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Challenges of Digital Economy Regarding Tax Systems. Taxation of Digital Economy

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ABSTRACT

The occurrence of digital economy has fundamentally transformed the way businesses operate and interact with customers. Innovative technologies, e-commerce and the growth of online activities have generated new economic models that exceed traditional boundaries. On the other hand, this evolution has also brought significant challenges, particularly regarding taxation. As governments around the world struggle with how to effectively tax digital transactions and multinational online enterprises, they face a complex web of issues that need urgent attention and innovative solutions. The digital activity of companies around the world continues to grow, therefore, it is crucial to measure the impact of digital technologies and digital industries on the economy, in order to be able to govern, to be able to monitor investments, quantify success and develop appropriate policies and regulations. However, assessing the economic impact of digital technologies is more difficult than it seems.

1. Introduction

The digital economy is the part of the economy that is based on digital technologies. Also digital economy refers to all economic activities that use digital knowledge, information, communication, and technologies as key factors of production. It includes businesses, markets, jobs, and services that are enabled by the internet, mobile devices, platforms, cloud services, artificial intelligence or cryptocurrencies.
Online world of business has grown more quickly than the traditional tax rules, which has made things very difficult for governments and tax authorities.

In the context, the topic of the study is a double-edged sword. On the one hand, new business models, based on digital technologies, allow companies to obtain significant revenues and profits in different places around the world, without having a physical presence in that place. This leads to the erosion of the taxable base and substantial losses of public revenues. On the other hand, this fact creates inequity between regular and online businesses, which affects fair competition and the perception of tax fairness.

Additionally, the absence of a unified approach at international level, increases uncertainty and trade tensions. Some states already apply taxes on digital services, while others are waiting for OECD/G20 solutions. From the perspective of tax administrations, digitalization brings both challenges and opportunities, through the implementation of innovative solutions such as e-invoices, electronic reporting or the use of artificial intelligence. In the case of Romania and other emerging economies, the topic is all the more relevant, as adapting tax systems to new digital realities is essential for reducing collection gaps, consolidating public finances and aligning with European and international standards. The central objective of this paper is to analyze the main challenges that the digital economy poses for tax systems and to evaluate institutional and national responses to these challenges.

2. Digital business types and key tax implications

In relation with digital economy, the term digital business is commonly used in the business environment to describe firm models that rely on digital technologies. Digital technology has significantly changed how business is done, creating different online business methods that make tax rules and following them difficult. Because online systems are becoming more common, we need to understand how they are classified, since each type affects taxes differently, which means changing how money is made and how finances are reported. Digital business models can be widely classified in three categories: transaction-based, signature-based and platform-based models (Bock and Wiener, 2017).

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Digital businesses operate globally, but sometimes there is no physical connection to the jurisdictions in which they generate revenues (Ahmedov, 2020). This detachment complicates the collection of taxes, because the traditional tax systems are based on principles of territoriality-source and physical presence. Traditional tax systems assume that, revenues are generated in a certain location (geographically defined), assets and transaction have physical presence and taxation of individuals and companies is based on residence or physical business presence (based on legal seat or permanent establishment). Digital business models challenge this assumption, as companies can operate globally without a physical presence in the market where customers are located.

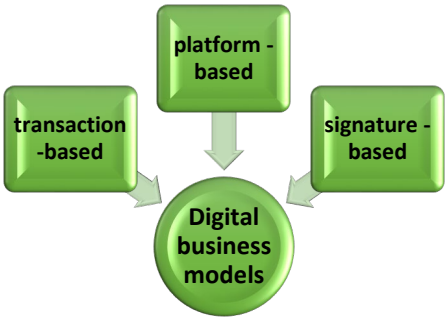

Figure 3. Digital business model types –basic typology
Source: own processing

Transaction-based digital businesses, such as e-commerce platforms, generate revenue through direct sales to individuals or companies across the world. However, tax treatment of these transactions differs substantially from one country to another, creating significant compliance challenges. By contrast, signature-based digital businesses, which rely on customer subscriptions, face challenges in determining the taxable base and complying with consumer protection laws. As Adebiyi (2023) notes, the distinction between goods and services has become increasingly blurred in digital contexts, rendering some existing tax provisions ambiguous and emphasizing the need for updated regulatory frameworks.

