.2.2. Customs Tax

The main problem with customs tax in the digital economy is that digital products are obtained directly by the consumer online without physical goods. Since countries do not include digital goods and service classification in their current customs tax legislation, problems arise in the taxation of digital products. For example, contrary to physical goods, games and programmes that can be discarded electronically are not included in the customs tax process (Organ and Çavdar, 2012).

In international tax regulations in the digital economy, tax administrations exclude services in e-commerce from customs duty tariffs by keeping them separate from physical goods. The OECD Model Tax Agreement on this issue has adopted the avoidance of customs duties on e-commerce when information and services are delivered electronically. In customs duty practice, this situation emerges as a legal gap in terms of taxation. As a consequence of advancements in the digital economy, it has become possible to purchase physical goods digitally, unlike traditional import methods. While a person who purchases a book, which is a physical product, from another country must pay customs duty for this good, he/she does not pay customs duty if he/she purchases the same book as an e-book through digital means. Therefore, this legal gap causes customs duty problems in the digital economy. It causes tax loss by distorting competition and equality in trade (Clinton and Gore, 1999).

2.1.2.3. Stamp Duty

Stamp tax is a type of tax levied on documents and papers. In other words, the primary conditions for realising the tax are paper and documents. The papers subject to stamp duty are decisions, contracts, receipts, and papers used in commercial transactions. Tax administrations issue contracts for electronically purchasing goods and services made in the digital environment. While these contracts concluded electronically are legally accepted, the absence of a paper drawn up or signed does not attract tax as it is not considered a transaction involving stamp duty (Mert and Bayar, 2020).

2.1.3. Tax Challenges in Digital Economic Business Models

The digital economy encompasses various activities, including electronic commerce, web-based advertising, cloud computing systems, online and mobile app stores, 3D printing technology, and the taxation of crypto assets. These activities are observed to pose dangers in terms of taxation and result in tax income reduction for countries.

2.1.3.1. Taxation of E-Commerce: Problems and Possible Solutions

With the transition from the industrial society to the information society, developments in digitalisation have led to new business models and products. In this new era, the existing tax regulations, primarily designed for physical assets and transactions, need to be revised to address the complexities introduced by digitalisation. Electronic commerce, as the predominant economic extension of the information society, has brought forth various challenges in taxation. The surge of e-commerce has given rise to numerous challenges within the taxation domain, necessitating a reevaluation of existing frameworks. Since the legal infrastructure and tax systems are created according to the structure and characteristics of traditional trade, they cannot fully grasp e-commerce, which is a new concept.

The rise of international taxation challenges, exacerbated by e-commerce, has not only highlighted the inadequacies of current tax regulations but has also heightened the risks of tax evasion and avoidance, thanks to the dissolution of geographical boundaries. We can list the issues encountered in the taxation of e-commerce as follows (Basu, 2008):

- E-commerce has paved the way for organisations operating in national markets to open to international markets. These organisations, which have opened to the international market, have faced different tax legislation due to their transactions, and this has caused tax problems.
- The inherent nature of e-commerce, involving remote operations through web servers, poses challenges in resolving taxation issues. When digital shoppers refrain from making declarations, tax authorities and third parties encounter difficulties in obtaining information about the shoppers. This information gap contributes to challenges within the current tax system, which relies on residence and identity information.

- Some of the products in the digital economy do not have physical delivery. Since digital products do not pass through border customs, their nature and structure cannot be determined, which poses a problem in taxation.
- With e-commerce, it has become possible to establish businesses non-physically. In this case, problems arise, such as deducting some expenses arising from the physical existence of businesses from the tax base or decreasing the depreciation of intangible digital business products.
- The changing location of web providers involved in e-commerce and the physical location of organisations, individuals, or servers complicates the determination of the commercial activity's location.
- It is a separate issue whether the foreign customers businesses host on their websites are also tax-liable.
- There is also no clarity on information and communication infrastructure's international and national competitiveness.

Both countries and the OECD have proposed solutions to these problems in e-commerce. Instead of relying solely on national solutions, addressing these issues through collective decisions made by international organisations like the OECD is crucial. In increasingly globalised commercial transactions, the scope of e-commerce is also expanding; therefore, more than national regulations are needed. In some instances, relying solely on national regulations may give rise to new challenges rather than resolving ones. International settlement arrangements are more effective in responding to problems arising in e-commerce. While countries are not obligated to adhere to these regulations, they endeavour to do so, considering their interests and benefits (Hardesty, 2002). On a national level, public administrations should work in partnership and in parallel with international remedy arrangements to avoid falling behind in an evolving and changing world. Instead of adhering to these regulations, certain governments may resort to restrictive or burdensome measures, leading to challenges such as internet access difficulties or high prices. This harms the country's development. In developed countries, we see the opposite. Practices that encourage digital economic activities expand the tax base and create an environment for taxing e-commerce with the widespread use of the Internet (OECD, 2001).

Efforts to address the challenges arising in e-commerce taxation can be categorized into the following four headings:

- According to the erosion of the tax base approach proposed by Doernberg (2000), if the payer can gain tax advantages in his/her home country, taxation should be withheld on this payment. However, this approach only covers payments between organisations and does not include payments made by individual consumers. Proponents of this approach argue that it provides convenience for tax administration and taxpayers regarding source determination and income characterisation. According to this approach, payments made abroad are sufficient for withholding tax, and it is not essential to determine the income element of the payment (Doernberg, 2000)
- Taxation of electronic transactions through an "ICT Tax" without considering their commercial nature and importance: The "ICT Tax", which is proposed as an indirect tax for the taxation of e-commerce, envisages the taxation of the information utilised for sales rather than the taxation of products and services, and the tax base of this tax will be formed within the scope of the data sent. Such a tax application will cause the problem of taxing commercial activities carried out in an electronic environment and electronic transactions used for communication purposes. The "ICT Tax" could be considered a special e-commerce tax instead of stamp duty only for activities performed through e-notaries. However, in line with the current views, the "ICT Tax" develops based on levying a tax on each bit sent through the internet. However, the "ICT Tax" aims to eliminate the taxation inequity between e-commerce and traditional trade (Chan, 2000).
- With physical and geographical presence diminishing in relevance to digital trade, it has been suggested that the source country's "economic threshold" should be determined to exercise its taxation authority. Therefore, the total sales revenue generated by a non-resident enterprise in a country reflects the enterprise's economic presence in that country. Enterprises that do not make sales at a certain level should not be taxed, but those that make sales above a certain level should be taxed by withholding tax. In this system, enterprises can be subject to real method tax by filing a declaration in the country where they earn their income. If the withholding tax rate is high, this encourages non-resident enterprises to file returns (Avi-Yonah, 1997).
- Another suggestion is to apportion income taxes among countries according to a formula. This approach aims to avoid transfer pricing problems and rules. Musgrave (1984) stated that formulae can be "supply-based" or "supply and demand-based".

Supply-based formulae consider only the factors of the production process in generating income, while supply and demand-based formulae include the effects of the market. Some federal states, such as the United States and Canada, apply the formula-based apportionment method at the state level (Musgrave, 1984).

Solution suggestions of international organisations to the issues linked to the taxation of e-commerce are briefly as follows:

OECD: Studies carried out at the OECD conferences have determined the taxation principles that must be followed in the taxation of electronic commerce. Recommendations have been presented for revenue administrations to implement these principles in their practices (OECD, 2001).

The World Trade Organization (WTO): The WTO, adopting a perspective grounded in the foundational principle of free trade, has refrained from overtly articulating its stance on the taxation of e-commerce, choosing instead to delegate primacy in this domain to other pertinent international organisations (Westin, 2000). The “Geneva Ministerial Declaration on Global E-commerce” of 1998 marked the inaugural elucidation of viewpoints. In alignment with the perspective asserting that global e-commerce activities engender novel and emergent opportunities for trade, the United Nations declared, both in the “Geneva Ministerial Declaration” and reiterated in the subsequent Doha Ministerial Declaration of 2001, the exemption of customs duties on e-commerce transactions. Certain nations opposed this decision based on apprehensions regarding the potential diminution of tax revenue. Conversely, proponents contended that such a determination was judicious, positing it to further bolster the principles of free trade (WTO, 2001).

European Union (EU): The EU adheres to Ottawa's decisions concerning e-commerce, covering indirect and direct taxes while concurrently developing its regulations and proposals. The EU Commission has entrusted the Taxation Policy Group with investigating indirect taxes at the Union level, collaborating with the OECD on an international scale. The EU's inaugural expression of its viewpoints on the taxation of e-commerce occurred in the document “European Initiative on E-Commerce”, published in 1997 (Schulze et al., 2001). This document posits that e-commerce is not expected to impact direct taxes substantially. However, acknowledging the dynamic nature of the landscape, the EU has actively

participated in formulating necessary arrangements, particularly within the Value Added Tax (VAT) system, about the taxation of e-commerce.

Within this scope, the EU has implemented partial yet pivotal changes to the VAT system, referred to as the “community tax”, explicitly emphasising the taxation rules applicable to cross-border sales. Consequently, in transactions involving the sale of digital goods from non-EU Member States to individual consumers residing in EU Member States or entities exempt from VAT, the seller must establish VAT liability in the Member State where the sale occurs. Conversely, if the sale targets a VAT-liable commercial enterprise, establishing VAT liability is waived, placing the responsibility for tax calculation and remittance squarely on the buyer.

2.1.3.2. Taxation of Online Application Stores

The proliferation of technological tools has resulted in a surge in the use of online applications. The tax status, which refers to the legal classification of a transaction for tax purposes, of commercial transactions involving these applications is influenced by various factors. These include the applications' characteristics, such as whether they are used on devices like tablets and smartphones, whether they are paid, and whether they offer benefits to users who purchase them. Additionally, the location of the purchasing user or the organisation making the sale can also impact the transaction's tax status (European Commission, 2016).

An increasing number of online app stores may utilise “tax avoidance” strategies, a practice that raises serious concerns. These strategies aim to exempt the revenue they earn from taxation in the country where the sales occur and where their companies are based. The OECD's BEPS Action Plan seeks to tackle the problem of tax erosion and profit shifting. Diverse recommendations are put forward to address this issue, classified as actions to be undertaken by the host country, actions relevant to both the host and parent company's home countries and actions applicable solely to the parent company's home country (OECD, 2015).

2.1.3.3. Taxation of Web-Based Advertising

Web-based advertising, a crucial segment of the digital economy, primarily relies on social networks, media applications, email providers, and mobile applications. The web-

based advertising ecosystem comprises different entities: web publishers, who embed advertisements into their online content in exchange for payment; advertisers create ads for display within the web publisher's content; and ad network intermediaries facilitate connections between web publishers and advertisers seeking their services (OECD, 2014).

Digital advertising publishers enhance web-based advertising by employing techniques such as monitoring consumer responses to ads, tracking brand impact on customers, devising more captivating approaches for potential customers, and conducting thorough analyses. The web-based advertising industry is the only business that can be accurately measured and assessed. Online advertisements are software applications that offer brand managers valuable insights into the return on investment, enable immediate intervention in the advertising presentation process, and gather individual preferences as data. Web-based advertising is a cost-effective and efficient method that provides precise targeting compared to other advertising platforms. It also allows for prompt feedback on users' requests (Eurostat, 2018).

Entrepreneurial groups have resorted to various methods, aware of the popularity of online platforms. The following are these methods: (Özen and Sari, 2008):

- Pay Per Click (PPC) refers to the cost per click. Website owners earn a commission for each click on the advertisements displayed on their site.
- Google AdSense: Developed by Google, this method involves providing a service to increase the dissemination of advertisements on its search pages.
- Banner Exchange: When a website places the code from any banner exchange site on its pages, it will display ads from other sites on the web page, and vice versa. Examples include Troy, Mastercard, and Visa advertisements on online sales sites.
- Membership Method with Shopping Sites: This strategy entails displaying the advertisements of websites that wish to promote their products on the website. The transaction generates a commission by clicking on any of these links and completing a purchase. Notable instances of this approach encompass Hepsiburada.com and trendyol.com, which are particularly prevalent on social networking platforms.
- Rental Advertising Spaces: In this method, advertisers typically prefer sites with many visitors and a wide range of potential users. For instance, a company may pay

a certain amount in exchange for displaying its advertisements on popular blog sites.

With the transition of commerce to the electronic environment, the challenge of taxing income from online advertising also arises. There are debates on the definition of establishment and agreements to prevent double taxation. The widely accepted approach in international law is based on the principles of individuality and property. Economic transactions must be conducted in the workplace to tax income from an activity. However, the source country criterion is insufficient in taxing income from e-commerce. Debates continue about whether websites and computer servers should be considered workplaces in e-commerce. The new opportunities provided by ICT have led companies to countries where they can gain advantages. The definition of workplace in tax laws, organised according to traditional trade rules, is insufficient to respond to innovations in the developing world (Fuchs, 2018).

The workplace interpretation of the OECD Model Tax Treaty states that the server must be in another country to be considered a workplace in that country. In other words, if foreign companies do not have an internet server in a country, a workplace cannot be considered to exist within the framework of international agreements. In this case, it is only possible to consider advertisements from the Internet as commercial income and tax them if foreign institutions have a workplace in that country. As a result, international agreements are stipulated to have the force of law. In a dispute between these international agreements and laws, the provisions of the international agreement will stay. The double taxation avoidance agreement (DTAA) shall be evaluated within this scope, and international agreements shall prioritise applying tax laws. However, how the source state will treat income that is not subject to taxation according to the DTAA needs to be clearly defined (OECD, 2020b).

Advertising activities in the digital economy have become significant and expansive worldwide, generating substantial income within a sizable market. Governments aim to tax this substantial source of income. However, like other aspects, several challenges are associated with taxing digital advertising. While a definitive and fully optimal solution has yet to be found, global and domestic actors are taking some steps. Some countries pursue national solutions, while others explore global solutions through institutionalisation. Will the ongoing search for solutions keep pace with the dynamics of the digital economy?

2.1.3.4. Taxation of Cloud Computing

Another challenge in taxing the digital economy relates explicitly to the nature of income generated, especially in the context of cloud computing services. Cloud computing is the sharing and storing of information, data, and resources over the Internet (Oredo and Njihia, 2014). In addition to seeking more reliable services at lower prices, companies have found managing the increasing user and data load challenging. Consequently, in recent years, many companies have adopted strategies to migrate their data storage and computing operations to the cloud (Leka, 2022). Introduces innovative business models and effects that transcend national borders, as evidenced by the increasing prevalence of cloud-based transactions. In some areas of some countries, there is even legislation exempting these services from taxation (Vertex, 2022).

Taxation processes become crucial when companies align their operations with the cloud or transform to cloud-based operations (KPMG, 2015). Incorporating a tax function into the cloud strategy allows companies to be more financially prudent, reduce complexity, and better anticipate and manage risks (Deloitte, 2020).

Cloud computing consists of three primary services, namely service delivery. The taxation of these services and the problems that arise are as follows (Misra and Mondal, 2011):

- **Taxation of Infrastructure as a Service (IaaS):** In the taxation of Infrastructure as a Service, a key consideration is defining the taxable entity as a service, which requires clarification. Typically, providing this service involves significant upfront costs for purchasing hardware and equipment. As a result, substantial expenses and numerous items may require deduction from the tax base. In the case of Infrastructure as a Service, payments are made on a month-to-month basis without the need for infrastructure investment. Consequently, individuals or institutions providing Infrastructure as a Service will be subject to income tax, corporate tax, and VAT.
- **Taxation of Platform as a Service (PaaS):** IaaS's primary advantage lies in avoiding labour, equipment, and know-how costs for developing the infrastructure. In return, the service recipient reaps the benefits offered by the platform through regular monthly payments. The issued invoice triggers corporate tax and VAT obligations

for the organization providing the platform. When considering a specialized taxation regime, it becomes evident that determining the taxation of the Platform as a Service (PaaS) business model is considerably more intricate compared to the IaaS model.

- Taxation of Software as a Service (SaaS): The specific part of the taxation of software products as a service is determining whether the provisions regarding the delivery of software will be applied. In the taxation of software as a service, it is necessary to mention income tax if the service provider is a natural person, corporate tax if it is a legal entity, and VAT in both cases.

The advantages of cloud computing, such as unlimited storage space and low software and hardware costs, make it an attractive option. In this system, users can actively participate in a country's economy without establishing a physical workplace, without being subject to the legislation of any specific country, and without the need for a material or physical presence, including the employment of staff. However, while this circumstance is advantageous for some, it poses a significant challenge for tax authorities due to the inability of current regulations in many countries struggle to keep up with the pace of the digital economy (Subashini and Kavitha, 2011).

In trading transactions within cloud computing systems, expenditures are incurred, and gains are obtained in return for these expenditures. This circumstance triggers a taxable event. However, since cloud computing lacks a physical existence, taxation becomes problematic. The extensive use of cloud computing nationally and globally makes addressing its taxation increasingly crucial.

2.1.3.5. Taxation of Crypto Assets

Various definitions use the qualities, elements, and technological characteristics of “crypto assets”. In these definitions, qualities and elements of crypto assets such as "distributed ledger technology", "digitally created and stored", "distributed over digital networks", "expressing value or rights", and "intangible rights other than cash" are commonly used. According to the OECD's report on the Taxation of Cryptocurrencies published on October 14, 2020, a significant portion of crypto assets is characterised as cryptocurrencies (OECD, 2020b).

The volume of the economy created by crypto assets is eleven billion dollars in 24 hours on only one stock exchange, making it a priority for governments (Coin Market Cap, 2023). While crypto assets are generally used for payment, credit, investment, and value storage purposes, users have started to use them frequently in daily transactions.

Identification of the crypto asset owner is another problem when taxing these assets. As a rule, ownership of crypto assets, which typically resides in a crypto asset wallet, is anonymous. If individuals link themselves to a crypto asset exchange through their identity, their identity on the blockchain can be identified (GDF, 2018).

The OECD's publication "Taxation of Virtual Currencies: Tax Approach and Emerging Tax Policy Challenges" states that "crypto assets and especially virtual currencies are developing rapidly, and tax policymakers are still in the early stages of assessing these assets".

The main tax challenges in the taxation of crypto assets are listed as follows (OECD, 2020b):

- How should income from crypto assets be handled in terms of both indirect and direct taxes?
- If these assets are considered wealth, how should the crypto asset inventory be included in the scope of countries' wealth or capital gains taxation?
- How should the VAT system regulate the taxation of the production, purchase, ownership, and transfer of these assets?
- How can tax evasion threats and other financial crimes induced by crypto assets be efficiently detected and handled, including the existing legislative framework and capabilities available to governments, tax administrations, and financial crime investigators?
- How should tax transparency be improved, including the information tax administrations should have about these transactions to ensure tax compliance?
- Given the dangers associated with tax compliance, what measures should be taken to promote tax transparency and effective reporting and sharing of information regarding crypto assets?

The exclusion of "crypto financial asset" information from the automatic exchange of financial account data poses a significant challenge in combating tax evasion and financial

crime. Specific details on which types of financial account information are not included in the automatic exchange are essential for a clearer picture.

While many countries permit using cryptocurrencies to purchase goods and services, their legal status varies. Countries often emphasise the risks of this use but do not explicitly state that using cryptoassets is illegal. They implicitly or explicitly recognise the legal status of cryptocurrencies through the publication of taxation guidelines. According to the OECD publication, countries recognise crypto financial assets as intangible assets, commodities, virtual commodities, money, legal tender, financial instruments, or assets (GDF, 2018).

With an economic size exceeding trillions of dollars, crypto assets are attracting the attention of nations. In this context, the taxation of these assets becomes a crucial issue. However, it is noteworthy that there has yet to be a universal consensus on the global definition of crypto assets. While some countries tend to categorise crypto assets as currencies, others prefer to treat them as property or securities, and some have opted for an outright ban. At the international level, a clear legal framework for the taxation of crypto assets has yet to be established. In some countries, there needs to be more legal regulation on this matter. Instead, certain nations prefer to augment their existing tax systems and incorporate various tax types, including income tax, corporate tax, capital gains tax, and digital gains tax, to regulate the taxation of crypto asset transactions (Doğanay and Odabaş, 2022).

Within the framework of these approaches, the direct taxable event arises from the creation or purchase and sale of cryptocurrencies. Virtual currencies created by crypto mining are subject to taxation in several jurisdictions. For individuals and organisations, income from these currencies is valued according to market value. Regarding indirect taxes such as VAT, it isn't easy to establish the taxable event in buying and selling virtual currency, which differs depending on the country. The European Court of Justice has determined that transactions involving the exchange of a currency for virtual currencies, or vice versa, should be free from VAT according to the EU VAT Directive. This exemption is due to difficulties determining the calculated and deducted VAT of virtual currencies, like national currencies, as their primary purpose is a medium of exchange (European Commission, 2019).

2.2. International Studies and Sample Country Practices

In this section, the efforts of leading international organisations such as the OECD, the EU, the WTO, and the UN, as well as the efforts of some sample countries to seek unilateral solutions in the taxation of the digital economy, will be examined.

2.2.1. OECD Studies

2.2.1.1. Turku Conference: Dismantling the Barriers to Global Electronic Commerce

The conference, held in Turku, Finland, in November 1997, was organized in cooperation with OECD member countries, Finland, Japan, the EU, and the Business and Industry Advisory Committee (BIAC). The aim and roles of the participants could be clarified for better context, providing information on the conference's purpose or the roles of its participants. As an outcome of the meetings, it was highlighted that issues such as the taxation of e-commerce, protection of personal data, security, intellectual and industrial rights, pornography, protection of children, protection of consumers, and cryptography were discussed (OECD,1998).

The Turku Conference aims to identify issues of trust and taxation in e-commerce. In this context, the conference focused on the first report of the OECD's Committee on Fiscal Affairs (CFA), titled "Electronic Commerce: Challenges for Tax Administrations and Taxpayers". The results of this report can be listed as follows:

- The OECD is identified as an appropriate forum for addressing e-commerce issues.
- The OECD's core interest lies in online transactions with individual consumers, particularly regarding digital products, content, and services.
- Workplace issues should be examined in detail within the context of e-commerce.
- The Internet may offer tax evasion opportunities to wider groups of taxpayers by eliminating the drawbacks of distance trading and reducing costs.
- The place of consumption should be the basis for VAT, and this point could be further clarified by explaining why it is crucial or how it should be implemented.
- Neutrality between electronic and non-electronic transactions should be maintained.

- Tax administrations should have equal access to confidential information online and offline.
- There is a need for greater mutual international cooperation between tax administrations to enforce tax laws better.

The conference had two significant outcomes. Firstly, the taxation of e-commerce should be simplified, and the introduced system should ensure taxpayers' voluntary compliance. Additionally, traditional trade should neither artificially favour nor disadvantage e-commerce, and the advancement of e-commerce should be supported. Another significant outcome was the consensus that no single state acting alone could solve these problems. Consequently, the approach of recognizing the OECD as the competent organization for addressing tax problems was adopted.

2.2.1.2. Ottawa Ministerial Conference

The Ottawa Conference on the taxation of e-commerce, titled “A World without Borders-Realising the Potential of Electronic Commerce”, took place in October 1998, shortly after the Turku conference. During this conference, the CFA issued a declaration outlining the framework conditions for taxation. This declaration was well-received by both ministers and the business community (OECD, 2001).

In 1997, ministers at the Ottawa Conference endorsed the framework principles developed by the CFA in response to the challenges identified at the Turku Conference to guide the taxation of e-commerce. These principles represent an international consensus. Participants recognised them as a reference point for developing tax proposals and measuring their appropriateness. The principles endorsed include efficiency, neutrality, effectiveness and fairness, clarity and simplicity, flexibility, and equity, which are available in the previous sections of this paper. By adopting these principles, OECD member countries recognise that the international taxation regime guiding traditional trade also applies to e-commerce. This approach stems from the notion that existing taxation norms can function at the current level of technological and commercialisation (Yalti, 2003).

In addition to the principles adopted at the Ottawa Conference, participants endorsed an action plan for e-commerce. The OECD commits to applying the following clauses to

ensure effective collaboration with regional and international organisations, businesses, and non-member countries properly (OECD, 1998):

- Staying informed about technical, protocol, and standards developments and providing input where necessary to maintain the harmonised functioning of tax systems,
- Making additional interpretations of international taxation norms, when necessary,
- Guiding adapting existing rules and administrative practices to respond to future developments in e-commerce.

During the conference, OECD Ministers, the OECD Business and Industry Advisory Committee (BIAC), the OECD Trade Union Advisory Committee (TUAC), and other private sector organisations reached the following conclusions (OECD, 1998):

- E-commerce, with its unique methods compared to traditional trade, is recognised as a potential driver for economic growth and a contributor to global development.
- Policies for e-commerce should be formulated to facilitate its development on a global scale, promoting international cooperation and communication while ensuring fair competition.
- Governments are encouraged to create an environment conducive to competition, eliminate or reduce trade barriers, and protect the public interest in both the digital and physical worlds.
- Government intervention, when necessary, should be appropriate, consistent, transparent, predictable, and technologically neutral.
- Recognising the importance of business collaboration in ongoing standard-setting, governments should encourage international, voluntary, and consensual efforts in operating e-commerce.
- Businesses should maintain a key role in addressing challenges related to e-commerce, ensuring constant cooperation with governments and other stakeholders while considering the public interest and economic and social objectives.

2.2.1.3. OECD/G20 BEPS Project

While the OECD's work on taxation practices dates to the past, the most comprehensive and influential work on the taxation of the digital economy is the 2015 Final

Report. Through the OECD, countries seek to agree on non-binding legal norms to overcome gaps in taxing jurisdiction. The OECD's attempt to address this issue has been its work on preventing international tax avoidance, which it calls "Base Erosion and Profit Shifting (BEPS)".

BEPS, a term coined by the OECD in 2016, refers to profit shifting through tax base erosion. The OECD defines it as "tax planning strategies that exploit gaps and inconsistencies in tax regulations to artificially shift profits from economic activity to tax-free zones with little or no tax rates."

The report prepared and presented by the OECD aims to present the problems related to BEPS in an unbiased and detailed manner. In this direction, the report includes data and studies on the existence and magnitude of BEPS. In addition, the OECD has proposed in the report that transparency should be increased to tax transnational corporations effectively. For this purpose, an action plan is required to define the main problems and their solutions. The same year, the OECD prepared an "Action Plan" of 15 actions (OECD, 2013).

After extensive research and deliberation, the BEPS Action Plan, a comprehensive set of 15 action plans, was unanimously approved by all countries at the G20 summit in Antalya in 2015. This approval, highlighting the global consensus on the necessity for tax reform, incorporates the most significant changes and recommendations in the international tax regime. The action plans are structured around three key themes: enhancing the consistency of tax rules across borders, reinforcing substantive requirements, and augmenting transparency and certainty.

2.2.1.3.1. BEPS Actions by Theme

Beps Action 1: Addressing the Tax Challenges of the Digital Economy

As a result of the significant erosion of the tax base caused by the activities carried out in the electronic environment, Title 1 of the BEPS Action Plan published by the OECD is related to the taxation of the Digital Economy. This title includes answers to questions such as determining the tax liability in the digital economy, determining the type of income generated, the tax regime to be applied, and how taxes on expenditures such as VAT should

be levied (PwC, 2017). BEPS seeks to address questions posed by the digital economy: Where does economic activity take place, and where is economic value generated?

The final report on this action plan was published in 2015. Accordingly, the problem must be analysed by considering the digital economy's links with other action plans. The most essential deficiency identified in this context is the absence of a defined digital workplace. The definition of the digital workplace, considering preparatory and auxiliary activities, is necessary for determining the taxation authority and preventing double taxation. In this context, policymakers should make necessary arrangements in double taxation avoidance agreements. Stakeholders handle direct and indirect taxation holistically, envisioning various options. In addition, the Action Plan again emphasises the principles of the primacy of harmonisation and transparency that tax systems should have, which were also accepted at the Ottawa Conference on the taxation of the digital economy (OECD, 2015).

Coherence

Four of the fifteen items in the Action Report are related to the consistency principle. These are briefly as follows (OECD, 2015):

Action 2: Counteracting the impacts of hybrid mismatch arrangements: The most typical example is when one country treats a debt as a loan, and another country treats it as capital. While the country that treats the interest expense as a loan can deduct it from tax, the country that treats it as capital exempts it from tax as dividend income. The report provides best practices for resolving these disputes internationally.

Action 3: The aim is to standardise and strengthen the rules on CFC income. The controlling country taxes the income of subsidiaries with passive income and CFC income, provided that certain conditions are met.

Action 4: This action plan should limit the financial expenses that companies can recognise as expenses to a fixed rate or group rate.

Action 5: This action plan analyses harmful tax practices that provide anti-competitive tax incentives and supplies for automatically exchanging important tax rulings and information between countries.

Substance

Articles 6,7,8,9 and 10 in the Action Report are related to the substance principle. These are briefly as follows (OECD, 2015):

Action 6: It aims to develop anti-abuse rules that strengthen the prevention of using tax treaties only to provide tax incentives (i.e., treaty shopping) even if they do not reflect the actual state of the transaction.

Action 7, 8, 9, 10: The reports resulting from these action plans revise the OECD Transfer Pricing Guidelines. In summary, the scope of these revisions is a factor to be considered in the pricing of low-value services and commodities and the assessment of intangible rights.

Transparency

The remaining items in the Action Report are related to the principle of transparency. These are briefly as follows (OECD, 2015):

Action 11: The eleventh action plan emphasises measuring the tax loss caused by BEPS.

Action 12: The action plan requires multinational enterprises to declare their aggressive tax planning before the transaction to measure BEPS and make risk assessments in advance.

Action 13: This action plan organises transfer pricing documentation under three headings: framework reporting, local reporting and country-by-country reporting.

Action 14: The action plan, which is related to dispute settlement, aims to make good faith and minimum commitments under the mutual agreement procedures in the countries' tax treaties to prevent double taxation arising from different interpretations of the laws.

Action 15: This action plan aims to make such changes through a single multilateral agreement, which would require the conclusion of double taxation avoidance agreements under other action plans but which would be impractical.

2.2.1.3.2. BEPS Inclusive Framework

The BEPS Inclusive Framework, established in 2016, allows interested countries, including emerging economies, to develop standards for BEPS-related issues. With one hundred thirty-four member countries, it aims to address challenges in international taxation. In March 2018, the OECD released an interim report recognizing the unique challenge posed by the digital economy. It identified three approaches: targeted changes to nexus and profit allocation rules, broader solutions encompassing challenges beyond the digital economy, and maintaining existing rules deemed effective following the BEPS project. The OECD endorsed a work program to find a global solution to digital economy taxation by 2020, reflecting a broader international effort to tackle this issue (Rukundo, 2020).

2.2.1.3.3. BEPS Actions Minimum Standards

The BEPS Inclusive Framework, a global collaborative effort, introduces four Minimum Standards. These Standards, four of the fifteen Actions of the BEPS Project developed by the OECD, aim to enhance transparency and information exchange (Joshi, 2020). The four minimum standards, which need to be implemented, include combating harmful tax practices and the exchange of specials (Action 5), preventing the abuse of treaties (Action 6), re-examining transfer pricing documentation, including country-by-country reporting (Action 13), and strengthening dispute resolution (Action 14). The content of the fifteen Actions was determined by the OECD, G20, and OECD member countries (the BEPS 44 group). However, countries outside this group are also encouraged to participate in implementing the four Minimum Standards. As of June 2020, one hundred and thirty-seven countries have committed to implementing these Minimum Standards (OECD, 2019).

The BEPS 4 Minimum Standards mandate comprehensive regulations to be integrated into countries' domestic and treaty laws within the BEPS Inclusive Framework. As a result, participating countries must amend tax treaties and align domestic laws with these standards. For instance, at the national level, countries have (Valderrama, 2020):

- Revised their preferential tax regimes to eliminate harmful features
- Implemented rules to ensure the automatic exchange of rulings
- Enforced requirements for reporting transfer pricing documentation

- Enacted rules to facilitate tax dispute resolution.

2.2.1.3.4. BEPS 2.0: Pillar One and Pillar Two

In January 2019, a two-pillar study was produced, which includes several recommendations against digitalisation-related tax issues and other BEPS situations. Although the working papers, each exceeding 200 pages, contain information and assessments at a high technical level, countries continue to discuss many of the issues and recommendations in the reports.

On October 8, 2021, at the OECD meeting, participants agreed on the critical elements of the study on the taxation of the digital economy based on two main pillars and the relevant declaration was published on the same date. One hundred forty-one countries participating in the BEPS 2.0 project endorsed it in December 2021. (OECD, 2021). Pillar One concerns the new nexus and profit allocation rules to allocate a larger share of taxation rights to global business income to market countries. Pillar Two sets a minimum corporate income tax to resolve remaining BEPS issues. The 2023 deadline has been extended until June 2024 (U.S. Department of the Treasury, 2024). In addition, in February 2024, the minimum corporate tax ruling envisaged in Pillar Two came into force in some non-European countries and many EU countries.

Under Pillar One, multinational enterprises with consolidated revenues above EUR 20 billion, pre-tax profitability above 10% and operating in all sectors except finance or mining will be taxed. The "nexus" approach will tax these enterprises in market countries. With the implementation of Pillar One, revenue taxed in certain countries will be shifted to other countries, and the distribution of tax revenues will change. In this phase, changes will be made to the taxation of large technology companies. Some tax revenues will be shifted from the countries where these companies operate to those where they sell products or services. However, the advantage of underdeveloped and developing countries in attracting foreign direct investments may decrease due to the 15% global minimum corporate tax. This may cause countries to consider new incentive policies. The draft emphasises that Pillar One should eliminate digital service taxes and similar policies. The US Trade Representative has met with some countries with digital service taxes to ensure this transition. Otherwise, countries may need to draft new laws and eliminate conflicting policies (KPMG, 2023).

Pillar Two aims for a global minimum tax rate of 15%. Companies with a consolidated turnover of EUR 750 million or more will be subject to this rule and will be subject to a global minimum tax rate. This would generate an additional tax revenue of USD 150 billion. The US intends to implement a global minimum corporate tax of 15%. It has stated that taxes paid in countries where the 15% global minimum corporate tax is not applied will not be deductible in the US (KPMG, 2023). This practice forces all countries to implement the global minimum corporate tax rate.

With the implementation of a global minimum corporate tax, multinational companies may be prevented from moving their earnings to countries with low tax rates. This would be realised by applying similar tax rates worldwide, and the attractiveness of tax haven countries would decrease. However, tax haven countries should ratify the agreement for this implementation to be successful.

2.2.1.3.5. Criticism Against the BEPS Action Plan

The BEPS Project has faced severe criticisms from various angles. These include capital flight to developed countries, confusion caused by differences in BEPS implementations, double taxation, disputes, and compliance burdens. These criticisms underscore the potential challenges and drawbacks of the project.

Economic activities will shift from tax havens to developed countries with the effective implementation of the action plans. Regions that attract investment only due to tax advantages will risk losing the capital they have collected to developed countries when they lose this advantage. Although this is the primary purpose of the Action Plans for Combating BEPS, one criticism is the concern that this project, designed with the influence of developed countries, will only be implemented with the needs of developing countries. Implementation differences lie at the heart of the confusion, double taxation and dispute risk related to the Action Plans. The possibility of country administrations needing to fully understand the Action Plans, some implementing them before others and some interpreting them in line with the BEPS Challenge Package despite local legislation, may lead to confusion and disputes between taxpayers and tax administrations. This circumstance may lead to inconsistency in international tax practice. Even the measurement of the estimated tax loss due to BEPS is based entirely on some assumptions (Diclehan, 2016).

2.2.2. European Commission Studies

The digital economy is evolving, developing, and advancing to new dimensions each day worldwide. Many institutions and organizations formulate regulations and action plans to extend their influence and offer practical solutions. The EU is also crafting multiple action plans to eliminate barriers to cross-border digital economic activities. This initiative commenced in 2000 with the Lisbon Strategy and continued with the Europe 2020 Strategy, unveiled in 2010. These plans present roadmaps for the EU to optimize the benefits of ICT in innovation, economic growth, and employment. The EU outlines detailed roadmaps within the scope of these strategies to harness the advantages of digitalization in fields such as employment, economic growth, and innovation (Akses, 2015).

2.2.2.1. European Union Digital Single Market

The report compiled by the proficient personnel of the European Commission regarding the taxation problems encountered in the digital economy asserts that Europe reaps manifold benefits and prospects from the digital economy. The Europe 2020 Strategy prioritised the conversion of the EU into an information society and highlighted the significance of creating a Digital Single Market within the EU (Akses, 2015). To create a unified market within the region, the European Commission adopted the concept of a “digital single market”. It acknowledged the significance of taxation rules among EU countries, companies, and consumers. Additionally, according to the members of the expert commission, in the digital economy, issues such as tax avoidance and tax evasion are less likely to be encountered, making it more effective to combat these problems and reduce administrative costs. Consequently, experts believe that an efficient and effective tax tracking-collection system can be established, fostering a tax system that encourages entrepreneurship. In this context, the EU has made several decisions and implemented various practices (Gülhan and Turunç, 2015).

The Digital Single Market strategy aims to ensure the free movement of goods, services, capital, and persons in Europe and the free movement of “data”, which is now a new element. In this way, an infrastructure will be created where individuals and businesses in EU Member States can easily access online goods and services regardless of their country of citizenship. On May 6, 2015, the European Commission announced the Digital Single

Market Strategy, which consists of three main chapters and sixteen different actions. Its three main headings are as follows (European Commission, 2017a):

- Better access to digital products and services for consumers and businesses in the EU,
- Ensure a level playing field for the advancement of digital networks and innovative services,
- Supporting the growth prospect of the digital economy.

This strategic plan aims to enhance accessibility to digital products and services for consumers and enterprises inside the EU. The main objectives are to establish the necessary conditions for developing digital networks and innovative services, promote the growth potential of the digital economy, and ensure widespread economic expansion throughout all regions of the EU. The details under these main headings are as follows (Akses, 2015):

Better Access to Digital Products and Services for Consumers and Businesses in the EU: This initiative seeks to enhance accessibility to online products and services across Europe, targeting businesses and consumers. Addressing global impediments that hinder online activities is imperative to achieve this goal. Specifically, the priority objectives encompass eliminating extant disparities in copyright and contract laws among EU Member States, minimising the costs associated with VAT and parcel services, fostering consumer confidence in online transactions, implementing measures to counteract geographical restrictions, and establishing a novel framework for e-commerce. The European Commission envisages future measures, particularly regarding geographical barriers, e-commerce, copyright, and VAT.

Ensuring equitable opportunities for the development of digital networks and innovative services: The EU aims to provide a suitable home environment for digital services by developing a secure, high-speed, and reliable infrastructure and services within the digital market. The telecommunications sector is undergoing profound structural changes due to the swift evolution of digital technologies. Notably, challenges persist regarding investments in rural areas and regulatory frameworks, highlighting the need for comprehensive legal regulations. Additionally, the sector grapples with inadequacies related to the swift evolution of technologies and emerging market needs, particularly in the audio and visual media domain in the early 21st century. In this context, the European Commission should establish

legislative arrangements to ensure strategic investments in digital networks and take initiatives to develop advanced infrastructures. Another critical dimension pertains to online platforms, including social media, app stores, and search engines, which play pivotal roles in economic and social spheres. The influence of these platforms over online markets raises concerns, particularly regarding protecting personal information. Consequently, addressing cybersecurity issues becomes imperative (Artar, 2018).

Supporting the Growth Potential of the Digital Economy: For the EU to sustain international competitiveness, the pervasive adoption of advanced digital technologies across all sectors of its economy is imperative. Conversely, European companies currently underutilise these technologies. To address this discrepancy, the European Commission strategically targets incentives to encourage companies and society to harness the full potential of digital technologies.

The European Commission, as the driving force behind the Digital Single Market, has implemented the regulation on the Single Market in Digital Services, known as the “Digital Services Act”, in the EU as of August 25, 2023. This comprehensive law covers essential internet service providers and all online platforms, setting rules for removing illegal content online, obligations for significant platforms to take risk-based action, transparency measures, protection of minors and new rules on traceability of commercial users. With the law's entry into force, significant platforms and search engines operating in the EU have become obliged to comply with new rules on data collection, privacy, disinformation and hate speech. With this regulation, the EU aims to create a single regulatory framework for digital services, ensuring a smoother market functioning and providing citizens with a safe online experience (European Commission, 2024).

2.2.2.2. Mini One Stop Shop

The Mini One Stop Shop (MOSS), an electronic registration and payment system, came into effect on January 1, 2015, and was designed to streamline the procurement regulations and VAT obligations for businesses engaged in telecommunications, broadcasting, and electronically provided services across EU countries (Popa, 2016). Within this framework, the MOSS system, an electronic registration and payment mechanism, has been introduced, encompassing the taxation of electronically provided services and any physical goods purchased online, both within and outside the EU (Hadzhieva, 2016). Under

the MOSS system, VAT is levied based on the location of the buyer rather than the seller. Sellers can register with MOSS in any EU member state, electronically declare VAT quarterly, and remit the collected VAT to MOSS, which then electronically distributes the funds to the relevant countries. Sellers, not MOSS members, must independently declare and remit VAT directly to the relevant country quarterly (European Commission, 2019).

The “taxation at the place of consumption” practice embedded in MOSS prevents businesses from circumventing taxes or engaging in tax optimization by exploiting varying tax rates in different countries, thereby mitigating the detrimental impact of tax competition among nations (Artar, 2019).