Further complexity arises in the case of digital platforms, which act as intermediaries connecting users from different countries, each governed by its own tax rules. Global sharing-economy and accommodation services exemplify this challenge, as they frequently operate across jurisdictions with heterogeneous VAT systems and reporting obligations. As digital ecosystems have evolved, the diversity and sophistication of digital business models have expanded considerably. Consequently, both academic literature and professional practice now endorse a more nuanced classifications that better capture the operational logic, monetization mechanisms, and technological underpinnings of contemporary digital enterprises.

Table 4. Tax issue related to digital business models

Digital business models	Examples	Tax issues
Digital Intermediation Platforms (Multi-Sided)	Marketplaces (Amazon, Alibaba), Ride-sharing & delivery (Uber, Bolt, DoorDash), Accommodation (Airbnb, Booking.com)	- nexus without physical presence, - VAT collection, - platform liability
Advertising-Based Digital Businesses	Search engines (Google), Social media (Meta/Facebook, TikTok, X/Twitter)	- value created by user participation/data, - allocation of profits
Subscription & Streaming Services	Media & content platforms (Netflix, Spotify), Software as a service models (Microsoft 365, Salesforce)	- classification of payments (royalties vs. business profits), - VAT on digital services
Freemium & App Economy	Mobile apps with in-app purchases (gaming, productivity apps), Hybrid ad + subscription models	- micro-transactions, - digital VAT compliance across jurisdictions
On-Demand / Sharing Economy	Gig platforms (Fiverr, Upwork), Peer-to-peer rentals/services	- traceability of income, - individual vs. business taxation, - withholding regimes.
E-Commerce (Direct Digital Sales)	Pure online retailers (Shein, Zalando), Hybrid (brick-and-mortar + online)	- VAT collection on cross-border B2C sales, customs duties, - permanent establishment rules.
Data-Driven & Cloud Businesses	Data analytics companies, Cloud storage & computing (AWS, Google Cloud, Azure)	- service vs. royalty distinction, place of value creation, digital PE debates

Digital business models	Examples	Tax issues
Emerging Tech-Based Models	Blockchain & Crypto (exchanges, DeFi platforms, NFTs), AI services (generative AI APIs, machine learning models sold as services)	- characterization of income, VAT/GST on crypto transactions, - transfer pricing of intangibles.

Source: own processing

According to reports from the OECD and the European Union, the most important categories of digital businesses include: digital intermediation platforms (e.g., Amazon, Uber, Airbnb), which create obstacles for effective VAT collection due to their multi-sided nature; advertising-based models (e.g., Google, Meta), where questions about international profit allocation arise; subscription and streaming services (e.g., Netflix, SaaS providers), which raise issues related to the classification and taxation of cross-border digital payments; and freemium or app-based models, characterized by micro-transactions and hybrid revenue streams. Other important categories include on-demand "gig" platforms, where revenue traceability and withholding mechanisms are central; e-commerce retailers, which must navigate complex VAT and customs regimes; cloud-based businesses that challenge traditional notions of permanent establishment and the taxation of royalties. Emerging models involving blockchain technologies, cryptocurrencies, and AI-based services introduce further uncertainties, particularly regarding income characterization and the allocation of taxing rights.

Together, these developments illustrate how digitalization continues to reshape traditional tax systems, demanding targeted and adaptive responses from tax authorities worldwide.

The tax implications of digital business models extend further to the field of compliance, emphasizing the importance of creating agile operational structures that can adjust to dynamic regulatory environments. The burden of digital taxes in various regions highlights the need for companies to be proactive in their understanding of tax obligations. Bock and Wiener (2017) stress that actually categorizing a digital business model establishes the foundations for solid tax compliance strategies, boosting the best financial performance and ensuring regulatory adherence.