2.2.2.3. Digital Service Tax Proposal

The European Commission has proposed a temporary revenue-based digital service tax of 3% targeting revenues generated through monetising user input. This approach encompasses not only user data but also the enhancement in service value stemming from network effects driven by active and ongoing user engagement. Under this scheme, the tax would qualify as a deductible expense for multinational enterprises when calculating corporate income tax in the EU. The proposal seeks to grant greater taxation rights to source EU Member States where multinational companies have a digital presence and provide services in the source country but whose profits are taxed only at the companies' headquarters.

Under this proposal, for services that utilize user data for advertising or data sales, the place of supply will be determined by the location of the advertisement or where the users providing the data are situated. Similarly, for services that provide digital platforms or marketplaces to users, the place of supply will be where the user pays for access to the platform or conducts transactions within it. This approach grants taxation rights to the EU country where the user is situated, irrespective of their direct contribution to the multinational enterprise's revenue. This is because activities performed by the user, such as viewing advertisements, inherently hold value, irrespective of whether the user pays for the service. Entities to be taxed must meet two criteria (Walker and Collins, 2021):

(1) The entity must generate total worldwide revenues of over €750 million in a financial year.

(2) The total amount of taxable income generated by the entity within the EU must exceed €50 million.

Table 1. Digital Service Tax in Some Selected Countries

Country	Rate (revenue being the base)	Threshold	Effective date
Austria	5%	€750 million global income and €25 million for domestic companies	January 2020
France	3%	€750 million global income and €25 million for domestic companies	July 2019
Italy	3%	€750 million for global revenue and €5.5 million for domestic income	January 2020
Malaysia	6%	RM500,000 in 12 months (estimated US\$105,000)	January 2020
Poland	1.5%	-	July 2020
United Kingdom	2%	£500 million in global incomes and £25 million in domestic revenue	April 2020
Türkiye	7.5%	€750 million global revenue and TRY 20 million for domestic incomes	March 2020

Source: Mpofu, 2022, p.6.

Digital service taxes seek to tax the value created in the digital economy (Mpofu and Moloji, 2022). To date, Fifteen European countries have implemented digital service taxes.

2.2.2.4. Other Studies of the European Union

The “Digital Single Market”, a key initiative to strengthen the “European Single Market”, underscores the crucial role of taxation as a link among member states, businesses, and consumers within the EU (Centore and Sutich, 2014). The European Commission Expert Group on Taxation of the Digital Economy has identified three key areas within the context of BEPS, namely harmful tax competition (Action 5), transfer pricing rules (Actions 8-10), and provisions related to taxable relationships (permanent establishment) (Action 7).

The EU’s unwavering commitment to fairness in taxation is evident in its pledge to strengthen the enforcement of patent box regulations as a component of the BEPS Action Plan. The European Commission has proposed using its tools, such as state aid and codes of conduct, to counteract member states’ aggressive tax planning or administrative practices to

attract foreign direct investment. The consequential “Anti-Tax Avoidance Package” is a significant step in this direction, representing the Commission’s comprehensive efforts towards achieving more equitable, straightforward, and effectual corporate taxation in the EU. It includes tangible measurements to prevent aggressive tax planning, improve tax transparency, and establish an equitable playing field for all companies operating in the EU. The package is a collective initiative for Member States to take robust and coordinated action against tax evasion, ensuring companies contribute taxes wherever they earn profits in the EU (Centore and Sutich, 2014).

In October 2016, the EU Commission unveiled its plan to reshape corporate taxation in the Single Market, aspiring to establish a corporate tax system that is both fair and conducive to growth. Regarding corporate tax reforms, the revised “Common Consolidated Corporate Tax Base” is anticipated to streamline and reduce the cost of business operations in the EU while acting as a potent tool wielded by the EU to combat tax evasion (European Commission, 2016).

A “VAT Action Plan” has been formulated to address VAT-related tax challenges. On April 7, 2016, the EU Commission introduced the VAT Action Plan, a pivotal step towards creating a comprehensive EU VAT Area to combat evasion, support businesses, and contend with the challenges of the digital economy and e-commerce (European Commission, 2016). In October 2017, the Commission launched the EU’s “Single VAT Area” plan. This initiative, brimming with potential, aims to modernize and improve the VAT system for governments and businesses, fostering a system that enables European companies to capitalize on the Single Market's advantages and maintain their competitiveness in the global market. The new EU Single VAT Area is grounded in four fundamental principles (European Commission, 2017b):

- Fighting fraud: VAT will now be levied on cross-border company trade. The prevailing practice, where this type of trade is exempt from VAT, is susceptible to abuse by unscrupulous companies, leading to the receipt of VAT payments without subsequent remittance to tax authorities.
- One Stop Shop/Store (OSS): The One Stop Shop aims to streamline VAT processes for companies engaged in cross-border sales. It facilitates the declaration and payment of VAT in the trader’s language through a unified online portal, employing the same rules and administrative forms as in their home country. Member States

can then directly remit the collected VAT payments to one another, like the current practice for e-service sales.

- Greater consistency: The transition to the “destination” principle is integral, ensuring that the final VAT amount is remitted to the Member State of the ultimate consumer. This principle, already in effect for e-service sales, will now be fully extended to all transactions, enhancing the uniformity of the VAT system.
- Less bureaucracy: Invoicing rules will be simplified, allowing sellers to adhere to the invoicing norms of their home country even when engaged in cross-border trade. Businesses will be relieved of the obligation to prepare and declare a list of cross-border transactions for submission to tax authorities.

2.2.3. World Trade Organization (WTO) Studies

The WTO is an international organization that facilitates the groundwork for diplomatic negotiations among nations concerning foreign trade. It establishes rules governing international trade, evaluates national trade laws, and endeavours to address foreign trade issues among its member countries (TR Ministry of Culture and Tourism, 2022).

The WTO's objectives and trade-related plans, as succinctly articulated by Karluk (2003), encompass the following facets:

- Enhancing the standard of living, fostering employment, and consistently augmenting real income and demand. This circumstance involves enhancing production and trade in goods and services and developing available resources to address diverse needs and concerns.
- Ensuring that underdeveloped and developing countries secure a proportionate share in global trade commensurate with their requirements for economic development.
- Establishing mutually advantageous agreements that promote tariff and trade barrier reductions while eradicating discriminatory practices in global trade.
- Safeguarding the core principles of the multilateral trading system.

The WTO is a party to international agreements concerning the digital economy, specifically the General Agreement on Trade in Services (GATS) and the Trade-Related

Aspects of Intellectual Property Rights (TRIPS). The former, GATS, facilitates liberalization in ICT services, which constitute the infrastructure of e-commerce. The latter, TRIPS, is designed to safeguard intellectual property (Canpolat, 2001). In this context, as Welfens and Weske (2007) suggested, the WTO is recommended to establish appropriate trade rules, particularly for digital goods and services. The existing regulations on digital services, governed by the GATS, need to be revised. Thus, there is a need for a more robust regulatory framework in this domain. Fostering international cooperation is crucial to reforming national tax laws and promoting an environment conducive to long-term investment. The OECD can actively contribute to this effort as a platform to address taxation issues (Welfens and Weske, 2007).

As the WTO's 2020 report outlined, fostering international cooperation is pivotal in enhancing the efficacy of digital development and technological innovation, concurrently mitigating adverse effects stemming from nationally established policies. In this context, international cooperation alleviates trade tensions and promotes more efficient functioning of international markets. The 2021 report underscores the imperative for trade to be more inclusive and predictable, contributing to economic resilience and fostering diversification. The WTO assumes a central role in fortifying economies by advocating for reduced trade barriers and more transparent trade policies (Canpolat, 2001).

2.2.4. United Nations (UN) Studies

The United Nations (UN) studies many issues through its organisations regarding developing telecommunication infrastructure and information technologies for underdeveloped and developing countries.

The UN works on the digital economy through the UNCTAD. UNCTAD aims to guide countries with official data from the field of digital economy and contribute to developing countries. In this context, UNCTAD's activities are as follows (UNCTAD, 2018):

- Research, methodological guidance, and technical assistance,
- Information gathering,
- Building partnerships (consensus).

UNCTAD provides the support mentioned above for countries that want to measure and evaluate the digital economy with a few questions. In terms of measurement and evaluation, we can list the questions as follows (UNCTAD, 2018):

- What is the size of the ICT sector?
- To what extent do companies of different sizes use the ICT space?
- What is the value of national and international e-commerce sales?
- What is the share of the amount and value of services exports in digital services in total services exports?
- Which country is the largest importer and exporter of different digital goods or services?
- How can countries better develop gender-based ICT indicators?

Considering these questions, UNCTAD provides countries with methodological guidance and technical support. Regarding data collection, UNCTAD collects and disseminates official statistics and information on issues such as companies' use of ICT, trade in ICT goods or services, and the size of the ICT sector (UNCTAD, 2021).

UNCTAD aims to create an international consensus, and for this purpose, it organises many meetings and studies on the statistical information needs of member countries, especially developed and developing countries, together with expert groups. Looking at all these studies, the UN has generally focused on understanding the definition of the digital economy, its benefits and harms for developing countries, and new business models in the digital economy. A comprehensive study on digital economy taxation needs to be conducted (Artar, 2019).

In terms of direct and indirect taxes, the multifaceted business models, and highly mobile intangible assets in the digital economy challenge countries' tax systems. Due to all the difficulties experienced in the digital economy, countries and international institutions and organisations have sought solutions. Due to the failure to reach a common international consensus, countries have enacted unilateral Digital Service Tax (DST) practices regarding taxation problems.

2.2.5. Country Case Studies on Taxation of the Digital Economy

The studies of some countries on the taxation of the digital economy are as follows:

2.2.5.1. United States of America (USA)

The US Tax Cuts and Jobs Act (TCJA) of 2017 constituted the most extensive overhaul of the US tax code since the Tax Reform Act of 1986. The corporate sector generally sees most TCJA provisions as favourable, but amendments have been made. The BEPS-inspired provisions are as follows (Altenburger and Czajkowski, 2020):

- **Global Intangible Low Taxed Income (GILTI):** Under the TCJA, a new tax has been introduced on GILTI earned by foreign subsidiaries. GILTI is designed to capture the excess return on a foreign subsidiary's intellectual property, which is calculated based on a certain proportion of these entities' net income. A 10.5% tax is imposed on this income (a higher rate will be applicable from 2026).
- **A Base Erosion and Anti-Abuse Tax (BEAT):** This provision is essentially a minimum tax on “base erosion payments” by multinational companies. To fall under the content of BEAT, the annual turnover of the international company operating in the US must exceed USD 500 million for three years. The payments made in return for delivering goods and services to the entity operating in a different country with a partnership relationship must be 3% or more of the total expenses. BEAT is triggered when the essential erosion payments reach a certain percentage.
- **Hybrid Non-Compliance:** The TCJA also includes provisions targeting hybrid mismatches. In this context, it introduced new rules for situations where certain payments are not included in income or may be deducted. In addition, the participation exemption does not apply to dividends received by a US shareholder from a CFC, such as hybrid dividends. These provisions neutralise hybrid mismatches arising from deduction/non-deduction and double deductions. These regulations aim to prevent practices such as profit shifting and tax evasion.

2.2.5.2. United Kingdom (UK)

The United Kingdom took steps towards taxation of the digital economy in 2015. In this scope, the "Shifted Gains Tax" was introduced. The basis of this tax is to prevent the diversion of profits, which leads to tax evasion or avoidance by keeping the profits outside the United Kingdom. It applies at a rate of 25% on diverted profits. It applies at a rate of 55% for companies in the oil and gas sector. The Diverted Profit Tax is not limited to companies selling online. It applies to any company that operates in the UK and is a taxpayer.

Under the new rules, the UK holds online marketplaces responsible for unpaid VAT caused by overseas sellers who do not have PE status. All overseas sellers are mandated to designate a UK sales representative. This regulation, implemented to oversee and register sellers, resulted in a tenfold surge in VAT registration applications from overseas sellers in 2016. In 2017, new VAT regulations were enforced, necessitating sellers to prominently display their VAT registration numbers on their online marketplaces (Hadzhieva, 2016).

Another step towards taxing the digital economy in the UK is the Digital Service Tax. The main question for businesses in this tax is whether their income is covered. In this context, the tax only applies to "online services". In this context, as of April 1, 2020, it has been decided to levy a 2% Digital Service Tax on the income of large multinational companies from specified online services. With this step, the UK has determined that many large companies, especially Google, Facebook, and Amazon, which do not pay tax on their earnings, will be included in the scope of tax, and a turnover threshold of £ 500 million for global revenues and £ 25 million for revenues within the UK to protect start-up companies (Alliston, 2020).

2.2.5.3. India

India has pioneered the implementation of tax measures aimed at the digital economy. One such measure is the "Equalisation Tax", which is 6% of the price paid for online advertising services provided by non-residents. This tax was introduced in 2016 and aims to ensure that non-resident providers of online advertising services are subject to taxation in India.

The "Equalisation Tax" is the Indian government's response to the issues raised in the "BEPS Action 1 Report", which addresses tax challenges arising from the digital economy. India proposes to levy a tax on the digital transfer of goods and services produced by technology or internet-based companies to users in India (Jones et al., 2018). However, as of 2020, it has been decided to apply 2% to the revenues of e-commerce operators and suppliers. This decision is part of India's ongoing efforts to ensure that digital transactions are subject to taxation.

2.2.5.4. Japan

Like other countries, Japan has taken various steps to tax the digital economy. One such step is the “Japanese Consumption Tax”, a tax on digital goods purchased from suppliers outside Japan. This tax, enacted in 2015, is part of Japan's strategy to classify foreign companies that do business without a physical presence on its territory but store and distribute goods in Japan as a permanent establishment in Japan. With this tax, offshore digital content providers that distribute digital products to consumers in Japan must register, file returns, and make payments to the Japanese tax authorities. The Japanese consumption tax rate applied to the digital economy's taxation was 10% (Bunn, 2020).



3. REGULATIONS ON DIGITAL ECONOMY IN TURKISH TAX LAW

The impact of the digital economy on all societies in the global world, the efforts of international organisations, especially the OECD and the EU, to identify and tax the problems related to the digital environment, and Türkiye, which is a member of the OECD on the one hand and a full member of the EU on the other hand, has become an obligation to keep up with all these developments. In this context, there are several legal arrangements to harmonise the OECD and EU studies on the taxation of the digital economy, together with the studies carried out to improve digital economic activities and regulations on protecting personal data.

In this context, regulations on strengthening the digital infrastructure, protecting personal data and taxing the digital economy will be analysed under two headings.

3.1. Regulations on Strengthening Digital Infrastructure and Protection of Personal Data

Significant developments in ICT, especially in the last thirty years, have led to unexpected results and the benefits they provide. Thus, new concepts and definitions such as internet, access, content provider, and service provider have emerged in all areas of law. New concepts and new areas have also led to new problems in the field of law that cannot be solved with the old system and legislation and are different from the previous ones. Due to their nature, information technologies and the goods and services offered within this scope affect the regulations/rules applied by countries and the entire international community. For this reason, today's countries and international organisations are trying to keep up with this new environment that is developing at a dizzying pace by cooperating in this field. To solve the problems arising in this context, several legal arrangements have been made both in the EU member countries and in other countries that are not members of the Union.

In general studies on the taxation of the digital economy, it has been stated that countries should carry out studies in this direction and take the necessary measures. Due to the global dimension of the issue, countries should make legislative arrangements based on international organisations' decisions. In this context, Türkiye has made critical legislative arrangements regarding strengthening digital infrastructure and protecting personal data.

As part of harmonization efforts with the EU, the “Electronic Communication Law”, numbered 5809, was enacted to address the problems brought about by developing technology. This legislation aims to foster effective competition within the electronic communications sector through regulation and oversight, safeguard consumer rights, extend services nationwide, optimize resource utilization, promote technological advancements, and attract new investments in communication infrastructure, networks, and services. Additionally, it delineates the procedures and principles governing these objectives. Article 4 of the Law No. 5809 defines the basic principles of the Law No. 5809. The Law covers activities such as providing electronic communication services, establishing infrastructure, producing, and importing devices, frequency allocation, and regulation.

With the Directive 2000/31/EC dated June 8, 2000, the EU has bestowed specific responsibilities upon its member states in providing services within the realm of the information society. These responsibilities encompass provisions related to general information obligations, requisites for commercial communications, regulations concerning unsolicited electronic communications, rules governing contracts concluded by electronic means, and pre-contractual information obligations. Furthermore, member states are tasked with delineating the responsibilities and rules of professional conduct applicable to intermediary service providers. Regulations have been enacted in Turkish law to address legal challenges arising from information society services. These regulations, spanning different dates, include Law No. 5651, which regulates internet broadcasts and addresses crimes committed through these broadcasts, and Electronic Signature Law No. 5070.

Additionally, Law No. 4077 on Consumer Protection, incorporating provisions pertinent to information society services, came into effect in 2014. This legislation introduced novel provisions concerning contract formation, distance contracts, and other aspects complemented by the Turkish Code of Obligations No. 6098. The Draft Law on the Regulation of Electronic Commerce, embodied in Law No. 6563, endeavours to fortify the e-commerce infrastructure and achieve harmonization with the EU. The legislation aims to regulate two overarching areas. The first pertains to obligations related to electronic contracts, encompassing obligations to provide information and obligations for service providers. The former seeks to ensure that recipients of electronic services can readily identify the goods or services intended for purchase, mitigating the risk of misleading information. The latter obliges the parties to make the contract subsequently accessible and allows for the rectification of errors. The second area addresses unsolicited electronic mail.

Law No. 6563 covers regulations related to commercial communication, the duties of service providers and intermediary service providers, contracts made through electronic communication tools, requirements to provide information about e-commerce, and the penalties to be enforced. Commercial communication is any communication associated with e-commerce undertaken to gain profit within the purview of professional or commercial activities, excluding domain names and electronic mail addresses. As delineated by Law No. 6563, the concept of e-commerce emerges as a broader construct than the definition provided by the OECD in this field. Individuals or entities engaged in e-commerce activities are called “service providers”. In contrast, those offering the e-commerce infrastructure for executing economic and commercial activities on behalf of others are termed “intermediary service providers” (Biyani, 2014).

The Regulation on Service Providers and Intermediary Service Providers in Electronic Commerce, implemented in line with Law No. 6563, includes a comprehensive range of regulations. The primary purpose of this rule is to specify the protocols and principles that service providers and intermediate service providers must adhere to protect the general information on the e-commerce platform. Additionally, it seeks to govern the information that service providers must furnish to consumers before the conclusion of a contract and during the ordering process, along with other practices associated with e-commerce. In line with this framework, the regulation introduces provisions addressing various facets, including the obligation of service providers to provide information, the responsibilities of intermediary service providers, transaction guidelines, order-related obligations, order confirmation, protection of personal data, the burden of proof, the retention period of electronic records, complaint and audit procedures, and the authority to impose administrative sanctions.

By Law No. 6563 and the Regulation on Service Providers and Intermediary Service Providers in Electronic Commerce, the Communiqué on Trust Stamp in Electronic Commerce took effect on June 6, 2017. While applying the Trust Stamp is not obligatory for individuals and businesses engaged in e-commerce, businesses are encouraged to display the stamp on their websites if they adhere to the conditions outlined in the communiqué. Consumers consider this a significant indicator that the company offers a secure environment when engaging with them. It also underscores the importance of compliance with the stipulated terms.

One of the crucial requirements concerns the safeguarding of personal data. Türkiye endorsed the “Convention No. 108 on the Protection of Individuals about Automatic Processing of Personal Data” in 1981. This convention was formulated by the Council of Europe to establish consistent standards for protecting personal data and to define principles for international data transfer. Furthermore, the Council has issued recommendations on personal data protection, outlining principles applicable to various sectors such as medical databanks, scientific research and statistics, social security, direct marketing, insurance, police records, insurance, employment, electronic payment, telecommunications, and the Internet. Moreover, within the EU, the “Directive on the Protection of Natural Persons about the Processing of Personal Data and on the Free Flow of Data” (95/46/EC) came into effect in 1995 to standardize legislation on personal data protection among member states. In negotiating full membership to the EU, several chapters have been identified that focus on personal data. The EU’s progress reports on Türkiye have underlined the legal gap in the country’s data protection framework (Budak, 2018).

Personal data encompasses any information capable of identifying individuals. This information includes details about an individual’s private life, such as their identity, contact details, health status, financial records and accommodation history, religious beliefs and political opinions. The safeguarding of personal data is intricately linked to the economic domain. This connection arises from the necessity of secure data transfer for foreign multinational enterprises to invest in Türkiye and efficiently manage their investments in other countries. The absence of robust legal regulations in Türkiye historically impeded seamless data transfer, deterring multinational enterprises from considering investments in the country. Addressing this crucial gap, “Law No. 6698 on the Protection of Personal Data” was enacted in 2016. According to Article 2 of Law No. 6698, the law applies to “natural persons whose personal data are processed and natural and legal persons who process such data either wholly or partially through automatic means or non-automatic means, provided that they are part of any data recording system”. Furthermore, the “Regulation on Deletion, Destruction, or Anonymization of Personal Data” published in the Official Gazette on 28/10/2017, entered into force on 01/01/2018, in alignment with the provisions of Law No. 6698. The “Guideline on Deletion, Destruction, or Anonymization of Personal Data” was subsequently developed by the Personal Data Protection Authority to offer practical clarity on executing deletion, destruction, or anonymisation procedures outlined in the Regulation. Law No. 6698 specifies the procedures for removing, destroying, or anonymising personal

data in Article 7. According to this article, the person or organisation in charge of the data should delete, destroy, or make the data anonymous either on their initiative or upon the request of the person the data belongs to “if the reasons for processing the data no longer exist”, even if the data has been processed by Law No. 6698 and other applicable laws.