3. Challenges of taxation in the digital economy – Literature review

The challenges of taxation in the digital economy have become important topic of research and policy discourse, particularly as traditional tax frameworks struggle to effectively address the complexities brought by digitalization. This literature review synthesizes recent studies that illustrate these challenges, including issues related to tax policy formulation, compliance, and the evolution of tax regulations at both national and international levels.

A significant challenge facing the digital economy is tax evasion, which primarily occurs through methods used by multinational corporations to shift profits across different jurisdictions. According to Olbert and Spengel (2017) traditional tax systems are not designed to address the complexities introduced by digital transactions. The OECD action plan called Base Erosion and Profit Shifting (BEPS) is a significant measure in this regard; however, the degree of its application differs widely across different nations, leading to ongoing difficulties (Jiménez, 2018). Also, it is fundamental for jurisdictions to enhance compliance mechanisms in order to address the increasingly complex issue of tax evasion that has emerged in the digital landscape (Boccia and Leonardi; 2016).

Jurisdictional issues also complicate the taxation of digital economies. The global nature of digital services usually results in confusing tax obligations, as resources are consumed in one country while profits are generated in a different place.

One big problem in taxing the digital economy is the inadequacy of existing tax frameworks to accommodate the characteristics of digital transactions. Traditional taxation systems rely on geographical presence and physical infrastructure, but these systems are inadequate in addressing the nuances of digital businesses that operate across national borders without a tangible presence (Mpofu, 2022; Ntiamoah & Asare, 2020). Ntiamoah and Asare emphasize that the lack of public understanding and knowledge about digital taxation in developing economies exacerbates this issue, leading to resistance against necessary tax reforms (Ntiamoah & Asare, 2020). This sentiment is echoed by Igbinenikaro and Adewusi, who identify the need for global digital tax reforms that can adequately reflect the realities of digital revenues (Igbinenikaro & Adewusi, 2024).

Therefore, the primary challenge in taxing the digital economy is to establish a clear connection that justifies a jurisdiction's right to tax the profits. (Haslehner, Kofler, Pantazatou, & Rust, 2019). In traditional models, a business would be taxed in the location where it has a physical presence, such as a store, office, fabric. However, digital businesses can generate significant revenue in countries without a physical presence, leading to loopholes and issues of double taxation or tax avoidance (Igbinenikaro & Adewusi, 2024). This raises questions about what is an adequate connection in the digital economy and how authorities can effectively claim their fair share of tax revenue. (Abdul Rashid, Sanusi, & Abu Hassan, 2024).

The nature of digital goods and services further complicates taxation (Walker, 2022). Unlike physical products, digital goods can be easily replicated and distributed. (Atasoy & Morewedge, 2018). Consequently, determining their value for taxation purposes poses difficulties. The valuation also extends to the monetization of user data and algorithms, which are critical assets for many digital companies (Shestak, Kiseleva, & Kolesnikov, 2021). Tax authorities must navigate these complexities to establish fair tax policies that accurately reflect the value generated by such intangible assets (Danescu, 2020).

Digital platforms often serve as intermediaries, connecting buyers and sellers (Gorbachuk et al., 2022). This introduces issues such as these platforms should be responsible for tax collection on behalf of their users? Navigating this responsibility varies by jurisdiction, and the lack of uniformity can lead to inconsistencies in enforcement and compliance (Bertolini, Episcopo, & Cherciu, 2021).

Governments must decide whether to hold platforms accountable for the tax obligations of individual businesses utilizing their services or to maintain a system that places the onus solely on the sellers. (Nooren, Van Gorp, van Eijk, & Fathaigh, 2018).

It is not yet a fully generalized practice worldwide, but the trend is clear: more and more jurisdictions are transferring the responsibility to report and collect taxes to digital platforms.

For example, in the European Union – through the VAT e-commerce package and the DAC7 directive (reporting of revenues obtained by sellers on platforms), platforms must collect VAT for certain cross-border transactions.

In United States – there is no unified federal system, but most states require platforms (Airbnb, Uber, Amazon) to collect sales tax or report supplier revenues. Many countries such as Australia, New Zealand, Singapore or India have introduced obligations for platforms to collect general sales tax or value added tax on digital services.

Because digital economy is worldwide, countries around the world have to collaborate and synchronize their taxation regulations (Sose, Tascon, & Viemose, 2023). Different countries have different rules for taxing digital services, which can generate conflicts and disagreements among them. Additionally, businesses operating in multiple countries may face complex obligations that vary significantly from one jurisdiction to another.

Cooperative efforts, such as those initiated by the OECD, aim to establish a framework of international tax regulations that address the challenges of the digital landscape (Nembe & Idemudia, 2024). Although various proposals have emerged to tackle these issues, the future remains uncertain. When nations prioritize their own interests while attempting to cooperate with others, it complicates the creation of a cohesive global tax framework for the digital economy. Furthermore, the tendency to blame each other for tax avoidance issues exacerbates the situation, as noted by Hodžić (2022), often resulting in unilateral measures that may increase protectionism.

Getting a worldwide agreement on taxing digital activities is a key element for stopping things from falling apart and causing disagreements. Collaboration between countries can help bring tax systems in line, make it easier for companies to follow the rules, and make sure tax money is shared fairly.

The integration of new technologies in the tax administration plays a critical role in addressing all these challenges. Monitoring the transaction has the potential to improve compliance and optimize tax collection processes. Mohammed et al. (2023) highlight that the growing adoption of digital tools can improve the efficiency of the tax administration, facilitating tax authorities to monitor and regulate transactions. However, the potential of digital technologies, such as Artificial Intelligence (AI), to transform tax compliance, is still sub explained as Ezeife et al. (2021) ask for a conceptual structure for AI oriented tax transformation.

Transition economies face distinctive problems that make it difficult to adjust tax systems to the digital economy. According to Martinez-Vazquez & McNAB (2019), these nations often lack the necessary infrastructure and administrative skills to successfully apply modern digital tax laws. Studies suggests that the distinct features of these economies need personalized strategies that take into account their particular socio-economic circumstances (Saragih et al., 2023).

Table 5. Thematic axis, key ideas and main authors

Thematic axis	main authors	key ideas.
Nexus and significant economic presence	Haslehner et al. (2019); Abdul Rashid et al. (2024)	There is a need to redefine the taxation criteria through the concept of "significant economic presence".
Profit shifting and BEPS,	Olbert & Spengel (2017); Jiménez (2018); Boccia & Leonardi (2016),	Digital multinationals use profit shifting; BEPS attempts to limit this phenomenon.
Taxation of goods, services and intangible assets,	Walker (2022); Danescu (2020); Shestak et al. (2021); Adebiyi (2023)	The valorization of data, algorithms and digital services raises major tax classification issues
The role of digital platforms	Gorbachuk et al. (2022); Bertolini et al. (2021); Nooren et al. (2018)	Platforms become responsible for collecting/reporting VAT and taxes,

Thematic axis	main authors	key ideas.
International cooperation and geopolitical tensions,	Hodžić (2022); Nembe & Idemudia (2024)	The lack of a unified approach at the global level generates trade tensions and the risk of protectionism.
Integrating technologies into tax administration,	Mohammed et al. (2023); Ezeife et al. (2021); Martinez-Vazquez & McNAB (2019),	Digitalization of tax administration (e-invoice, AI, big data) increases efficiency, but requires adequate infrastructure
Ethical dimensions and sustainability,	Belahouaoui & Attak (2024); Vence, X., & López Pérez (2021); Dølvik, J. E., & Jesnes, K. (2018)	Data protection and tax ethics are essential; taxation can support the circular economy and sustainability

Source: own processing

The challenges brought by digital economy and taxation extends beyond compliance problems, also presenting ethical and operational challenges. For example, digital trade raises concerns about privacy and data protection, which are fundamental to ensure taxpayer confidence (Belahouaoui & Attak, 2024). The need for adaptive policies that can accommodate the rapid pace of technological advances cannot be exaggerated. According to Lucas-Mas and Junquera-Varela (2021), a digital data tax and a global internet tax agency can be essential components of a redefined tax scenario.