The “Regulation on the Registry of Data Controllers”, published in the Official Gazette on 30/12/2017, is a crucial legal framework established under Article 16 of Law No. 6698. This regulation plays a vital role in making personal data handling transparent and ensuring the enforcement of procedures and principles governing the establishment and administration of the Data Controllers Registry. This registry, overseen by the Presidency and subject to the supervision of the Board as stipulated in Law No. 6698, is maintained as a public record. The Data Controllers Registry specifies the particular records to be included by the regulation. Under the provisions of this law, individuals, legal entities, or their legal representatives engaged in processing personal data are mandated to register with the Data Controllers Registry Information System (VERBIS) before initiating any data processing activities. Through this process, data controllers generate records within the pertinent categories within the presidential data system. The identification of data controllers is made accessible to the public, thereby aiming to mitigate the potential misuse of personal data. There are sanctions for organisations or individuals who do not comply with these legal provisions. Except for individuals and legal entities explicitly delineated in the law, all entities and persons involved in the handling of personal data, whether by non-automatic or partially/fully automated means connected to any data system, fall under the ambit of VERBIS (Eroğlu, 2023).

The "Distance Contracts Regulation", Official Gazette on 27/11/2014, is a regulatory framework integral to the legal infrastructure of the digital economy. This regulation, formulated by Article 48 of Law No. 6502 on the Protection of Consumers, is designed to ensure fair and transparent agreements in the digital marketplace. Distance sales contracts, as defined herein, pertain to agreements established via distance communication tools up to and including the moment of contract formation between parties. These contracts function within a system specifically created for the remote marketing of goods or services when the vendor or supplier and the consumer are not physically present simultaneously. In contemporary times, the prevalent manifestation of such contracts occurs through online product sales platforms or commercial transactions facilitated via social media. Transactions conducted in these virtual environments fall under the purview of a distance contract,

provided these platforms mediate any stage within a system dedicated to the sale of goods or services and the other specified conditions are met (TR Ministry of Trade, 2022). Similarly, another regulatory instrument crafted in alignment with Articles 49 and 84 of Law No. 6502 on Consumer Protection is the “Regulation on Distance Contracts Regarding Financial Services”. This regulation, promulgated through the Official Gazette on 31/01/2015, aims to delineate the procedural frameworks and principles governing distance contracts related to financial services.

The “Regulation on Commercial Communication and Commercial Electronic Messages”, officially published in the Official Gazette on 15/07/2015, was instituted to operationalise the provisions of Law No. 6563. The regulation effectively addresses the legal vacuum concerning commercial electronic messages. It delineates critical aspects of commercial electronic messages transmitted through various electronic communication tools such as SMS, e-mail, and phone calls made via telephones and computers. It also outlines the responsibilities of intermediary service providers facilitating the dissemination of these commercial electronic messages. Consequently, this regulatory framework brings clarity to the rules governing commercial communication. To ensure the traceability of persons making commercial communications electronically, including the necessary information is mandatory. Additionally, this regulation stipulates that the nature of promotions and gifts must be explicitly disclosed, and the terms for participation and utilisation must be presented comprehensibly (TR Ministry of Trade, 2015).

A significant deficiency is the need for a comprehensive measurement and evaluation system for e-commerce in Türkiye. This deficiency hinders the accurate determination of Türkiye’s standing in the global e-commerce market and the precise national e-commerce market volume calculation. In response, the “Communiqué on Electronic Commerce Information System and Notification Obligations” was promulgated, as published in the Official Gazette on 1/08/2017 and numbered 30151. Subsequently, the Electronic Trade Information System (ETBIS) was established and put into operation to increase accessibility for e-commerce businesses and to facilitate healthy monitoring of e-commerce data. To participate in e-commerce or operate as intermediaries, service providers and intermediate service providers must register with ETBIS through the e-Government site before starting their operations (TR Ministry of Trade, 2023).

Another pivotal step towards advancing e-commerce was formulating an e-commerce strategy and action plan spanning 2018-2020. This plan envisioned that all companies would initiate infrastructure development on this matter by 2020, setting a two-year target. The E-Export Strategy and Action Plan (2018-2020), curated by the Ministry of Economy, received approval through the decision of the High Planning Council dated 31/01/2018 and numbered 2018/1, officially coming into effect upon its publication in the Official Gazette on 06/02/2018. Through this initiative, the Ministry perceives it as necessary for companies to reassess all their business models to align with technological advancements. The objective was to establish a new ecosystem infused with informatics in exports, ultimately transforming Türkiye into an e-commerce hub offering services globally.

On February 1, 2018, the General Communiqué on the Electronic Notification System came into effect to establish the procedures and principles concerning the electronic notification of documents by the provisions of Notification Law No. 7201. This communiqué delineates the individuals subject to electronic notification, sending and transmitting electronic notifications to the addressee, withdrawal from the electronic notification system, the addressee's responsibilities, penal provisions, and other related matters. In this manner, the inconsistencies in the notification law, particularly with the regulations introduced by Article 107/A of the Tax Procedure Law, have been rectified.

Finally, the need to safeguard competition in the e-commerce sector and protect consumers has prompted the introduction of new legal regulations. The Law Amending the Law on the Regulation of Electronic Commerce, also known as the "E-Commerce Amendment Law", and amending the Law on 6563, was published in the Official Gazette on 07/07/2022. The amendment aims to curb unfair competition and prevent monopolisation in e-commerce, fostering balanced and measured market growth. It introduces changes such as expanding the scope of the law to cover additional institutions, introducing new definitions, specifying prohibited content, outlining obligations for service providers and intermediary service providers, and setting conditions and sanctions related to licenses granted to e-commerce companies.

3.2. Regulations on Taxation of the Digital Economy

The taxation of the digital economy is a subject that has garnered considerable global attention. When considering the rules and principles of taxation, numerous countries need to

improve in this area. Countries with incomplete or inadequate tax systems are trying to implement measures tailored to their legal frameworks. Given that the Turkish Tax System possesses a structure that may not fully address specific aspects of the digital economy, paying particular awareness to the measures and regulations enacted in this context becomes imperative. Türkiye's membership in the OECD and its aspiration to join the EU make this a crucial matter.

3.2.1. BEPS Harmonization Regulations for the Taxation of the Digital Economy

In the taxation of the digital economy, it is necessary to act in the light of the OECD's priority areas, especially the regulations related to BEPS Actions 3, 5, 7, 8, and 10. In this regard, the following section of the study evaluates the arrangements made or planned to be made in the Turkish Tax System within the scope of “Preventing Artificial Avoidance of Permanent Establishment Status” (Action 7), “Reviewing and Improving the Controlled Foreign Corporation Rules” (Action 3), “Addressing Harmful Tax Practices” (Action 5) and “Harmonizing the Value Creation Basis and Transfer Pricing Results” (Actions 8-10).

3.2.1.1. Regulations to Prevent Artificial Avoidance of Permanent Establishment Status

International digital firms can engage in economic operations without requiring a physical and legal presence, as a permanent establishment pertains to a physical and legal entity. This impediment is of utmost significance regarding the taxation of non-permanent establishments inside the Turkish tax system. Artificial avoidance of permanent establishment status constitutes a significant obstacle in taxing digital economy activities. To prevent this obstacle, establishing the concept of a digital workplace should involve changes in legal legislation. In this way, tax loss can be minimised. Regarding Türkiye's situation, it is noteworthy that the Tax Procedure Law (TPL) does not define a “digital workplace” and provisions for “arrangements for taxing digital commercial activities”. Digital workplaces should also be considered as part of the definition of a permanent establishment (Budak, 2018).

As can be understood from Article 156 of TPL titled "Workplace", the formation of a workplace relies on the presence of a physical and legal entity. In today's digitalised world, this deficiency has been an essential tool for businesses to avoid tax. In order to overcome

this deficiency, the concept of "workplace" has been redefined in the new Draft TPL in parallel with the 7th BEPS Action Plan of the OECD. In addition, a new article has been created to define "electronic workplace". According to Article 129 of the New Draft TPL, the workplace concept has been redefined. Including mobile devices and electronic media or areas within the scope of the workplace is one of the crucial steps taken in the taxation of the digital economy in Türkiye (Artar, 2019).

Article 130 of the Draft Tax Procedure Law defines a digital workplace. It deals with commercial activities carried out on the Internet or similar environments. The Ministry of Treasury and Finance is authorised to decide the tax regulations of these workplaces. It is also authorised to hold intermediaries and buyers responsible for tax payments when purchasing and selling goods or services in an electronic environment.

Furthermore, Article 125 of the Draft Law includes those operating in the electronic environment within the obligation to notify the commencement of work. Article 127 of the Draft Law further expands the scope of the obligation by stipulating that the term "opening a workplace" shall mean the commencement of commercial or industrial activities in electronic media or areas, as well as at a physical location. The definition of "electronic media or areas" has been included to address this gap. In general, these provisions related to the digital workplace are designed to prevent the artificial avoidance of PE status, which poses a significant challenge in taxing digital economy activities. However, an effective solution has yet to be introduced. In this regard, a provision may be introduced stipulating that a workplace may be established if services are provided for a certain period. This would help prevent artificial avoidance of PE status.

3.2.1.2. Arrangements for Reviewing and Improving the Rules for Controlled Foreign Corporations

Reviewing the existing regulations on the taxation of Controlled Foreign Corporations (CFC) gains and harmonizing them with OECD rules is another critical issue for Türkiye in taxing the digital economy. The BEPS 3rd Action Plan aims to review and improve the CFC rules. In this context, the goal is to enhance the efficiency of tax practices between countries by examining issues such as the definition of CFC, exceptions, and thresholds in determining CFC income, the definition of CFC income, rules on the calculation and attribution of income, and preventing double taxation (Budak, 2018).

These changes necessitate immediate and significant legislative amendments in Türkiye, as in the rest of the world. In Turkish tax legislation, the regulations on CFC rules are included in the Corporate Tax Law (CTL) No. 5520 and Income Tax Law (ITL) No. 193. Nevertheless, with the draft law submitted to the Turkish Grand National Assembly in 2013, there is a plan to consolidate these two laws under a single umbrella titled “(New) Income Tax Law” and gather the regulations regarding the taxes to be levied on the earnings of natural and legal persons under this Law.

The concept of “CFC income” defined in Article 7 of Law No. 5520 was added to Article 75/2 of Law No. 193 in 2007 by referring to the conditions stated in the CTL and preserving the wording of the article. Article 75/2 of Law No. 193 was added to Article 75/2 of Law No. 193 in 2007 by referring to the conditions in the CTL and preserving the wording of the article. Article 7 of Law No. 5520 is a regulation significantly in line with OECD rules. Article 7 of the CTL states that other countries attract funds through harmful practices such as tax deferral. This leads to tax loss and evasion. Türkiye is, therefore, incorporating the practice of controlled foreign corporations into its tax legislation. The aim is to eradicate the tax inequality between taxpayers and those who invest in Türkiye. In the Draft Income Tax Law, "controlled foreign corporation" is a situation where natural persons and entities with complete tax liability control foreign subsidiaries. This control must be realised directly or indirectly, separately, or jointly, through at least 50% capital or profit share. The expression "directly or indirectly, separately or jointly" is used to prevent the shares of the subsidiaries from being below the control rate by dividing them among group companies or natural persons (TÜRMOB, 2016).

The 30th article of Law No. 5520 on CTL anticipates tax withholding for institutions domiciled in countries where the tax system is deemed equivalent to or where information exchange is ensured with the Turkish tax system. However, this rule cannot be applied since these countries have yet to be announced.

3.2.1.3. Regulations on Combating Harmful Tax Practices

Tax havens and favourable tax regimes, also called “harmful tax practices,” are form of tax competition that significantly impacts financial and other service activity distribution across different regions. This phenomenon erodes other countries’ tax revenues, changes trade and investment patterns, and weakens the fairness and objectivity of tax systems. The

impact of such harmful tax competition extends to reducing global welfare, as acknowledged by Dwyer (2000). This circumstance is further complicated because tax competition tends to lead to an overall reduction in taxes paid by individuals and companies. Issues become more complex when policymakers respond to tax competition by implementing policies that negatively affect neighbouring jurisdictions. As mobile factors of production show a preference for low-tax areas, countries engage in a competitive race to lower tax rates. This trend results in a general decline in tax rates across the board. Consequently, tax competition is expected to foster a “race to the bottom” regarding tax rates, significantly constraining public activities due to declining tax revenues (Zodrow and Mieszkowski, 1986). The term “harmful tax competition” is defined based on the following criteria, as outlined by Morriss and Moberg (2012):

- No or low effective tax rates
- Enterprises operating outside the domestic market
- Lack of transparency
- Absence of effective exchange of information.

The OECD initiated measures against harmful tax practices in 1998 through the “Harmful Tax Competition” report, and it further intensified its efforts in 2013. The organisation significantly accelerated its actions with the BEPS Action Plan No. 5, “Effectively Combating Harmful Tax Practices through Transparency and Substance Consideration.” In this context, countries must take the lead and comprehensively revise their existing regulations in alignment with the criteria set forth by the OECD, particularly emphasizing the principles of “transparency” and the “primacy of substance” (Budak, 2018).

This action of the BEPS Project aims to combat harmful tax practices based on transparency and the principle of substance over form. There are three main objectives: completing the review of existing regimes of OECD member countries by September 2014; devising strategies to enhance the involvement of non-OECD countries by September 2015; and conducting specific reviews and incorporating additions to the existing structure by December 2015 (Öz and Kara, 2016).

The issue of tax transparency plays a significant role in the efforts to combat aggressive tax planning. Countries frequently engage in non-transparent practices, particularly in corporate taxation. A non-transparent tax regime may facilitate tax evasion by withholding

investors' information. Additionally, it can give rise to transactions that may appear aimed at tax evasion even when not. The absence of tax transparency can foster tax evasion and facilitate clandestine tax practices (Kudrle, 2016).

Like many other countries, Türkiye needs to revise its regulations on harmful tax practices, which refer to strategies used by individuals and corporations to exploit gaps or inconsistencies in tax systems, to align with contemporary requirements. Regarding Turkish tax legislation, it is noteworthy that the Draft Income Tax Law incorporates specific regulations concerning the principles of transparency and the primacy of substance, as emphasised by the OECD. Article 59 of the Draft Income Tax Law and Article 30 of the Corporate Tax Law maintain the regulation titled “tax deduction in limited taxpayers” in terms of wording. However, the Draft Income Tax Law article has been expanded to include “corporations and real persons”.

Article 59 of the Draft Income Tax Law, titled “Tax Deduction on Payments to Countries Causing Harmful Tax Competition”, provides for a tax deduction of 30% on payments from Türkiye to these countries. In addition, the President of the Republic is authorised to determine the deduction rates for payments such as purchases of goods and subsidiary shares and transport payments made at arm’s length prices. However, no tax deduction is made for payments made for loans from financial institutions abroad. This regulation aims to take measures against harmful tax competition. This framework aims to prevent the utilisation of payments made under various designations to individuals or entities residing in these countries, commonly referred to as tax havens, to diminish tax bases in Türkiye. In this context, tax deductions on payments made to countries that cause harmful tax competition and the extension of this practice to electronic transactions are among the most important developments. In addition, transparency can be increased by exchanging information with other countries on tax administrative decisions regarding taxpayers in Türkiye. This will help to ensure tax efficiency.

Within the scope of BEPS Action 5, the OECD Preferential Regimes Progress Report on Harmful Tax Practices for 2017 was updated on January 24, 2018, and again on June 30, 2021, and some changes occurred. According to this report, technology development zones in Türkiye were assessed to fall within the scope of “potentially harmful tax competition” due to exemptions and incentives provided for research and development (R&D), software activities, and personnel salaries. Furthermore, the nexus approach in the technology

development zones regime underwent a change where “material need” was replaced with “not harmful” (Çelikkaya, 2022).

Participating countries agreed in 2021 on a standard international taxation model (taxation at source and a global minimum corporate tax) prepared by the OECD. They approved the entry into force of this treaty model by the end of 2023. Thus, it is a significant step towards fair tax revenue sharing and combating harmful tax competition (Çelikkaya, 2022).

Implementing a global minimum corporate tax is a positive step for Türkiye. This will tax the earnings of global corporations whose activities in Türkiye are not taxable and will provide an essential resource to the country. The first phase, which will cover multinational enterprises operating in Türkiye other than finance and mining, with a total revenue of more than EUR 20 billion and pre-tax profitability of more than 10%, will not find an application area in Türkiye. However, the second phase will be applied. With the introduction of the global minimum corporate tax, practices like Türkiye's current digital service tax are expected to end, and double taxation will be avoided. Although Türkiye has not yet taken any regulatory action, regulations are expected to be determined considering the impact on tax revenues. Investors and digital service taxpayers should work on the possible consequences of these regulations (Kahraman, 2021).

Statistics indicate that the intensity of tax competition has remained the same. Therefore, tax competition must be reduced more than combating profit shifting alone. If international differences in tax rates persist, investment preferences will be affected, and profit shifting will be possible. Furthermore, tax competition is likely to persist if there are perceived advantages to lowering tax rates, particularly in attracting investments and maximizing profits (Hebous, 2021).

3.2.1.4. Regulations on Harmonization of Transfer Pricing Results with the Value Creation Principle

As a member country of the BEPS Inclusive Framework, Türkiye has incorporated BEPS Action 13, one of the minimum standards, into its regulations and has enacted provisions in both domestic legislation and international agreements accordingly. Transfer pricing documentation requirements were already present in Turkish legislation, albeit

limited, even before the launch of the BEPS Project. However, following BEPS Action 13, essential regulations have been implemented, particularly on Country-by-Country Reporting (CbCR). Although administrative aspects have been determined, full implementation for a single accounting period has yet to be realised. Therefore, this new approach provided a renewed perspective compared to the previous practice (Erdem and Odabaş, 2023).

The objective of BEPS Action Plans 8, 9, and 10 is to standardise transfer pricing results for transferring intangible assets, risk and capital, and other high-risk transactions. This circumstance aims to create regulations that will prevent the reduction of taxable profits and the shifting of profits to low-tax jurisdictions by transferring intangible rights among group members. These amendments are included in the OECD Guidelines and the Model Tax Treaty. In the Turkish tax legislation, the regulations on the subject are mainly included in Article 13 of the CTL titled "Disguised Profit Distribution through Transfer Pricing". Article 57 of the New Income Tax Draft Law retains the regulations outlined in this article. In 2008 and 2016, amendments were introduced to Article 13 of the CTL.

Under the Corporate Tax Law No. 5520 (Article 13), disguised profit distributed through transfer pricing is accepted as a non-allowable expense in determining the corporate income. The legislator has introduced a regulation that aims to ensure tax security through transfer pricing and prevents the erosion of corporate income by ensuring that this declaration reflects the actual situation based on the taxpayer's declaration. Article 13 of CTL No. 5520 complies with the transfer pricing principles of the OECD guidelines for tax administrations and multinational companies. In particular, "Transactional Profit Methods", which corporations can use to determine the prices or prices that may be applied in transactions with related parties, were added to the text of the article in 2016. It parallels the new methods proposed in the Transfer Pricing Guidelines updated by the OECD within the scope of the 8th, 9th, and 10th Action Plans. Two significant developments occurred in 2016 and 2020:

On March 16, 2016, the Revenue Administration (RA) released the "Draft General Communiqué on Disguised Profit Distribution through Transfer Pricing No. 3" on its website. The Draft Communiqué further clarifies issues previously subject to interpretation in existing communiqués. It addresses existing deficiencies, corrects inaccurate examples, and introduces new documentation rules in line with the OECD's BEPS Action Plan,

specifically focusing on the CbCR, cost contribution agreements, and additional comparability factors (PWC, 2016).

Aligned with the OECD's BEPS Action Plan, a section titled "Other Considerations in Comparability Analysis: Local Market Characteristics, Experienced Workforce, and Group Synergies" has been included. This section delves into local market characteristics, shedding light on the geographic market's features where the company operates within the context of comparability analysis. It addresses the challenges of assessing disparities between geographic markets and determining suitable comparability adjustments. The document notes that these differences may stem from the location advantages of the operating market. Suppose comparable companies and transactions exist in the local market. In that case, it emphasizes that the most reliable indicator for allocating the location advantage of peers in this market is these peers themselves.

Regarding cost contribution agreements, the provisions in the Draft Communiqué are in parallel with the OECD regulations. The definition of cost contribution agreements and the details are discussed. According to this regulation, two standard agreement types are Development Cost Contribution Agreements and Service Cost Contribution Agreements. The arm's length principle should assess these agreements. In addition, the proportionality of the compensatory payments determined in proportion to the total contributions of the participants must be proportional to the total benefits expected to be obtained under the agreement. The arm's length principle must adjust if consistency cannot be achieved.

Another development is the significant amendments to the transfer pricing legislation with the "Presidential Decree Amending the Law on Disguised Profit Distribution through Transfer Pricing" numbered 2151, published in the Official Gazette on 25/02/2020, within the framework of compliance with the OECD's BEPS Action Plan and the powers granted to the President by the Law No. 6728 on the Improvement of the Investment Environment. Among these amendments, the most prominent one is the amendments made in the transfer pricing certification scheme. Accordingly, companies exceeding the limits specified in the Presidential Decree will be subject to the triple documentation obligations of "General Report" (Master File), "Annual Transfer Pricing Report" (Local File) and "Country-by-Country Reporting". Thus, the three-layered structure in BEPS Action 13 has been adapted to Turkish legislation for the first time. As of this date, the CbCR has officially become part of Turkish legislation (Erdem and Odabaş).

These documentation obligations were introduced due to the commitment of countries, including Türkiye, in the scope of the outcomes of the OECD BEPS Action Plan. Since it is an international standard, the transfer pricing documentation obligations introduced by the Presidential Decree have almost the same characteristics as many countries' practices. The Decree in question regulates the following issues (Consulta, 2020):

- The documentation scheme in transfer pricing,
- The scope of the definition of a related person,
- Transfer pricing transactional profit methods,
- Application of advance pricing agreements to prior periods,
- Reduced tax loss penalty for taxpayers who fulfil their documentation obligations in full and on time.

Considering the new regulations, it has become increasingly crucial to fulfil transfer pricing documentation obligations comprehensively and promptly. Companies should adhere to the recently introduced general documentation and country-based reporting. It is noted that annual reports, resembling traditional financial reports without incorporating any analyses or precedent studies, need to align with the legal expectations for transfer pricing documentation set by authorities (Consulta, 2020).

The Ministry of Treasury and Finance & Revenue Administration (RA) published the Draft Communiqué Serial No. 4 on Disguised Profit Distribution through Transfer Pricing on its official website on April 16, 2020. Taxpayers submitted it for information and examination, collecting taxpayer opinions until May 1, 2020.

Both the “Draft General Communiqué on Disguised Profit Distribution through Transfer Pricing No. 3 Series” and the “Communiqué No. 4 Series Amending the General Communiqué on Disguised Profit Distribution through Transfer Pricing No. 1 Series” aim to integrate the OECD Transfer Pricing Guidelines into Turkish legislation. These regulations are significant in showcasing Türkiye’s commitment to managing the taxation challenges posed by the digital economy.

3.2.2. Regulations within the Scope of VAT

In addressing challenges related to the taxation of the digital economy activities concerning VAT, Turkish tax legislation, akin to regulations in numerous other countries,

has undergone certain amendments. The ensuing discussion will focus on specific aspects of these regulations.

The inclusion of the concept of a “workplace in the electronic environment” in the draft TPL, currently in enactment, reflects international endeavours to improve the effective taxation of the digital economy. Notably, amendments to the Tax Procedure Law will affect the entity responsible for declaring VAT. According to Article 130 of the Draft Law, if the internet, intranet, extranet, or a similar telecommunication medium or instrument is assigned to or utilised for industrial, commercial, or professional purposes, it will be considered establishing a workplace in the electronic environment. However, the proposal extends the scope of the workplace to encompass electronic media under Article 129 (Budak, 2018).

It is essential to distinguish that electronic media, such as websites, function as tools. Digital platforms, akin to vehicles transporting goods from one city to various parts of the country, do not qualify as workplaces or branches. Similarly, digital platforms on the internet should not be deemed as workplaces. This distinction is crucial, considering the digital platforms of foreign individuals or institutions selling services over the internet as workplaces would assign VAT liability to these entities. It raises the complex issue of establishing a mechanism compelling these entities with no ties to Türkiye to declare taxes. Consequently, employing the electronic workplace for declaration and liability may prompt discussions on whether the tax responsibility should fall on the service provider or the declaring entity (Ertuş, 2016).

Due to the current legal regulations not recognising the electronic environment as a workplace, significant challenges arise for potential taxpayers in declaring electronic services received from abroad as responsible. The “full withholding application” section in the VAT general application communiqué stipulates that the withholding made by the tax responsible should be declared with the VAT Declaration No. 2. However, the wording of this provision imposes an obligation on legal entities to declare as liable, potentially encompassing taxpayers who are not liable and therefore do not submit a VAT Declaration No. 1. This issue requires clarification (Yılmaz and Değer, 2018).

Another hesitation regarding the VAT declaration with the title of responsible is whether the companies operating in different fields and establishing different companies within their organisation have a workplace in Türkiye. For instance, a US-based search

engine company might have established a Türkiye company specialising in advertising and marketing. However, suppose the same company manages its advertising operations through another company in Ireland, where the transaction subject to taxation is managed. In this case, the transaction subject to taxation is managed from abroad despite the establishment in Türkiye. This circumstance may create uncertainty about which party will file a tax return (Ertaş, 2016). Consequently, the concepts of “workplace, legal centre, and business centre,” considered in the VAT “full withholding” application, need clear and precise definitions.

At the end of 2017, an additional provision was introduced to Article 9 of the VAT Law, which governs tax liability. According to this amendment, these service providers will bear VAT on electronically provided services by natural persons lacking a residence, workplace, legal centre, and business centre in Türkiye to other non-VAT-paying individuals. Additionally, the Ministry of Treasury and Finance is authorised to determine the scope of the services provided electronically and the procedures and principles regarding the implementation. To improve the efficiency of VAT collection, issues such as categorising services related to the digital economy and determining applicable VAT rates need to be addressed. Moreover, it is essential to increase international administrative cooperation in reforms to improve the efficiency of VAT collection on imports of low-value goods and share information on specific issues at the international level.

In addition, the amendment to the General Communiqué on Tax Procedure Law will facilitate VAT collection by recognising the revenues generated in Türkiye by international companies selling content and services over the Internet. However, in order to realise this collection, either in parallel with the European Union VAT directives or by imposing an obligation to pay VAT as responsible for these payments on the institutions (such as banks) that make payments abroad, it should be ensured that international companies providing services are only liable for VAT.

In the Official Gazette dated 31/01/2018, the “Communiqué (Serial No: 17) Amending the Value Added Tax General Implementation Communiqué” was published. Article 1 of the Communiqué introduces a section titled “Services Provided Electronically to Real Persons Who Are Not Taxpayers of Value Added Tax” under the section heading “Transactions Made by Those Whose Residence, Workplace, Legal Centre, and Business Centre are Not Located in Türkiye” in the (I/C) section of the Value Added Tax General Implementation Communiqué. The services provided electronically by individuals without

a residence, workplace, legal centre, or business centre in Türkiye to natural persons not subject to VAT in Türkiye for a fee are now subject to VAT. The related VAT falls under “Special VAT Liability for Electronic Service Providers” as per number 3. VAT declarations for these services must be submitted electronically with the VAT declaration. Additionally, the section stipulates that if electronically provided services are structured in a manner constituting a workplace, the tax on these services should be declared and paid following general principles (using VAT declaration No.1).

Furthermore, the contract between the parties does not specify the electronic service provider, which is not reflected in the invoice or similar documents. In that case, the intermediaries facilitating such services will be responsible for declaring and paying VAT on electronically provided services. Conversely, anyone with the power to request payment from customers, establish the terms and conditions related to the specific service or carry out the service will be classified as an electronic service provider.

Regarding the tax calculation, the Communiqué stipulates that those within the scope of “Special VAT Liability for Electronic Service Providers” shall calculate VAT for the services they provide electronically to natural persons not liable for VAT in Türkiye at the applicable rate. They are not obliged to keep books by the Tax Procedure Law. Additionally, according to the regulation, if the services are related to those declared in the scope of “Special VAT Liability for Electronic Service Providers,” the VAT shown in the invoices and similar documents issued due to the goods and services provided by those liable for VAT in Türkiye, within the scope of Article 29/1 of the VAT Law, can be deducted. Taxpayers within this category must submit their VAT calculations in Turkish Lira (TL) monthly during the calendar year. The deadline for submission is the evening of the twenty-fourth day of the month following the taxation period. This procedure can be done through the Internet tax office using VAT Declaration No. 3. Taxpayers falling within this category are exempt from submitting a declaration for the specified time if no transactions require declaration. On the other hand, the declared VAT must be paid until the evening of the twenty-sixth day of the month.

Published in the Official Gazette dated 19/12/2018, the “Presidential Decree Amending the Decree on the Determination of Value Added Tax Rates Applicable to Goods and Services”, numbered 475, stipulated an increase in the VAT rates for e-books from 8% to 18% and for e-newspapers and e-magazines from 1% to 18%, effective as of 01/01/2019.

Simultaneously, the VAT rate for e-book readers was also adjusted to 18%. Conversely, in the Official Gazette dated 18/01/2019, VAT exemption was granted for publishing books and periodicals by publishers certified by the Ministry of Culture and Tourism. On the other hand, as published in the Official Gazette dated 18/01/2019, the delivery of books and periodicals by publishers certified by the Ministry of Culture and Tourism is exempt from VAT. In addition, the delivery of printed books and periodicals is also exempt from VAT.

Consequently, the delivery of printed books and periodicals became exempt from VAT. However, there are detailed explanations on the subject in the “Communiqué (Serial No: 25) Amending the Value Added Tax General Application Communiqué” published in the Official Gazette dated 23/03/2019. Notably, in the “17.1. Scope” section of the Communiqué, digital transactions were explicitly excluded from the VAT exemption with the provision: “No exemption applies to the sale of electronic books and periodicals in an electronic environment, and the delivery of electronic book and periodical readers, tablets, and the like”.

Additionally, irrespective of the regulations, the "Law on the Regulation of Electronic Commerce", numbered 6563, and the related regulation requires entities providing intermediary services in the online environment to electronically notify the Revenue Administration of specific transaction-related information within one month.

3.2.3. Digital Service Tax

Online applications such as Google, Facebook, Instagram, Microsoft, Spotify, LinkedIn, and similar platforms, extensively used by individuals in their daily lives, have evolved into significant sources of public revenue in the countries where they operate. Nations that leverage these services have recognized the necessity of taxing the income generated by these providers within their borders. However, there has yet to be a consensus among countries. Consequently, each country has enacted and implemented distinct digital taxes based on domestic policy (Özkan, 2020).

The legal nature of the DST can be evaluated according to its place in the classification of tax types. In the classical classification of taxes according to their subjects, it is a controversial issue whether the DST is levied on income or a kind of expenditure tax. It is a

separate issue located in the indirect-direct taxes distinction made according to the relationship of the tax with the economic activity (Şen and Sağbaşı, 2016).

In the classification based on the source or subject of the tax, if a tax is levied on a person's income, it is an income tax, and if it is levied on a good or service subject to consumption, it is an expenditure/consumption tax (Şen and Sağbaşı, 2016). In the classification made according to the relationship of the tax with the economic activity, taxes whose subject matter is continuous, whose taxpayer is predetermined and whose tax base is continuous are characterised as direct; taxes whose subject matter and tax base are not continuous and whose taxpayer is not predetermined are characterised as indirect (Nadarođlu, 1998). In this framework, when the DST is analysed, it can be easily seen that it is neither levied on income nor expenditure. On the other hand, it is possible to say that the DST is a direct tax in the direct-indirect tax distinction. Because the subject and taxpayer of the DST are predetermined, and the tax base is permanent. In other words, the DST does not fit in the classical distinction and matching.

The global introduction of the digital service tax began in 2018, 2019, and 2020. Hence, the tax is still new and is accompanied by various taxation challenges. Worldwide, digital service tax rates vary from 1.5% to 7.5%. Türkiye has the highest rate among the considered countries, with Austria having the closest rate at 5% (Akçura, 2021).

In Türkiye, a legal framework for digital service tax was established by enacting the “Law on Digital Service Tax and Amendments to Certain Laws and Decree-Law No. 375,” numbered 7194, published on December 7, 2019. Subsequently, on March 20, 2020, the “Digital Service Tax Implementation General Communiqué” was issued. These legal regulations clearly define the subject, taxpayers, liabilities, exemptions, exceptions, and other aspects of digital service tax.

3.2.3.1. Subject of Digital Service Tax

In Law No. 7194, the description of the subject matter of the Digital Service Tax necessitates a technical approach that is both detailed and comprehensive. The digital service tax applies to a range of services, including advertising services on digital platforms and services that enable the sale, consumption, and use of digital content, such as computer programs, applications, music, video, games, and in-game applications. Moreover, the

digital service tax encompasses the revenues generated by platform services that facilitate the purchase or sale of goods and services and the income from intermediary services offered by digital service providers for these services. It is important to note that if services under multiple sections and subsections of the relevant article are offered on the same digital platform, each service will be taxed according to its rules.

Digital Advertising Services

The Digital Service Tax Implementation General Communiqué provides a detailed explanation of the items outlined in the digital service tax law, supported by illustrative examples. According to the communiqué, the advertising services offered in the digital environment encompass the following:

- “Search engine advertising, such as displaying the ad with search results or prioritizing advertiser-related search results.”
- “Banner ads”
- “All kinds of audio, visual or written advertisements published in digital media before, during or after watching a video or user sharing”
- “Advertisements transmitted online through the software on electronic devices”
- “Pop-up ads (pop-ups and similar)”

Moreover, the revenues derived from such advertising services fall within the scope of the digital service tax. Additionally, the pertinent implementation communiqué provides various examples to enhance comprehension of these advertising services.

For instance, in social networks such as YouTube, Facebook, Instagram or other digital environments where similar results arise, the advertising revenues obtained by the platforms in question from the advertisements that individuals watch or must watch while watching any video or communicating with each other are subject to digital service tax.

Digital Content Sales and Utilisation Services

With advancements in ICT, written and printed media content has shifted to the digital realm. This transition has given rise to various computer programs and software development. The revenue generated from presenting content through these programs and

software to users via electronic devices is subject to digital service tax under the relevant law.

As outlined in the Digital Service Tax Implementation General Communiqué, the following are subject to digital service tax:

- “Applications and software accessed via mobile phones, tablets, and similar electronic devices,”
- “Audio, video, and text content such as television series, films, photographs, articles, magazines, and newspapers,”
- “Games played on game consoles, digital games played online and offline,”
- “In online games, the sale of a period, right, and packages related to the application to the game user in return for a certain fee.”

As known, unlike traditional broadcasting streams, individuals with digital transformation have gained the opportunity to watch and follow visual broadcasts wherever and whenever they want. However, various applications are necessary to monitor and track them. Consequently, service providers charge individuals a subscription fee for a certain period for this presentation. In this context, the digital services of service providers collecting subscription fees fall under the purview of digital service tax. Accordingly, digital platforms such as Netflix, Disney Plus, and Exxen, which also provide services in Türkiye and engage in the above activities, are taxpayers of digital service tax (Yoruldu, 2023).

Those Who Create and Operate Digital Environments Where Digital Users Can Interact

With the widespread use of online applications, various digital environments have emerged where individuals can engage in communication. Through these applications, people can communicate in written and audio forms and share various visuals. The providers and operators of these digital environments are also subject to digital service tax.

According to the General Communiqué on Digital Service Tax Implementation:

“Those operating digital media applications and sites catering to specific users, allowing them to share various audio, visual, and written content and comment on shared posts, thereby facilitating communication among users,”

“Shopping websites that act as intermediaries for the sale of products from various brands, streamlining processes such as purchase, sale, delivery, and return of the products within this scope,” will be subject to digital service tax.

In the digital realm, various websites and applications serve as platforms for connecting managers and employees, facilitating the sharing of professional experiences and careers. Moreover, individuals seeking job opportunities can connect with employers through these platforms. The revenue earned by those generating income from these environments is subject to digital service tax. In this context, it can be asserted that the activities of companies, applications, and programs such as Amazon, Trendyol, Hepsiburada, Zoom, Microsoft Teams, Yemek Sepeti, and Getir, along with the income they generate from these activities fall within the scope of digital service tax (Yoruldu, 2023).

Intermediaries for Services to be Provided in Digital Environment

Many intermediary services facilitate connections between businesses and individuals seeking to improve their digital services. According to the second paragraph of Article 1 of Law No. 7194, digital service providers who offer brokerage services in the digital environment are included in the digital service tax and must pay taxes.

As evident from the example, certain virtual stores may aggregate products from multiple stores in their virtual store. These virtual stores provide intermediary services, such as directing users through various filtering services, and generate revenue from these services. According to Law No. 7194, this revenue is subject to digital service tax.

Implementing the digital services tax has enabled the taxation of a critical tax source. However, the current implementation has significant shortcomings. Considering these shortcomings, a review of the digital services tax may help increase the tax's fiscal and economic benefits and reduce tax losses and evasion.

3.2.3.2. Digital Service Tax Liability and Tax Responsible

Article 8/1 of the Tax Procedure Law defines the taxpayer as “a natural or legal person to whom a tax liability arises according to the tax laws.” Article 8/2 defines the Tax

Responsible as “the person who is the addressee against the creditor tax office in terms of tax payment.”

Digital service providers are subject to digital service tax according to Article 3 of Law No. 7194. An important aspect here is that the status of these service providers as total taxpayers under Law No. 193 and CTL No. 5520, as well as whether they conduct the relevant activities through their workplaces or permanent representatives in Türkiye (in cases where they are limited taxpayers), does not impact their classification as digital service taxpayers. However, in instances where the taxpayer lacks a physical presence in Türkiye, making it challenging for the tax administration to identify a direct interlocutor, the Ministry of Treasury and Finance of the Republic of Türkiye may consider the parties involved in the transactions and those mediating the transaction and payment responsible for the payment of the tax to secure the tax receivable. In simpler terms, if the tax cannot be collected from the company generating income, the administration may pursue collection from other entities engaged in transactions with the said company (Akbulut and Korlu, 2023).

3.2.3.3. Exemptions and Exceptions Applied to Digital Service Tax

The regulation regarding exemptions and exceptions to the digital service tax is in Article 4 of the Law. The exemption is defined in the first paragraph of this article, stipulating that individuals (digital service providers) are exempt from digital service tax if, in the accounting period preceding the relevant one, “their revenues generated in Türkiye are less than 20 million Turkish Liras or their worldwide revenues are less than 750 million euros, or the Turkish Lira equivalent in other foreign currencies”, attributable to the services listed in Article 1 of the Law. Small enterprises are protected in Türkiye by keeping the exemption thresholds high.

According to the example provided in the Digital Service Tax Implementation Communiqué, an enterprise that is not a member of a consolidated group considering financial accounting and generates income through services outlined in Article 1 of the Law has amassed revenues of EUR 740 million globally and TL 28 million in Türkiye during the relevant accounting period. Consequently, this enterprise will be exempt from Digital Service Tax in the relevant period since its worldwide revenue does not exceed EUR 750 million in the applicable accounting period.

In Türkiye, various criticisms assert that the current law's exceptions are insufficient.

These critiques can be summarized as follows (Kaya, 2020):

- Introduction of exemptions like the practices in France and the UK, specifically for transactions between group companies,
- Consideration of exemptions for transactions between companies,
- Exceptions for operating systems with a broad range of uses,
- Introduction of exemptions to prevent double taxation.

Moreover, the exemptions and exceptions outlined in the Law concerning digital service tax may be reorganised by adding or removing provisions. It is crucial to note that exemptions and exceptions in other tax laws do not apply to digital service tax.

3.2.3.4. Tax Base and Rates for Digital Service Tax

The tax base for digital service tax is the income from taxable services during the relevant taxation period. This income constitutes the digital service tax base. All provided income is considered the tax base, which includes interest, premiums, and similar values like maturity, price, exchange rate differences, and interest, premiums, and similar values. In addition, fees charged for services that are part of or complementary to the taxable digital service are also included in the tax base. However, digital service providers do not include value-added tax in their reported income. With this amendment, the scope of the tax base has been expanded, and the taxation process has been made more transparent (Değirmendereli, 2020).

The digital service tax base is the revenue generated from taxable services during the taxation period. This revenue is converted into Turkish currency at the foreign exchange buying rate of the Central Bank of the Republic of Türkiye, ensuring a standardised and reliable conversion. No deduction is made from the tax base, and the digital service tax is not shown separately on invoices or invoice substitute documents. According to the implementation communiqué, all benefits, services, and values represented by money, such as sales or transaction fees, commission fees, subscription fees, membership fees, and brokerage fees, are included in the tax base. This approach enhances the transparency of the taxation process.