The role of tax policy in the formation of sustainable economic practices is another critical area of discussion. Vence and López Pérez (2021) point out that taxation can encourage behaviour aligned with environmental goals in the digital economy. By introducing reforms that focus on sustainability, policy formulators can leverage taxation as a tool not only for revenue generation, but also to promote more circular economy.

In addition, the adaptation of tax systems should also consider global economic dynamics. As digital economies give rise to new business models, such as the economy of the show, traditional work taxation structures may need significant reforms (Dølvik & Jesnes, 2018). This rethink of tax policies should integrate work considerations and economic participation changes caused by the rise of digital platforms and services.

4. Bibliometric Analysis of Research on Taxation in the Digital Economy

To complement the narrative literature review above, a more detailed bibliometric study was conducted. The purpose was to identify the main ideas, research patterns and trends in academic papers related to the taxation of the digital economy. This approach provides a systematic and numerical analysis of academic papers, which is useful for a better understanding of complex and changing fields such as digital taxes. The information needed for this study was downloaded from Web of Science collection, using key-words such as “taxation”, “digital economy”, “challenges” and “digital business”. The information processing was carried out using the VOS-Viewer software. By tracking how often all the key words appear together, the results show a clear way of organizing the papers, demonstrating the broad spectrum of taxation in a digital world. The search produced 240 scientific articles, published between 2010 and 2024. This approach generated a comprehensive keyword network composed of over 100 unique terms, which were grouped - through the VOSviewer algorithm - into four major clusters. Each cluster reflects a distinct conceptual dimension of how taxation interacts with digital business models and the broader digital transformation of the economy. The four clusters represent the economic-legal core of taxation of the digital economy at the international level, the technological forces shaping digital tax administration, the market and transactional dynamics of digital platforms, and an emerging interdisciplinary perspective linking digitalization to public governance and well-being.

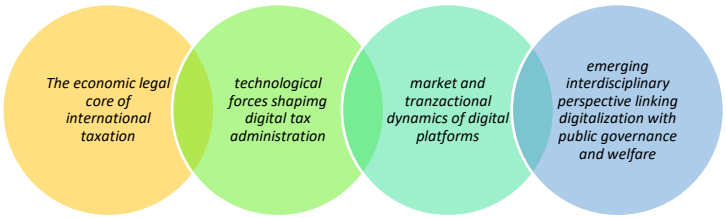

Figure 4. Conceptual clusters

Source: own processing

The first cluster 1 – *Digital Economy, Tax Policy and International Taxation (Economic–Legal Core)* deal with conceptual framework of the field. Papers of this cluster examines how digitalization challenges traditional principles of international taxation, in particular with relation to the erosion of physical presence, reallocation of taxing rights under OECD/BEPS, profit shifting, base erosion, and aggressive tax planning by multinational digital firms, tensions between tax fairness, competition, and value creation. The dominance of

keywords associated with OECD, BEPS, and international tax law reflects the supremacy of global tax reform debates in the academic discourse on digital business taxation.

The second cluster - *Technology, Digital Transformation and Data-Driven Taxation (Tech-Driven Governance)* captures the rapid technological changes that reshape tax systems. In this cluster, the focus moves from tax rules to technological capabilities, like artificial intelligence, digital transformation, privacy, data protection. In fact, this cluster represents the technological infrastructure of digital taxation and demonstrates that digital business models cannot be understood in isolation from the technologies enabling them.

The third cluster – *Market Structure, Digital Platforms and Consumption-Based Taxation* focuses on the economic and transactional dimension of digital business, particularly the taxation of platform-based and cross-border digital transactions. Research in this cluster explores tax obligations of online platforms and marketplace operators, challenges in applying VAT, sales tax, and consumption taxes in digital markets, competitive dynamics and market concentration among platform-based firms. Transformation of market structure—driven by appearance of platforms - creates new complexities for consumption-based taxation and competition policy.