Article 5, paragraph 3 of Law No. 7194 states that the digital service tax rate is 7.5%. Tax is calculated by applying this rate to the tax base, and no deduction can be made from this computed tax. However, the President of the Republic is authorised to reduce the mentioned rate to 1% for each type of service separately or collectively or to increase it up to two times. In cases where more than one service is provided for a single price, the tax rate applied to the tax base considers the cost of the service with the highest value (Değirmendereli, 2020). Moreover, it is observed that the tax rate in Türkiye is relatively higher compared to other countries. These regulations manage the taxation process and determine the authority over tax rates (Akçura, 2021).

3.2.3.5. Declaration, Assessment, and Payment of Digital Service Tax

The procedures for declaring, imposing, and paying the digital service tax are specified in Article 6 of the applicable legislation. Taxpayers are required to pay a digital service tax upon declaration. Article 3 of Law No. 7194 states that tax authorities are empowered to withhold taxes from those who receive digital services. Under these circumstances, the taxpayer or the individual liable for tax must file the digital service tax declaration by the deadline of the final day of the month that follows the taxation period. The taxing period for this tax is specified precisely as monthly intervals within the calendar year. This period can be determined quarterly according to the service type and activity volume. Taxpayers must submit a declaration regardless of whether they have received revenue in the relevant period. On the other hand, they are not obliged to submit a declaration if no tax has been deducted.

The digital service tax declaration can be conveniently submitted through the digitalservice.gib.gov.tr internet address. The tax is imposed by the relevant tax office or, in the absence of a tax office, by the Ministry of Treasury and Finance. The recipient of the imposed tax is either the digital service taxpayer or the tax responsible for tax withholding. The relevant taxpayers or tax-responsible individuals are responsible for settling the digital service tax within the declaration period. Payments can be efficiently executed through the Internet tax office of the Revenue Administration (Yoruldu, 2023). Furthermore, the taxpayer or responsible parties must pay the digital service tax within the declaration period for each taxation period. Digital service taxpayers can also account for this tax payment as a cost when determining the net income subject to income or corporate tax (Değirmendereli, 2020).

3.2.3.6. Security of Digital Service Tax

When the discussion on digital service tax first emerged in Türkiye, it faced resistance from organisations providing these services. A similar scenario unfolded globally, mainly with organisations, primarily United States (US) companies, expressing their discontent after the tax was implemented in France. In response, the US increased tax rates and amounts on the entry of certain French-origin products sold in the US. Considering such reactions, Article 7 of the Law introduced a new tax offence and penalty. Notably, a significant and novel penalty was introduced. In cases of a tax offence, the Ministry of Treasury and Finance is authorised to “block the digital service” in addition to the existing tax penalties (Güngör, 2021). If digital service providers or their representatives in Türkiye fail to fulfil their obligations to submit and pay returns under the Tax Procedure Law. In that case, the tax office may warn them through communication tools, information on their websites, electronic mail, and similar methods. This situation is announced on the revenue administration website. This amendment ensures that tax-related notifications are made electronically and that warnings made using communication tools are valid.

The previous requirements must be completed within 30 days from the announcement issued by the Revenue Administration. If the responsibilities are not completed within this timeframe, the Ministry of Treasury and Finance will decide to restrict access to the services provided by digital service providers. This decision will be referred to the ICT Authority, and communication providers will be notified. Communication providers must promptly execute the decision within a 24-hour timeframe. The Ministry of Treasury and Finance has been given the power to enforce access restrictions on digital platforms and websites to safeguard tax security. It is essential to seek the opinion of the Ministry of Transport and Infrastructure when deciding the implementation methods and principles of the article on tax security by the Ministry of Treasury and Finance.

In cases where a digital service provider does not fulfil its obligations, blocking its activity at the administration’s discretion may not be the right approach to secure tax collection. Such regulation should ideally be subject to a judicial decision to avoid administrative arbitrariness, which could potentially restrict communication areas providing certain services and may infringe on freedoms (Saraçoğlu and Kahraman, 2020).

However, this penalty threatens fundamental rights and freedoms because of non-fulfilment of economic performance and “tax security”. Access to digital services is considered a fundamental human right under Articles 17, 22, 25, 26, 28, and many others of the Constitution. Preventing this right based on the above reasons is a regulation that is highly susceptible to criticism against the basic principles of law and the Constitution. The mentioned regulation contradicts the provisions of the Constitution and the regulations on freedom of labour and contract stipulated in Article 48 (Güngör, 2021).

In addition, the identification and implementation of tax security measures under the umbrella of a joint institution or organisation can increase the stability of both countries and businesses. This approach can create a fair tax system by reducing tax evasion and ensuring a more efficient collection of tax revenues. It can also give international businesses a more predictable tax environment and build confidence to invest and grow. In this way, ensuring tax security can be an essential step towards global economic stability and sustainable development.

3.2.3.7. Effectiveness of Digital Service Tax

To determine the effectiveness of a tax it is necessary to examine whether the tax is compatible with the objectives of tax and fiscal policy. In this context, evaluating the effectiveness of a tax introduced by the legislator involves considering two key aspects. The first is discerning the legislator’s intended goals with the tax by analysing the justification provided in the relevant law. The second is measuring the direction and extent of the effects on the objectives of tax and fiscal policy resulting from implementing the relevant tax law, whether explicitly targeted in the justification or not (Nadaroğlu, 1987).

Law No. 7194 introduced the digital service tax, and upon examining the general justifications of the law, it is evident that the prior purpose is to tax multinational companies generating profits in Türkiye without having physical assets. The exemption limits have been set with this objective in mind. In addition, the current tax rate should be optimised to ensure economic efficiency when implementing the digital service tax. Other aspects can only be indirectly argued through interpretation. When assessing the general justifications outlined in the law in conjunction with the objectives of fiscal policy, the indirect objectives of the law can be interpreted as follows (Yoruldu, 2023):

- Preventing tax losses and evasion and enhancing tax capacity by reducing the informal economy, which has proliferated due to digitalisation.
- Establishing fairness in income distribution through a fair and balanced distribution of the tax burden, ensuring it extends to the broader society and the service sector.
- Limiting Türkiye’s exposure to harmful international tax competition.

To assess whether these objectives have been achieved it is necessary to calculate and analyse the tax revenue related to the revenue transfer from the digital service tax to the state. This data, often called the digital service tax implementation results, is presented in the Table 2 below.

Table 2. Share of digital service tax in total tax revenues by years

Year	2020	2021	2022	2023
Digital Service Tax Collection (TL)	1.060.932	2.829.623	5.475.048	10.310.430
Total Tax Collection (TL)	833.250.502	1.164.988.132	2.353.437.651	4.500.865.586
Share of Digital Service Tax (%)	0.12	0.24	0.23	0.22

Source: TR Ministry of Treasury and Finance General Directorate of Accounting, (2023).

(The data in the table are obtained from the Central Government Budget Statistics/Tax Revenues for the years 2020, 2021, 2022 and 2023 on the official website of the Republic of Türkiye Ministry of Treasury and Finance, General Directorate of Accounting).

Looking at the collection level from March 2020, when the digital service tax was included in the Turkish tax system and at the same time started to be implemented, until the end of 2020, the share of the annual revenue from this tax in total tax revenue is 0.12%. By the end of 2021, this ratio doubled to 0.24%. In other words, the revenue from the digital service tax increased by 100% In 2022 and 2023, it is 0.23% and 0.22%, respectively, with minimal differences. There was no such increase in 2020 because the relevant tax was introduced in March 2020, and therefore, the whole year was not subject to the tax. This could mean that income could double the following year (2021) when all months are subject to the tax.

Broadening the tax base and tax rate is essential to increasing the effectiveness of the digital services tax. The current tax rate should be harmonised with international standards

and brought closer to the OECD average. Multinational companies must pay digital service tax in every country in which they operate worldwide. Therefore, if they limit or terminate their operations in Türkiye, Türkiye's tax revenues may decrease and lose its attractiveness to international investors.

Limiting tax exemptions and optimising tax rates can broaden the tax base. Thus, the share of digital services tax in total tax revenues can be increased. However, there are follow-up difficulties in taxing individuals and corporations operating in the digital environment. This situation leads to the emergence of new tax needs. Therefore, updating tax practices and developing mechanisms for taxing those doing business on digital platforms is essential.



4. CONCLUSIONS

The rapid advancements in ICT have made digitisation a crucial component in several aspects of life. The swift technological advancements, the proliferation of communication, the expansion of the Internet's role in daily life, and the accessibility of information also influences the economy sector. These factors have led to traditional or classical economic rules and concepts needing help to respond to new needs. In other words, digitisation has created a new economy marked by its creative destruction. Consequently, there is a growing need to formulate and develop concepts and rules for this emerging economic order. The concept of the digital economy was introduced to the literature in 1995 and swiftly became a focal point for countries, governments, and international organisations. A new economic system has emerged, encompassing e-commerce, online application stores, cloud computing, online advertising, 3D and 4D printing technology, crypto assets, and robotic technologies. The term "digital economy" conceptualises this novel system, which can also be expressed through phrases like "network economy," "information economy," "weightless economy," or "new economy."

The advent of digitalization has been one of the most significant advancements in the economic realm since the Industrial Revolution. It has propelled the growth of business operations, ushered in novel job roles, fostered the adoption of versatile business models, and given rise to unprecedented phenomena like the proliferation of digital tools. The digital economy is expected to reach unprecedented levels with innovations like the Internet of Things, advanced robotics, crypto assets, and breakthroughs that have yet to be discovered in the coming years. Alongside these innovations, the free movement of data has been included, enabling the unrestricted flow of goods, capital, or labour and the free circulation of data.

As the digital economy proliferates, all companies' production and marketing approaches, particularly multinational corporations, have undergone significant transformations. Businesses that take these transformations into account can gain benefits. They can enhance efficiency and reduce transaction costs by adapting their business models and capacities to the new digital economic order. Moreover, they have augmented their revenues by streamlining access to global markets. In this context, as companies establish a presence in the digital realm, they tap into a broader customer base, consequently increasing

revenue potential through enhanced customer accessibility. These positive outcomes highlight the potential gains for businesses in the digital economy.

The digital economy is a phenomenon that underlies economic growth and competitive advantage, making it a strategic priority for the private sector and governments. It encompasses ICT, with developments, innovation, and investments crucial in determining a country's global competitiveness. Recognising the importance of the transition to a digital economy at the national level, governments aim to exploit the potential in this area by developing appropriate digital strategies and policies. These initiatives aim to incentivise businesses that focus on research and development in the digital field.

The values created within the digital economic order can manifest as various income elements. Revenue streams such as online advertising, rental or sales of digital products, earnings from virus protection software and online technical support services, membership and subscription revenues on digital platforms, and income derived from content and technical licenses due to cloud-based operating systems are generated within digital environments. Given the expanding volume of the digital economy, it yields a substantial revenue volume.

States have faced substantial difficulties in taxing income derived from the digital economy. Due to the lack of a worldwide agreement, numerous nations have independently implemented measures to synchronise their tax systems with the digital economy to tackle these issues. However, the urgency of the situation must be addressed. The digital economy is rapidly expanding, and countries risk losing significant tax revenues without effective taxation. These measures prevent multinational companies operating in the digital economy from diminishing tax revenues through aggressive tax planning.

Advancements in ICT, the diminishing significance of geographical borders facilitated by new economy network systems, and the digitalisation of products and services have introduced new distribution channels. This transformation has compelled changes in economic relations, leading to adjustments in legal frameworks for taxation. The primary difficulties associated with taxing the digital economy arise from the transactions involving digital goods and services, as well as the operations of virtual enterprises. The main concerns are mostly related to the lack of a permanent establishment, which makes it challenging to ascertain the jurisdiction of the tax authority and difficult to identify the taxpayer and tax

base. Furthermore, issues related to both direct and indirect taxes play a significant role. Lastly, various challenges have surfaced concerning specific areas such as cloud computing services, sales of application programs, and the taxation of participatory network platforms, all integral elements of the digital economy.

The main concern when examining the tax issues of the digital economy, particularly about direct and indirect taxes, is the permanent establishment issue. Digital economy activities being carried out without a physical location for business operations have led to the emergence of the permanent establishment, sometimes known as “nexus.” This circumstance necessitates the determination of the appropriate workplace for income attribution. The rapid evolution of the digital economy demands adaptations in workplace definitions and tax administrations to align with these new realities. Additionally, it introduces challenges in areas such as revenue sharing related to data. The cross-border transfer and utilisation of data present complexities for tax systems adjusting to these dynamic processes. Taxation uncertainty arises from the nature of the income generated and the applicable tax.

The main challenges regarding indirect taxes revolve around VAT, although problems exist with stamp duty and customs duty. Difficulties in VAT collection arise from consumers’ widespread use of e-commerce and online shopping from foreign countries. The difficulty in collecting VAT arises from businesses intentionally structuring their trades to exploit thresholds and the need for more information about the parties involved in the trade of digital goods. Furthermore, the presence of digital intermediaries may escalate the likelihood of double taxation. Consequently, the tax complexities associated with the digital economy are intricate and diverse. The uncertainty about the permanent establishment, data, and the characterisation of income, particularly the challenges faced by VAT in adapting to the rapid growth of e-commerce, require solutions at the international level.

International organisations, particularly the OECD and the EU, have conducted specific studies. However, the deepening of trade relations between countries and the expansion of the digital economy have further complicated the taxation landscape. This complexity has resulted in countries experiencing tax losses, and revenues generated from digital economic activities cannot be effectively taxed. Countries are actively searching for solutions to address the challenges of taxing economic activities in the context of growing digital technologies. Nevertheless, to comprehensively resolve these challenges, it is crucial

to underline the role of international cooperation and the establishment of standards. This collective action is paramount in addressing the complex issue of taxing the digital economy.

The intangible nature of the digital economy has motivated the OECD to take initiatives for advisory decisions on this matter. The most significant initiative aimed at identifying problems and proposing solutions to mitigate tax losses caused by digitalisation is the project to combat international tax avoidance known as “Base Erosion and Profit Shifting (BEPS)”.

As part of the finalisation of the BEPS Action Plan, outlined in the 2015 OECD Final Report, 15 action plans were identified. Specifically, Action Plan 1 is envisaged to be integrated with adapting the Permanent Establishment (PE) circumstance (Action Plan 7), reviewing and improving CFC rules (Action Plan 3), aligning the value creation basis and transfer pricing outcomes (Action Plans 8-10), and addressing harmful tax practices (Action Plan 5). It also addresses critical issues such as permanent establishment and VAT.

The EU has publicised two significant studies, namely the Lisbon Strategy and the Europe 2020 Strategy, to eliminate barriers to cross-border digital economic activities. These strategies outline specific roadmaps for the EU to harness the full potential of ICT in fostering innovation, economic growth, and employment. Notably, the Digital Single Market Strategy, the MOSS, and regulations addressing the fair taxation of the digital economy constitute crucial measures in the EU’s endeavours to encourage and regulate cross-border digital economic activities.

Furthermore, through UNCTAD, the UN organises numerous meetings and conducts studies to establish an international consensus on the taxation of the digital economy. For this purpose, it creates expert groups and addresses countries’ statistical information needs. Similarly, a report published by the WTO in its 2020 study underscores its role in facilitating international cooperation, mitigating adverse spillovers in national policies, and enhancing the effectiveness of pursuing digital development and technological innovation.

OECD or non-OECD member countries have made some arrangements in their legislation in multilateral tax treaties, considering the recommendations in the OECD report. In the case of Türkiye, there are several legal initiatives for the taxation of the digital economy. In this context, as a result of the OECD’s BEPS action plan, the studies developed

within the scope of the EU harmonisation process and different requirements, Türkiye has made and continues to make some regulations in domestic law.

The regulations introduced in Turkish tax law concerning the infrastructure and taxation of the digital economy play an essential role in adapting to the global economic landscape. In this context, there are essential legislative arrangements regarding strengthening the digital infrastructure and protecting personal data. Pertinent laws, including the Law on Electronic Communication, Electronic Signature Law, Law on Consumer Protection, and the Law on the Regulation of Electronic Commerce, have been enacted alongside various amendments and regulations. There are detailed studies on the Protection of Personal Data.

Primary adjustments for the taxation of the digital economy have been implemented within the framework of the BEPS Action Plan, in VAT legislation, and through the enactment of the Digital Service Tax. Regulations related to critical areas outlined by the OECD, especially BEPS Actions 3, 5, 7, 8, and 10, hold significance. Specific provisions have been incorporated through the new Draft Turkish Profit Tax Law to address the artificial avoidance of permanent establishment status as part of “Prevention of Artificial Avoidance of Permanent Establishment Status” (Action 7). Concerning “Review and Improvement of Controlled Foreign Corporation Rules” (Action 3), Türkiye specific CFC rules have been proposed to enhance the existing regulations, responding to the relevant demands effectively. In the context of “Addressing Harmful Tax Practices” (Action 5), measures have been taken to prevent harmful tax practices.

Lastly, regarding “Harmonisation of the Value Creation Basis and Transfer Pricing Results” (Actions 8-10), particularly in the “Draft General Communiqué on Disguised Profit Distribution through Transfer Pricing” (Serial No. 3), additional explanations have been introduced, rectifying deficiencies, clarifying interpretational ambiguities in existing communiqués, and addressing incorrect examples. New documentation rules, including “country-based reporting”, and regulations for incorporating cost contribution agreements and additional comparability factors into the legislation have been implemented by the OECD’s BEPS Action Plan, aligning with the updated Transfer Pricing Guidelines by the OECD.

Several adjustments have been implemented in Turkish tax legislation to address VAT issues in the taxation of digital economy activities. Notably, an amendment to Article 9 of the VAT Law in 2017 and the “Communiqué Amending the General Implementation Communiqué on Value Added Tax (Serial No: 17)” introduced a provision stating that services provided electronically to individuals not subject to VAT in Türkiye, by entities lacking residence, workplace, business centre and legal centre, in Türkiye, are now subject to VAT. The responsibility for declaring and paying this VAT falls on the service providers. In this context, enhancing the efficiency of VAT collection involves tackling issues such as the classification of services related to the digital economy, determining applicable VAT rates, and defining procedures for tax audits. Additionally, it is crucial to boost international administrative cooperation and mutual information sharing globally, especially regarding reforms aimed at enhancing the effectiveness of VAT collection for low-value goods imports. Furthermore, following an amendment in the General Communiqué on Tax Procedure Law, identifying revenues from international companies selling content and services online simplifies VAT collection on such revenues.

The digital service tax practice, initiated in France among EU countries, has been adopted by other nations and was implemented in Türkiye on March 1, 2020. According to available data, Türkiye has the highest digital service tax rate among countries. Reports indicate that EU countries’ average digital service tax rate is around 3%. The OECD average is also below the digital service tax rate applied in Türkiye. As multinational companies are obligated to pay taxes, such as the digital service tax, in all countries where they operate globally, restricting or terminating their operations in Türkiye may diminish Türkiye’s tax capacity. Consequently, potential international investors may not consider Türkiye for new investments, making international tax competition unfavourable to Türkiye.

This study addresses the taxation of the digital economy, especially the issues arising in this context. Since this field is still relatively new, the studies presented must be deemed sufficient. However, the continuity of research and the authorities’ determination are essential. The studies were conducted in Türkiye, and some proposed solutions have been discussed. The critical point here is that the domestic practices of any country, including Türkiye, will likely be insufficient to resolve these issues. Therefore, implementations in this regard should be approached within the framework of international cooperation.

Moreover, the COVID-19 pandemic has intensified the global inclination towards digitalisation and compelled nations to transform. Given that this emerging economic landscape poses a high risk of tax evasion and tax avoidance driven by taxation desires, countries are anticipated to persist in their quest for solutions.

In conclusion, when considering the uniqueness and topicality of the digital economy alongside the limited academic studies on the subject, it is hoped that this study will contribute to the literature and serve as a valuable resource for future research.



REFERENCES

- 193 sayılı Gelir Vergisi Kanunu, R.G. T. 06/01/1961, S. 10700.
- 213 sayılı Kurumlar Vergisi Kanunu, R.G. T. 10/1/1961, S. 10703.
- 213 sayılı Vergi Usul Kanunu, R.G. T. 4/1/1961, S. 1073.
- 3065 sayılı Katma Değer Vergisi Kanunu, R.G. T. 2/11/1984, S. 18563.
- 4077 sayılı Tüketicinin Korunması Hakkında Kanun, R.G. T. 28/11/2013, S. 28835.
- 475 sayılı Mal ve Hizmetlere Uygulanacak Katma Değer Vergisi Oranlarının Tespitine İlişkin Kararda Değişiklik Yapılmasına Dair Cumhurbaşkanı Kararı, R.G. T. 19/12/2018, S. 30630.
- 476 sayılı Cumhurbaşkanı Kararının Eki, R.G. T. 18/12/2018, S. 30630.
- 5070 sayılı Elektronik İmza Kanunu, R.G. T. 23/01/2004, S. 25355.
- 5520 sayılı Kurumlar Vergisi Kanunu, R.G. T. 21/6/2006, S. 26205.
- 5651 sayılı İnternet Ortamında Yapılan Yayınları Düzenleme Ve Bu Yayınlar Aracılığıyla İşlenen Suçlarla Mücadele Etme Hakkında Kanun, R.G. T. 23/05/2007, S. 26530.
- 5809 sayılı Elektronik Haberleşme Kanunu, R.G. T. 10/11/2008, S. 27050.
- 6098 sayılı Türk Borçlar Kanunu, R.G. T. 04/02/2011, S. 27836.
- 6502 sayılı Tüketicinin Korunması Hakkında Kanunu, R.G. T. 28/11/2013, S. 28835.
- 6563 sayılı Elektronik Ticaretin Düzenlenmesi Hakkında Kanun, R.G. T. 5/11/2014, S. 29166.
- 6698 sayılı Kişisel Verilerin Korunması Kanunu, R.G. T. 7/4/2016, S. 29677.
- 7194 sayılı Dijital Hizmet Vergisi İle Bazı Kanunlarda Ve 375 Sayılı Kanun Hükmünde Kararnamede Değişiklik Yapılması Hakkında Kanun, R.G. T. 5/12/2019, S. 30971.
- Agrawal, S. and Das, M. L. (2011). “*Internet of Things - A ParadigmShift of FutureInternet Applications*” International Conference on CurrentTrends in Technology, NuiCONE, Institute of Technology, NirmaUniversity, Ahmedabad, India.
- Akbulut, M. and Korlu, R. (2023, 15-18 March). *Türkiye ve Dünya’da Dijital Hizmet Vergisi ve Değerlendirilmesi*. 3rd International Symposium of Scientific Research and Innovative Studies (ISSRIS’23). Balıkesir, Türkiye.
- Akçura, A. (2021,19 January). Dijital Hizmet Vergisi... Ülkeler Nasıl Uyguluyor... ABD Nasıl Değerlendiriyor?. *Deloitte*. Accessed on 23 October 2022 from <https://www.verginet.net/dtt/1/digital-hizmet-vergisi-abd-degerlendirmesi.aspx>

- Akkaya, H. and Gerçek, A. (2019). OECD ve Seçilmiş Bazı Ülkelerde Dijital Ekonominin Vergilendirilmesi Türkiye için Çıkarımlar. *International Journal of Public Finance*, 4(2), 168.
- Akses, S. (2015). AB’de Dijital Tek Pazar’ın Oluşturulmasına Doğru. *İktisadi Kalkınma Vakfı*, 1-10.
- Akter, S. and Fosso Wamba, S. (2016). Big data analytics in e-commerce: A systematic review and agenda for future research. *Electronic Markets*, 26, 173-194.
- Akyazı, H. and Kalça, A. (2003). Yeni Ekonomi ve İktisat Bilimi. *Liberal Düşünce Dergisi*, 29, 221- 242.
- Albright, B. (2016). 3D Printing and Taxes, Digital Engineering. Accessed on 5 December 2023 from <https://www.digitalengineering247.com/article/3d-printing-and-taxes>
- Alliston, M. (2020). The UK’s Digital Services Tax: What’s New. *Tax Journal*, 1484, 24.
- Alrubaiee, L.S., Alshaibi, H., and Al-bayati, Y. (2012). Relationship between B2B E-Commerce Benefits, E-Market-place Usage and Supply Chain Management. *Middle East University, Global Journal of Management and Business Research*, 12(9).
- Altenburger, P., and Czajkowski, J.J. (2020). How to Tax the Digital Economy.
- Arıtı Erdem, İ. and Odabaş, H. (2023). Transfer Pricing Documentation and The CbCR under BEPS Action 13: an Analysis of Turkish Practice. *TCA Journal/Sayıştay Dergisi*, 34(131), 635-667.
- Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A. and Stoica, I. (2010). A View of Cloud Computing. *Communications of the ACM*, 53(4), 50- 58.
- Arnold, B.J. (2020). Article 5: Permanent Establishment- Global Tax Treaty Commentaries, Global Topics. IBFD.
- Artar, Y. (2019). *Dijital Ekonomide Vergilendirme, Finansal Raporlama ve Denetime İlişkin Sorunlar: Türkiye Açısından Çözüm Önerileri* [Doctoral Thesis] İstanbul Ticaret Üniversitesi Sosyal Bilimler Enstitüsü.
- Aslam, A. and Shah, A. (2017). Taxation and the Peer-to-Peer Economy in Gupta, Sanjeev, Michael Keen, Alpa Shah, and Genevieve Verdier (Eds.), in *Digital Revolutions in Public Finance*, Washington D.C.: International Monetary Fund.
- Ault, H. J., Schon, W. and Shay, S. E. (2014). Base Erosion and Profit Shifting: A Roadmap for Reform. *Bulletin for International Taxation*, 68, 275-279.
- Avi-Yonah, R. S. (1997). International Taxation of Electronic Commerce, *Tax Law Review* 52, 507-555.
- Avi-Yonah, R. S. (2007). *International Tax as International Law*. Cambridge University Press.

- Bal, A. and Gutierrez, C. (2015). Taxation of the Digital Economy. Cotrut, M. (Ed), in International Tax Structures in the BEPS Era: An Analysis of Anti-Abuse Measures (2, 249- 280). IBFD.
- Basu, S. (2008). International Taxation of E-Commerce: Persistent Problems and Possible Developments. *Journal of Information Law and Technology*, (1).
- Ber, H. (2018). (2018, December 17). Dijital Ekonominin Vergilendirilmesi Sorunsalına Genel Bir Bakış. Accessed on 3 October 2023 from <https://vergialgi.com/dijital-ekonominin-vergilendirilmesi-sorunsalina-genel-bir-bakis>
- Biyan, Ö. (2014). Elektronik Ticaret Kanunu'nun Getirdikleri: Bazı Hususlarda Görüş Paylaşımı. *Legal Mali Hukuk Dergisi*, 120, 5-34.
- Boccia, F. and Leonardi, R. (2016). The challenge of the digital economy. Markets, Taxation and Appropriate Economic Model. Rome, Italy. LUISS University.
- Brand Finance (2023). Global 500 2023: The annual report on the most valuable and strongest global brands. Brand Finance. Accessed on 1 December 2023 from <https://brandirectory.com/rankings/global>
- Budak, T. (2018). *Dijital Ekonominin Vergilendirilmesi* (1. Edition). On İki Levha Yayıncılık.
- Bukht, R., and Heeks, R. (2017). Defining, conceptualising, and measuring the digital economy. *Development Informatics working paper*, (68).
- Bunn, D. (2020). *Digital Taxation Around the World*. Tax Foundation, United States.
- Campbell-Kelly, M., Garcia-Swartz, D., Lam, R. and Yang, Y. (2015). Economic and business perspectives on smartphones as multi-sided platforms. *Telecommunications Policy, Elsevier*, 39(8), 717-734.
- Canpolat, Ö. (2001). E-Ticaret ve Türkiye'deki Gelişmeler, Ankara: Türkiye Cumhuriyeti Sanayi ve Ticaret Bakanlığı Hukuk Müşavirliği.
- Centore, P. and Sutich, M. T. (2014). Taxation and Digital Economy: Europe Is Ready. *Intertax*, 42(12), 784-787.
- Chaffey, D. (2015) *Digital Business and E-Commerce Management*. Pearson, New York.
- Chan, C. W. (2000). Taxation of Global E-Commerce on the Internet: The Underlying Issues and Proposed Plans, *Minn. J. Global Trade*, 233.
- Chen, C. (2015). Taxation of Digital Goods and Services. *NYU Annual Survey of American Law*, 70(421), 421-478.
- Cleff, E., B. (2007). Privacy issues in mobile advertising. *International Review of Law, Computers & Technology*, 21(3), 225 - 236
- Clinton, W.J. and Gore, A. (1999). *Global Elektronik Ticaret, Çev: V. Bozkurt* (1. Edition). Alfa Yayınları.

- Coin Market Cap. (2023). Top Cryptocurrency Spot Exchanges. Accessed on 1 November 2023 from <https://coinmarketcap.com/rankings/exchanges/>
- Colin, N., Landier, A., Mohnen, P. and Perrot, A. (2015). The Digital Economy. *Notes du conseil d'analyse économique*, 26, 1-12.
- Collins, H., C., Kemsley, D. and Shackelford, D., A. (1997). Transfer pricing and the persistent zero taxable income of foreign-controlled U.S. corporations. *The Journal of the American Taxation Association*, (19), 68-71.
- Consulta (2020, 20 June). Transfer Fiyatlandırması Uygulamasında Yeni Ve Önemli Yükümlülükler. Consulta. Accessed on 3 December 2023 from <https://www.consulta.com.tr/tr/sirkuler/transfer-fiyatlandirmasi-uygulamasinda-yeni-ve-one/178>
- Çelikkaya, A. (2022). Zararlı Vergi Uygulamalarının Gelişimi. *Gümrük ve Ticaret Dergisi*. 9(28), 12- 26.
- Çetin Gerger, G. ve Gerçek, A. (2016). Elektronik Ticaretin Vergilendirilmesi Açısından Katma Değer Vergisinin Uygulama Sorunlarının Değerlendirilmesi. *International Journal of Public Finance*, 1, 61- 74.
- Çolak, M. (2020). Elektronik Vergileme Hukuku (1. Edition). Seçkin Yayıncılık.
- Değirmendereli, A. (2020). *Türk Vergi Sistemi* (1st Edition). Seçkin Yayınevi.
- Deloitte (2020). Taxing to the Cloud. Deloitte. Accessed on 3 November 2023 from <https://www2.deloitte.com/content/dam/Deloitte/br/Documents/tax/deloitte-taking-tax-to-the-cloud.pdf>
- Diclehan, B. (2016). Matrah Aşındırma Yoluyla Kar Aktarımı ve Türkiye Uygulamaları. KPMG. Accessed on 1 January 2024 from <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/tr-sorumlu-vergicilik-basak-diclehan.pdf>
- Dijital Hizmet Vergisi Uygulama Genel Tebliği, R.G. T. 20/03/2020, S. 31074.
- Directive 95/46/EC of The European Parliament And of the Council (1995). Accessed on 4 January 2024 from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31995L0046:en:HTML>
- Doernberg, R. L. (2000). Electronic Commerce: Changing Income Tax Treaty Principles A Bit?, *Tax Notes*, 1625 (2000).
- Doğanay, K. and Odabaş, H. (2022). Kripto Varlıkların Vergilendirilmesinde Bir Politika Önerisi Olarak Birleşik Krallık Sisteminin Değerlendirilmesi. *International Journal of Applied Economic and Finance Studies*, 7(2).
- Dwyer, T. (2000). 'Harmful' tax competition and the future of offshore financial centres, such as Vanuatu. *Pasific Economic Bulletin*, 15(1), 48-69.
- Elektronik Tebligat Sistemi Genel Tebliği (Sıra No: 1), R.G. T. 25/01/2018, S. 30312.

- Elektronik Ticaretin Düzenlenmesi Hakkında Kanunda Değişiklik Yapılmasına Dair Kanun, R.G. T. 1/7/2022, S. 31889.
- Elektronik Ticarete Hizmet Sağlayıcı ve Aracı Hizmet Sağlayıcılar Hakkında Yönetmelik, R.G. T. 26/08/2015, S. 29457.
- Endo, T. (2017). *Taxation in a Global Digital Economy*. Linde Verlag GmbH Publishing.
- Eroğlu, S. (2023, 10 February). Verbis Nedir?. Sinan Eroğlu. Accessed on 27 October 2023 from <https://www.sinaneroglu.av.tr/verbis-nedir/#:~:text=kuruma%20bildirmekle%20yükümlüdürler.-,Verbis%20Kimleri%20Kapsıyor%3F,kişiler%2C%20verbis%20kapsamında%20yer%20alır>
- Ertaş, B. L. (2016, June 17). Bitcoin Teslimlerinde Vergi Var Mı?. Bilal Levent Ertaş. Accessed on 3 October 2022 from <http://bilallevent.com/bitcoin-teslimlerinde-vergi-var-mi/>
- European Commission (2016). VAT Aspects of cross-border e-commerce - Options for modernisation, Final report – Lot 2. European Commission. Accessed on 28 February 2023 from https://taxation-customs.ec.europa.eu/system/files/2016-12/vat_aspects_cross-border_e-commerce_final_report_lot2.pdf
- European Commission (2017a). Creating a Digital Single Market Bringing Down Barriers to Unlock Online Opportunities. Accessed on 27 January 2023 from https://ec.europa.eu/commission/presscorner/api/files/attachment/7610/Factsheet_1_PORTABILITY_FINAL.pdf
- European Commission. (2017b). The Digital Single Market: State of Play. Accessed on 27 January 2023 from https://www.ewi-vlaanderen.be/sites/default/files/imce/digital_single_market_strategy_state_of_play.pdf
- European Commission. (2019). Proposal For a Regulation of The European Parliament and of The Council on Markets in Crypto-Assets, and Amending Directive (EU) 2019/1937.
- European Commission. (2024). The Digital Services Act. Accessed on 10 March 2024 from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/digital-services-act_en
- Eurostat (2018). Internet Advertising of Businesses-Statistics on Usage of Ads. Accessed on 15 March 2024 from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Internet_advertising_of_businesses_-_statistics_on_usage_of_ads
- EY (2015). Cloud Taxation Issues and Impacts, Accessed on 3 October 2023 from <https://pdf4pro.com/view/cloud-taxation-issues-and-impacts-ey-united-states-3cb5af.html>
- Filippov, V. M., Chursin, A. A., Ragulina, J. V., and Popkova, E. G. (2019). *The Cyber Economy. Opportunities and Challenges for Artificial Intelligence in the Digital Workplace*. Springer Nature Switzerland AG.

- Finansal Hizmetlere İlişkin Mesafeli Sözleşmeler Yönetmeliği, R.G. T. 31/01/2015, S. 29253.
- Fuchs, C. (2018). *The online advertising tax as the foundation of a public service internet*. University of Westminster Press.
- Fukuyama, M. (2018). *Society 5.0: Aiming for a new human-centred society*. Japan Spotlight, 27, 47–50.
- Ganne, E. and Lundquist, K., (2019). The digital economy, GVCs and SMEs. *World Trade Organization (ed.), Global Value Chain Report: 2019: Technological Innovation, Supply Chain Trade, and Workers in a Global World, Chapter 6*, 121-180. WTO, Geneva.
- Georgieva, E. A., Akimbaeva, K. T., Askarova, Z. A., and Kyzdarbekova, A. S. (2020). Digital Economy–An Element of Information. *Farabi Journal of Social Sciences*, 6(2), 44-51.
- Global Digital Finance (GDF). (2018). Code of Conduct Taxonomy for Cryptographic Assets.
- Gülhan, N. and Turunç, S. (2015). Dijital Ekonominin Vergilendirilmesinde Yaşanan Sorunlara Yönelik Son Dönemde Uluslararası Vergi Alnında Yaşanan Gelişmeler. *Vergi Dünyası Dergisi*, 409, 166-176.
- Güngör, M. (2021). Dijital Hizmet Vergisi. *Danıştay Dergisi*, 152, 257-294.
- H. Li and J. D. Leckenby (2004). Internet Advertising Formats and Effectiveness. An Invited Chapter for Thorson and Schuman. Accessed on 24 January 2024 from https://brosephstalin.files.wordpress.com/2010/06/ad_format_print.pdf
- Hadzhieva E. (2016, June). Tax Challenges in The Digital Economy. European Parliament, Policy Department A: Economic and Scientific Policy. Accessed on 20 January 2022 from https://www.europarl.europa.eu/RegData/etudes/STUD/2016/579002/IPOL_STU%282016%29579002_EN.pdf
- Hardesty, E. D. (2002). *Electronic Commerce: Taxation and Planning*, Warren Gorham & Lamont, USA.
- Hebous, S. (2021). "Chapter 6 Has Tax Competition Become Less Harmful?". In *Corporate Income Taxes under Pressure*. USA: International Monetary Fund.
- Hilbert, M.R. (2001). *From Industrial Economics to Digital Economics: An Introduction to The Transition*. Santiago de Chile: CEPAL.
- Hodžić, S. (2018). Tax Administrative Challenges of The Digital Economy: *The Croatian Experience*. *Journal of Tax Research*, 16(3), 762-779.
- Holmes K. (2014). *International Tax Policy and Double Tax Treaties: An Introduction to Principles and Application* (2. Revised Edition) Amsterdam: IBFD.

- Houben, R., and Snyers, A. (2020). Crypto-assets. *Key developments, regulatory concerns, and responses. Policy Department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies. PE, 648, 13.*
- Iansiti, M. (2021). Assessing the Strength of Network Effects in Social Network Platforms. *Harvard Business School Working Paper, 21-086.*
- IDC, 2021. Cloud Computing. Accessed on 24 January 2022 from <https://www.idc.com/getdoc.jsp?containerId=prUS48283921>
- Innova, 2021. Dijital Dönüşüm, Nesnelerin İnterneti. Accessed on 28 January 2023 from <https://www.innova.com.tr/tr/blog/dijital-donusum-blog/nesnelerin-interneti-iot-nedir>
- Işık, H. (2018). Dijital Ekonominin Vergi Hukukundaki İşyeri Kavramına Etkileri. *Vergi Sorunları Dergisi, 356, 42- 62.*
- İTO (2006). İnternet Reklamcılığı E-Reklam, Bilişim Teknolojileri ve e-Ticaret Şubesi. Accessed on 16 April 2023 from http://docs.neu.edu.tr/staff/ahmet.arnavut/internet%20reklamcılığı_4.pdf
- Johansson, B., Karlsson, C. and Stough, R. (2006). The Emerging Digital Economy. *Entrepreneurship, Clusters and Policy in the Emerging Digital Economy* (1. Edition) Clusters and Policy.
- Jones, B., Seabrook, S., Sciliberto, S. and Jones, G. (2018). Taxing the digital economy, Insight and analysis for the business tax community, 1389.
- Joshi, P. (2020). Does private country by country reporting deter tax avoidance and income shifting? Evidence from BEPS Action Item 13. *Journal of Accounting Research, 58(2), 333-381.*
- Jovanović, M., Dlačić, J., and Okanović, M. (2018). Digitalization and Society's Sustainable Development -Measures and Implications. *Journal of Economics and Business, 36 (2), 905-928.*
- Kagermann, H., Wahlster, W., Helbig, J., (2013). Recommendations for Implementing the Strategic Initiative Industrie 4.0: Securing the Future of German Manufacturing Industry. Final Report of the Industrie 4.0 Working Group. Acatech, Forschungsunion, 4, 13-78.
- Kahraman, A. (2021). Uluslararası Vergilemede Dönüşüm. Accessed on 10 May 2024 from https://www.ey.com/tr_tr/tax/uluslararasi-vergilemede-donusum
- Karlık, R. (2003). *Uluslararası Ekonomi* (1. Edition). Beta Yayınları.
- Katma Değer Vergisi Genel Tebliği (Seri No: 93), R.G. T. 19/01/2005, S. 25705.
- Katma Değer Vergisi Genel Uygulama Tebliğinde Değişiklik Yapılmasına Dair Tebliğ (Seri No: 25), R.G. T. 23/03/2019, S. 30723
- Katma Değer Vergisi Genel Uygulama Tebliğinde Değişiklik Yapılmasına Dair Tebliğ (Seri No: 17), R.G. T. 31/01/2018, S. 30318.

- Katz M.L. and C. Shapiro (1985). *Network Externalities, Competition and Compatibility*. American Economic Review.
- Kemper, A. (2010). Network Effects Valuation Framework For Software Markets. In: Valuation of Network Effects in Software Markets. Contributions to Management Science. Physica-Verlag HD.
- Kişisel Verilerin Silinmesi, Yok Edilmesi veya Anonim Hale Getirilmesi Hakkında Yönetmelik, R.G. T. 28/10/2017, S. 30224.
- Koh, L., Orzes, G., and Jia, F. (2019). The Fourth Industrial Revolution (Industry 4.0): Technologies' Disruption on Operations and Supply Chain Management. *International Journal of Operations and Production Management*, 39 (6-7- 8), 817-828.
- KPMG (2015). Tax professional's guide to cloud. Accessed on 3 November 2023 from <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/co-tmt-3-the-tax-professionals-guide-to-the-cloud.pdf>
- KPMG (2023). Küresel Vergi Anlaşmasına İlişkin Son Gelişmeler. Accessed on 10 May 2024 from <https://legal.com.tr/blog/ekonomi/kuresel-vergi-anlasmagina-iliskin-son-gelismeler/>
- Kudrle, R. (2016). "Tax Havens And The Transparency Wave Of International Tax Legalization". *University of Pennsylvania Journal of International Law*, 19(4), 1153-1182.
- KVKK (2018). Kişisel Verilerin Silinmesi, Yok Edilmesi veya Anonim Hale Getirilmesi Rehberi.
- Leka, E. (2022). *What Should Economists Know About the Cloud? A Literature Review on Digital Economics*, 31st European Conference of the International Telecommunications Society (ITS): Reining in Digital Platforms? Challenging monopolies, promoting competition and developing regulatory regimes. Gothenburg, Sweden.
- Liu, Z. (2022). Principles of Digital Economics. *Springer*, Singapore.
- Magnin, A (2016, 13 May). Network Effects and the New Physics of Digital Media. *Observer*. Accessed on 20 October 2021 from, <https://observer.com/2016/05/network-effects-and-the-new-physics-of-digital-media/>
- Mastar Özcan, P. (2016). Dijital Ekonominin Vergilendirilmesinde Karşılaşılan Sorunlar: BEPS 1 No'lu Eylem Planı Kapsamında Bir Değerlendirme. *Ejovoc (Electronic Journal of Vocational Colleges)*, 6(2), 73-82.
- Mathew, H.L. and Rodrigues, L. L. R. (2018). Prioritizing the Factors Affecting Cloud ERP Adoption – An Analytic Hierarchy Process Approach. *International Journal of Emerging Markets*, 13(6), 1559-1577.