The fourth cluster – *Social, Public Sector and Welfare-Related Dimensions of Digitalization (Emerging Interdisciplinary Cluster)* highlights an emerging interdisciplinary direction in digital taxation research. It brings together subject like digitalization of public services, governance challenges (including corruption, inequality, and state capacity), sustainability and the socio-economic impact of digital transformation. This cluster highlights that digital taxation research is slowly expanding beyond economics and law into public administration, welfare policy, and socio-economic development.

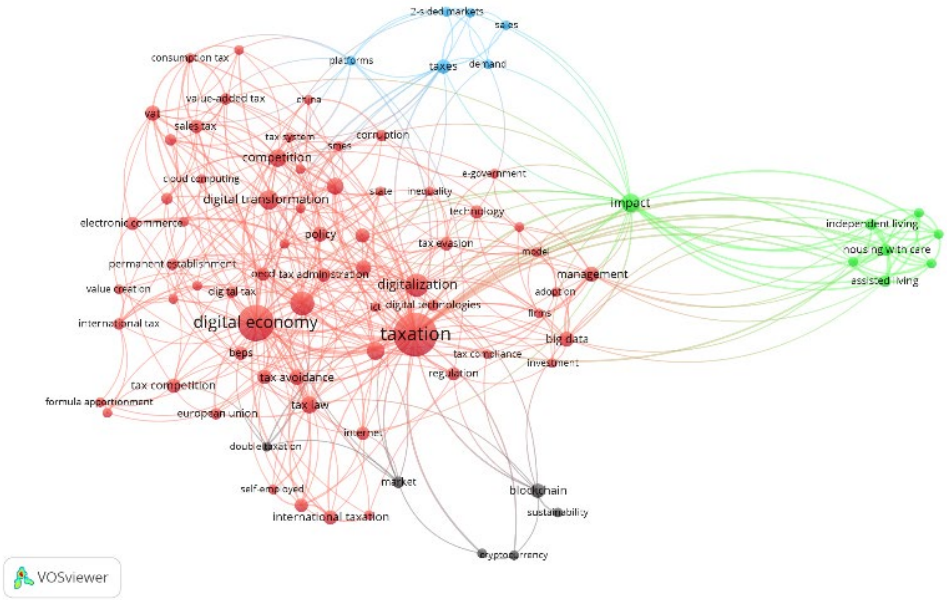

Figure 5. Visual mapping of taxation of digital economy

Source: own processing

The four clusters resulting from the keyword co-occurrence analysis reveal that digital business taxation is multidisciplinary, integrating economic concepts, fiscal law, technology, governance, and competition policy. We observed a rapid evolution of the subject, with most influential keywords linked to reforms and emerging technologies, driven by technological innovation, particularly AI, blockchain, and digital platforms. Divided between direct tax (corporate income tax) and indirect tax (consumption tax) challenges are increasingly connected to global institutional reforms, especially OECD/BEPS initiatives.

This mapping confirms that the intersection between digital business and taxation forms a complex research landscape requiring integrated economic, legal, and technological perspectives.

5. Research Methodology

This research employs also a qualitative design, focusing on document analysis as the primary method of research, aiming to understand how different stakeholders conceptualize and frame the challenges of taxing the digital economy. The analysis relies on secondary sources such as policy papers, consultation documents, legal frameworks, and academic studies. This methodological choice enables an in-depth exploration of institutional discourses and policy debates across different jurisdictions. A thematic content analysis was applied to identify recurring challenges, with coding categories developed both deductively, based on prior literature, and inductively, through close reading of the selected documents.

The choice of a qualitative, document-based method is based on the idea that we need to examine not only the legal and fiscal mechanisms proposed for the digital economy, but also the underlying discourses and rationales that shape them. Quantitative indicators alone cannot capture the multidimensional nature of tax digitalization; hence, a qualitative perspective provides the flexibility to contextualize reforms, compare jurisdictions, and identify patterns of convergence or divergence in policy responses.

Data Collection

Data were collected from publicly available academic, institutional, and policy sources. The core dataset included reports and consultation documents from the OECD/G20 Inclusive Framework, European Union communications on digital services taxation, and working papers from national tax authorities in countries that have either implemented or debated digital services taxes. Additionally, academic journal articles from databases such as JSTOR, Science-Direct, and Springer-Link were reviewed to provide a scholarly perspective on the issues. Policy briefs from international organizations, such as the International Monetary Fund (IMF) and the World Bank, were also consulted to extend the global perspective.

Results and discution

The thematic analysis of institutional and academic sources revealed four major areas of convergence in the debate on taxing the digital economy: (1) changing how taxes are set-up, (2) national initiatives such as Digital Services Taxes (DST), (3) the integration of technology in tax administration, and (4) national implementation trends, with Romania serving as a representative example of an emerging economy aligning with OECD and EU frameworks.

(1) Changing How Taxes are Set Up - we need to rethink how taxes are imposed. Traditional tax systems depend on physical location of a company and are not suitable anymore for today. Online companies can make a lot of money in a place just by doing performing online business activities, even if they aren't actually there with a physical location.

In response, international organizations and scholars propose to replace the physical nexus criterion with the concept of *"significant economic presence"*, allowing countries to tax companies that engage extensively with their markets through digital means (Haslehner et al., 2019; Abdul Rashid et al., 2024).

Governments around the world should consider updating their tax rules to match the way the digital world works. This could mean using the rule of "significant economic presence" concept of OECD. This allows taxation of companies based on how much business they do in a jurisdiction, not just where they are located.

In 2021, the OECD and G20 countries introduced the Two-Pillar Solution aimed to reform global tax rules: Pillar One proposes reallocating the right to tax multinational companies' profits based on where their consumers are located, rather than where the companies have a physical presence; Pillar Two introduces a global minimum corporate tax rate of 15%, aimed to prevent companies from shifting their profits to low-tax jurisdictions.

According to Haslehner et al. (2019), it is important to update traditional tax concepts in order to reflect the realities brought by the digital economy. This requires a strategy for establishing what signify a taxable presence within a certain jurisdiction. According to Adebiyi (2023) taxing digital infrastructures poses distinct challenges that need innovative approaches, especially given the swift advancements in technology.

The OECD Two-Pillar solution aims to modernize international taxation, but it is politically sensitive, legally complex, and administratively demanding (Kurian, 2022). The biggest risks are uneven implementation, high compliance burdens, and disputes over who really benefits (developed vs. developing countries).

While Pillar One focuses on the reallocation of taxing rights, Pillar Two introduces a global minimum corporate tax rate, aiming to ensure that the profits of large multinational enterprises (MNEs) are subject to a minimum level of taxation regardless of where they operate.

Pillar one is in the final negotiations and adjustments stage, but is not yet effectively implemented. As countries around the world face with the complexities of the digital economy, the adoption of Pillar Two has become a key priority for policymakers globally. In fact, pillar two has moved from theoretical agreement to practical implementation and effective implementation, becoming an emerging global tax standard. However, its implementation is uneven, and years will be decisive in seeing whether the main objective — reducing tax competition and ensuring a fair minimum tax — is achieved on a global scale.

Even with these difficult parts, there is still a lot of worldwide interest in putting Pillar Two into action. As nations keep working to solve the tax problems that come from the online world, the OECD's Pillar Two plan is set to be very important in changing how taxes work between countries in the future.