- Meissner, H., Ilsen, R., and Aurich, J. C. (2017). Analysis of Control Architectures in the Context of Industry 4.0. *Procedia College International Pour La Recherche En Productique*, 62, 165-169.
- Mert, H. and Bayar, E. (2020). Digital economy, taxation and problems encountered. *PressAcademia Procedia (PAP)*, 11, 28-33.
- Mesafeli Sözleşmeler Yönetmeliği, R.G. T. 27/11/2014, S. 29188.
- Mesenbourg, T.L. (2001). Measuring the Digital Economy, US Bureau of the Census, Suitland, MD. Accessed on 10 July 2022 from <https://www.census.gov/content/dam/Census/library/working-papers/2001/econ/umdigital.pdf>
- Millar, R. (2016). Looking Ahead: Potential Solutions and the Framework to Make Them Work, *Legal Studies Research Paper*, The University of Sydney, 21.
- Misra, S. C., and Mondal, A. (2011). Identification of a company's suitability for the adoption of cloud computing and modelling its corresponding Return on Investment. *Mathematical and Computer Modelling*, 53(3-4), 504-521.
- Mitrović, D. (2020). Measuring the efficiency of digital convergence. *Economics Letters*, 188 (3).
- Morgan Stanley (2022): Here's why e-commerce growth can stay stronger for longer. Accessed on 10 December 2023 from <https://www.morganstanley.com/ideas/global-ecommerce-growth-forecast-2022>
- Morriss, A., P. and Moberg, L. (2012). Cartelizing Taxes: Understanding the OECD's Campaign Against "Harmful Tax Competition", *Columbia Journal of Tax Law*, 4(1), 1-64.
- Mpofu, F.Y. (2022). Taxation of the Digital Economy and Direct Digital Service Taxes: Opportunities, Challenges, and Implications for African Countries, *Economies*, 10, 219.
- Musgrave, P. B. (1984). Principles for Dividing the State Corporate Tax Base, *The state Corporation Income Tax*.
- Mutlu Kaya, Ö. (2020). Dijital Hizmet Vergisi ve Türkiye Uygulaması. *Maltepe Üniversitesi Hukuk Fakültesi Dergisi*, 2, 447- 478.
- Nadaroğlu, H. (1987). Vergi Sistemimizin Etkinliği, T.C. Anadolu Üniversitesi Yayınları (234), Ankara.
- Nadaroğlu, H. (1998). *Kamu Maliyesi Teorisi*, Beta Basım Yayın, İstanbul.
- Næss-Schmidt, H. S., Ali, D. M., Arias, M. N., Denton, J. and Vync, K. (2012). Simplifying and Modernising VAT in the Digital Single Market for e-Commerce, European Parliament, Accessed on 13 December 2023 from [https://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/492432/IPOL-IMCO_ET\(2012\)492432_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/492432/IPOL-IMCO_ET(2012)492432_EN.pdf)

- OECD (1998). OECD Ministerial Conference A Borderless World: Realising The Potential Of Global Electronic Commerce. Accessed on 22 April 2023 from [https://one.oecd.org/document/SG/EC\(98\)14/FINAL/en/pdf](https://one.oecd.org/document/SG/EC(98)14/FINAL/en/pdf)
- OECD (2001). Taxation and Electronic Commerce: Implementing the Ottawa Taxation Framework Conditions, OECD Publishing, Paris.
- OECD (2009). Empowering E-Consumers: Strengthening Consumer Protection in the Internet Economy, Background Report to the 2009 OECD Conference on E-Commerce. OECD Publishing. Accessed on 4 January 2023 from [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=dsti/cp\(2009\)20/final&doclanguage=en](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=dsti/cp(2009)20/final&doclanguage=en)
- OECD (2013). Action Plan on Base Erosion and Profit Shifting, OECD Publishing, Paris.
- OECD (2014). BEPS: Update on Progress and Next Steps. Accessed on 3 February 2022 from https://www.oecd.org/tax/taxglobal/AdvisoryGroup_DraftAgenda_31Oct_incSpeakers.pdf
- OECD (2015). Addressing the Tax Challenges of the Digital Economy, Action 1 - 2015 Final Report, OECD/G20 Base Erosion and Profit Shifting Project, OECD Publishing, Paris.
- OECD (2016). Enabling the next production revolution: The Future of manufacturing and services –interim report. Accessed on 20 April 2023 from <https://www.oecd.org/mcm/documents/Enabling-the-next-production-revolution-the-future-of-manufacturing-and-services-interim-report.pdf>
- OECD (2017). Model Tax Convention on Income and on Capital: Condensed Version 2017, OECD Publishing, Paris.
- OECD (2019). Members of the OECD/G20 Inclusive Framework. Accessed on 1 January 2024 from, <https://www.oecd.org/tax/beps/inclusive-framework-on-beps-composition.pdf>
- OECD (2020b). Taxing Virtual Currencies: an Overview of Tax Treatments and Emerging Tax Policy Issues. OECD, Paris. www.oecd.org/tax/tax-policy/taxing-virtual-currencies-an-overview-of-tax-treatments-and-emerging-tax-policy-issues.html
- OECD (2020a). OECD Digital Economy Outlook 2020, OECD Publishing, Paris.
- OECD (2021). OECD/G20 BEPS Project, Statement on the Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy, 8 October 2021. Accessed on 1 January 2024 from <https://www.oecd.org/tax/beps/statement-on-a-two-pillar-solution-to-address-the-tax-challenges-arising-from-the-digitalisation-of-the-economy-october-2021.htm>
- Olbert, M. and Spengel, C. (2017). International Taxation in The Digital Economy: Challenge Accepted? *World Tax Journal*, 9(1), 3-46.

- Oredo, J. and Njihia, J. (2014). Challenges Of Cloud Computing İn Business: Towards New Organizational Competencies. *International Journal of Business and Social Science*, 150-160.
- Organ, İ., and Çavdar, F. (2012). Elektronik Ticaretin Vergilendirilmesinde Uluslararası Alanda. *İnternet Uygulamaları ve Yönetim Dergisi*, 63-81.
- Oscar, R., Daniel, M. and Eduardo, F. M. (2015). Empirical Evaluation of a Cloud Computing Information Security Governance Framework. *Information and Software Technology*, 58(2), 44-57.
- Öz, E. and Kara, M. C. (2016). Dijital Vergilendirmeye Küresel Bir Bakış. *Vergi Dünyası Dergisi*, 424, 30-37.
- Öz, N. S. (2004). Devletlerin Vergilendirme Yetkileri Sınırının E-Ticaret Açısından Değerlendirilmesi. *Maliye Dergisi*, 147, 90- 102.
- Özen, Ü. and Sarı, A. (2008). İnternet Reklamcılığı: İnternet Kullanıcılarının İnternet Reklamcılığı Konusundaki Tutum ve Davranışları. *Bilişim Teknolojileri Dergisi*, 1(3), 12.
- Özkan, A. F. (2020). Rekabet Perspektifinden Dijital Hizmet Vergisi. Emek, U. (Ed), *Vergi Düzenlemelerinin Rekabet Süreçlerine Etkileri* (121-161) içinde. Siyasal Kitabevi, Ankara.
- Panichayakorn, T., and Jermsttiparsert, K. (2019). Mobilizing Organizational Performance Through Robotic and Artificial Intelligence Awareness in Mediating Role of Supply Chain Agility. *International Journal of Supply Chain Management*, 8(5), 757-768.
- Pappa, D. and Stergioulas, L.K. (2006). G2C AND C2G: Emerging Principles and Architectures in E-government and E-participation. eGovernment Workshop '06 (eGOV06).
- Peng, W. (2016). Multinational Tax Base Erosion Problem of The Digital Economy. *Modern Economy*, 7(3), 345-352.
- Petit, N. (2020). *Big tech and the digital economy: The moligopoly scenario* (1. Edition). Oxford University Press. Oxford.
- Pinto, D. (2017). Options to Address the Direct Tax Challenges Raised by the Digital Economy-A Critical Analysis. *Canadian Tax Journal*, 65(2), 291-331.
- PricewaterhouseCoopers (PwC). (2016). 3 Seri No.lu Transfer Fiyatlandırması Yoluyla Örtülü Kazanç Dağıtımı Hakkında Genel Tebliğ Taslağının Getirdiği Yenilikler. <https://www.pwc.com.tr/tr/Hizmetlerimiz/vergi/vergi-bultenleri/3-seri-nolu-transfer-fiyatlandirmasi-yoluyla-ortulu-kazanc-dagitimi-hakkinda-genel-teblig.pdf> Accessed on 20 February 2023 from
- PricewaterhouseCoopers (PwC). (2017). BEPS Action Plan 1: The Digital Economy. Accessed on 1 January 2024 from, <https://www.pwc.com/gx/en/services/tax/tax-policy-administration/beps/the-economy.html>

- Quaderno Tax Resources (2018). The Ultimate Guide to EU VAT for Digital Taxes, Accessed on 22 April 2023 from <https://www.quaderno.io/digital-tax-guides/eu-vat-guide>
- Republic of Türkiye Ministry of Trade (2015, July 15). Ticari İletişim ve Ticari Elektronik İletiler Hakkında Yönetmelik Resmi Gazetede Yayımlanarak Yürürlüğe Girdi. Accessed on 15 November 2023 from. <https://ticaret.gov.tr/haberler/ticari-iletisim-ve-ticari-elektronik-ileteler-hakkinda-yonetmelik-resmi-gazetede-yayimlanarak-yururluge-girdi>
- Republic of Türkiye Ministry of Trade (2022, October 19). Mesafeli Sözleşmeler Hakkında Bilgilendirme. Accessed on 15 November 2023 from. <https://tuketici.ticaret.gov.tr/yayinlar/tuketici-bilgi-rehberi/mesafeli-sozlesmeler-hakkinda-bilgilendirme>
- Republic of Türkiye Ministry of Trade (2022). Dünya Ticaret Örgütü (DTÖ-WTO). Accessed on 27 October 2023 from <https://disiliskiler.ktb.gov.tr/TR-22157/dunya-ticaret-orgutu-dto-wto.html>
- Republic of Türkiye Ministry of Trade (2023, April 18). Elektronik Ticaret Bilgi Sistemi (ETBİS). Accessed on 24 December 2023 from <https://ticaret.gov.tr/ic-ticaret/elektronik-ticaret/elektronik-ticaret-bilgi-sistemi-etbis>
- Rosen, M (2019). Platform Business Model of the Digital Economy. Accessed on 27 October 2022 from <https://www.bptrends.com/bpt/wp-content/uploads/01-08-2019-COL-Platform-Business-Model-Rosen.pdf>
- Rukundo, S. (2020). Addressing the Challenges of Taxation of the Digital Economy: Lessons for African Countries, *ICTD Working Paper* 105, 1-31.
- Ryan, J. (2021). *Crypto Asset Investing in the Age of Autonomy* (1. Edition). Wiley. Hoboken, New Jersey.
- Salesforce, (2020). The Top 5 Economic Benefits of Cloud Computing. Accessed on 24 June 2023 from <https://www.salesforce.com/eu/blog/economic-benefits-cloud-computing/>
- Saraçoğlu, F. and Kahraman, B. (2020). Dijital Hizmet Vergisi Üzerine Değerlendirmeler. *Vergi Sorunları Dergisi*, 376, 9-17.
- Sasseville, J. and Skaar A. A. (2010) The Definition of Permanent Establishment: Eroding or Evolving? IFA Canada. Accessed on 27 October 2022 from <https://ifacanada.org/wp-content/uploads/attachments/T%20LectureshipMaterials2010.pdf>
- Schneier, B. (2009). Architecture of privacy. *ieee seCurity & PrivaCy*, 7(1).
- Schulze, C., Baumgartner, J., and Europäische Kommission Generaldirektion Informationsgesellschaft. (2001). *Don't panic! : Do e-commerce ; a beginner's guide to European law affecting e-commerce*. European Commission's Electronic Commerce Team.

- Şen, H. and Sağbaşı, İ. (2016). Vergi Teorisi ve Politikası (Revised and Partially Expanded 2. Edition) Kalkan Matbaacılık, Ankara.
- Shakow, D. (2013). The Taxation of Cloud Computing and Digital Content. *Faculty Scholarship at Penn Carey Law*, 475.
- Śledziwska, K., and Włoch, R. (2021). *The economics of digital transformation: The disruption of markets, production, consumption, and work*. Routledge.
- Solms, R., and Niekerk, J. (2013). From information security to cyber security, *Computer & Security*, 38, 97-102.
- Statista (2023). E-commerce as a percentage of total retail sales worldwide from 2015 to 2027. Accessed on 10 December 2023 from <https://www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/>
- Stimson, R.J. (2006). The Digital Divide: A Review of Socioeconomic and Spatial Distributional Issues in ICTs. Johansson, B., Karlsson, C. and Stough, R. (Eds), in *The Emerging Digital Economy Entrepreneurship, Clusters, and Policy* (293- 329). Springer.
- Subashini, S., and Kavitha, V. (2011). A survey on security issues in service delivery models of cloud computing. *Journal of Network and Computer Applications*, 34(1), 1-11.
- Szozda, N. (2017). Industry 4.0 and Its Impact on the Functioning of Supply Chains. *Scientific Journal of Logistics*, 13(4), 401-414.
- Tapscott, D. (1995). *The Digital Economy: Promise and Peril In The Age of Networked Intelligence* (1. Edition). McGraw-Hill.
- Tayaksi, C., Ada, E., and Kazançoğlu Y. (2016). Bulut Üretim: İşlemler Yönetiminde Yeni Bir Bulut Bilişim Modeli. *Ege Akademik Bakış Dergisi*, 16, 71-84.
- Tibbits, S., McKnelly, C., Olguin, C., Dikovsky, D. and Hirsch, S. (2014). *4D Printing and Universal Transformation*. ACADIA Design Agency Conference, Los Angeles, United States.
- Turak, Y. (2015). Nesnelerin interneti ve güvenliği. Accessed on 28 January 2023 from <http://www.yigitturak.com/wp-content/uploads/IoTGuvenligi.pdf>
- Turcan, V., Gribincea, A., and Birca, I. (2014). Digital economy premise for economic development in the 20th century. *Economie si Sociologie: Revista Teoretico-Stiintifica*, (2), 109-115.
- Turley, C., Chamberlain, D. and Petriccione, M. (2017). A New Dawn for the International Tax System: Evolution from past to future and what role will China play?, IBFD, 2017, Online Books Last Reviewed: 31 July 2016.
- TÜRMOB (2016, April). Kurumlar Vergisi Beyanname Düzenleme Rehberi. Accessed on 20 April 2023 from <https://www.turmob.org.tr/ekutuphane/Read/5b9bfbf4-5f34-4fd4-8132-29736aec12b4>

- TÜSİAD (2022). E-ticaretin Öne Çıkan Başarısı, Tüketici Davranışlarında Değişim ve Dijitalleşme. Accessed on 16 April 2023 from <https://tusiad.org/tr/yayinlar/raporlar/item/10915-e-ticaretin-one-cikan-basarisi-tuketici-davranislarinda-degisim-ve-dijitallesme-deloitte-digital>
- UİB (2017, June). Yapay Zeka ve Yeni Teknolojiler. Uludağ İhracatçı Birlikleri Genel Sekreterliği Ar&Ge Şubesi. Accessed on 18 April 2023 from <https://uib.org.tr/tr/kbfile/yapay-zeka-ve-yeni-teknolojiler>
- UNCTAD. (2018). Measuring E-commerce and the Digital Economy. United Nations. Accessed on 27 October 2023 from. https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Measurement.aspx
- UNCTAD (2021). Digital Economy Report 2021 Overview. United Nations. Accessed on 27 October 2023 from. https://unctad.org/system/files/official-document/der2021_overview_en_0.pdf
- Unhelkar, B. (2008). *Handbook of Research in Mobile Business: Technical, Methodological and Social Perspectives: Technical, Methodological and Social Perspectives* (2. Edition). IGI Global Publishing.
- U.S. Department of the Treasury (2024). The United States, Austria, France, Italy, Spain, and the United Kingdom Announce Extension of Agreement on the Transition from Existing Digital Services Taxes to New Multilateral Solution Agreed by the G20/OECD Inclusive Framework. Accessed on 10 May 2024 from <https://home.treasury.gov/news/press-releases/jy2098>
- Vaidya, S., Ambad, P., and Bhosle, S. (2018). Industry 4.0 – A Glimpse. *Procedia Manufacturing*, 20, 233-238.
- Valderrama, M. (2020). Policy Note–The Study of the BEPS 4 Minimum Standards As A Legal Transplant: A Methodological Framework. *Intertax*, 48(8/9), 719-732.
- Van Duy, L. (2023). A Review of Digital Economy and Digital Economics. *Vietnam Journal of Agricultural Sciences*, 6(1), 1745-1753.
- Verhoef, P. C., Kooge, E. and Walk, N. (2016). *Creating Value with Big Data Analytics*, Routledge, London.
- Veri Sorumluları Sicili Hakkında Yönetmelik, R.G. T. 30/12/2017, S. 30286.
- Vertex (2022). Software in the cloud: What are the tax implications?. Accessed on 10 August February 2023 from. <https://www.vertexinc.com/resources/resource-library/software-cloud-what-are-tax-implications>
- Walker, E. and Collins, J. (2021). Australia: Taxing the Digital Economy. Accessed on 15 February 2024 from <https://www.mondaq.com/australia/transfer-pricing/1076760/taxing-the-digital-economy>
- Welfens, P. J., and Weske, M. (Eds.). (2007). Digital economic dynamics: Innovations, networks and regulations. Springer Science & Business Media.

- Weidmann, M. (2015). The New EU VAT Rules on the Place of Supply of B2C E-Services: Practical Consequences. *EC Tax Review*, 24(2), 105-118.
- Westin, A. R. (2000). *International Taxation of Electronic Commerce*, Kluwer Law International, Netherlands.
- WTO (2019). Work Programme on Electronic Commerce, General Council Decision (19-8532), World Trade Organisation: Geneva.
- WTO (2001). Doha WTO Ministerial 2001: Ministerial Declaration, WT/MIN(01)/DEC/1, World Trade Organisation: Geneva.
- Wu, T. N. (1999). Tax Havens, The George Washington University, Washington DC, Minerva Program. Accessed on 5 February 2023 from <https://www2.gwu.edu/~ibi/minerva/Fall1999/Wu.Tun.pdf>
- Yaltı, B. (2003). *Elektronik Ticarete Vergilendirme* (2. Edition). Der Yayınları.
- Yampolskiy, M., Skjellum, A., Kretzschmar, M., Overfelt, R., Sloan, K. and Yasinsac, A. (2016). Using 3D printers as weapons. *International Journal of Critical Infrastructure Protection*.
- Yılmaz, G. H. and Akçura Değer, A. (2018). Dijital İktisadi Faaliyetlerde İşyeri Paradoksu ve Vergisel Boyutu. Deloitte. Accessed on 10 May 2023 from <https://www.verginet.net/dtt/18/DijitalIktisadiFaaliyetlerdeIsyeriParadoksuveVergiseIBoyutu.aspx>
- Yoruldu, M. (2023). Türkiye’de Dijital Hizmet Vergisi Uygulaması ve Vergilemede Etkinlik Açısından Değerlendirilmesi. *Vergi Dünyası Dergisi*, 497, 31-45.
- Yüksel, H. (2012, Januray). Bulut Bilişim El Kitabı. Accessed on 10 April 2023 from <https://yuksehis.files.wordpress.com/2012/01/bulutbilic59fimekitabc4b1.pdf>
- Zodrow, G. R., and Mieszkowski, P. (1986). Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods. *Journal of Urban Economics*, 19(3), 356-370.