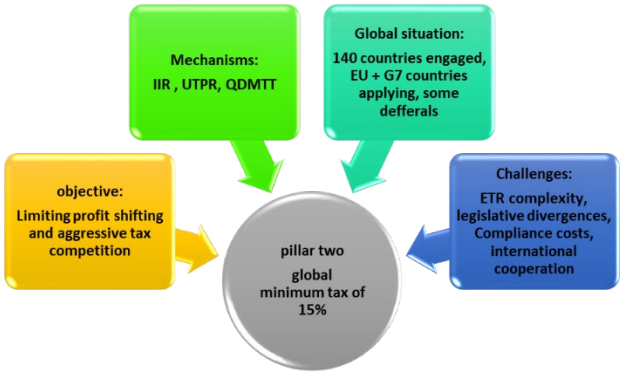

Figure 6. Pillar two synthesis

Source: own processing

Pillar Two contains three main rules that establish the global minimum tax: The first is a qualified domestic minimum top-up tax (QDMTT), which countries could use to claim the first right to tax profits currently being taxed below the minimum effective rate of 15 percent. The second is an income inclusion rule (IIR), which determines when the foreign income of a company should be included in the taxable income of the parent company. When a company's effective tax rate falls below 15% , additional taxes would be owed in its home jurisdiction. The third rule in Pillar Two is the undertaxed profits rule (UTPR), which would allow a country to increase taxes on a company if another related entity in a different jurisdiction was being taxed below the 15 percent effective rate. If multiple countries apply a similar top-up tax, the taxable profit would be divided based on the location of tangible assets and employees.

(2) Introducing Taxes on Digital Services - In parallel with OECD solution, some countries have begun to use taxes on digital services that target things like online ads and social media sites. While this plan offers a quick answer, some worry it could cause problems with trade and hurt new ideas in the digital world (Haslehner, Kofler, Pantazatou, & Rust, 2019). It's important to find a middle ground that protects fair taxes while also helping things grow.

Digital Services Tax (STD) aims to allocate tax rights more equitably (Harpaz, 2021). However, critics argue that STDs may provoke commercial disputes and may not sufficiently face underlying challenges represented by digital transformation of business models (Cockfield, Hellerstein and Lamensch, 2019). This debate is particularly pertinent in the European Union, where policy formulators have struggled to create an inclusive structure that balances efficiency and justice (Hodžić, 2022).

(3). Promoting Working Together Globally: The global nature of the digital economy highlights the necessity for international cooperation and coordination in tax policy (Sose, Tascon, & Viemose, 2023). Many countries have different rules on digital service taxes, which can result in disputes between nations. Also, businesses operating across borders may face complex compliance requirements that vary significantly from one jurisdiction to another. Collaborative efforts, such as those initiated by the OECD, aim to create a framework for international tax rules that accommodate the challenges posed by a digitalized economy (Nembe & Idemudia, 2024)

Getting a worldwide agreement on taxing digital activities is key to stopping things from falling apart and causing disagreements. Taking part in talks with other countries can help bring tax systems in line, make it easier for companies to follow the rules, and make sure tax money is shared fairly.

(4). Integrating new technologies in tax administration: The integration of new technologies in the tax administration plays a critical role in addressing all these challenges. Monitoring the transaction has the potential to improve compliance and optimize tax collection processes. Mohammed et al. (2023) highlight that the growing adoption of digital tools can improve the efficiency of the tax administration, facilitating tax authorities to monitor and regulate transactions. However, the potential of digital technologies, such as Artificial Intelligence (AI), to transform tax compliance, is still sub explained because Ezeife et al. (2021) enquire for a conceptual structure for AI oriented tax transformation.

The digitalization of tax administrations has broader implications in terms of ethics and sustainability. In terms of ethics, the use of artificial intelligence and data-driven systems in tax monitoring introduces risks related to data privacy, algorithmic bias, and unequal access to technology.

In terms of sustainability, the implementation of digital technologies in tax systems supports the broader goal of maintaining government finances in good condition over time. Digital tax systems that function efficiently and equitably improve the ability of governments to generate revenue for supporting citizens, fostering innovation, and achieving environmental objectives (Vence & López Pérez, 2021). Thus, transitioning to digital taxation contributes to the United Nations Sustainable Development Goals (SDGs), particularly Decent Work, Economic Growth, Peace, Justice, and Strong Institutions.

Even so, countries that are still growing have problems that keep happening: not enough infrastructure, databases that are broken up, and not enough people knowing how to use digital tools

(Martinez-Vazquez & McNAB, 2019; Saragih et al., 2023). To make sure things are done both morally and in a way that lasts, upgrading technology must go together with making institutions stronger, having everyone involved in how things are run, and having strong legal ways to protect data.

So, the results show that making tax administration digital is not just about upgrading technology, but about changing things in a moral and lasting way. A good digital tax setup must find the right balance between new ideas and fairness, doing things well and being open, and using computers and having people in charge. Although several proposals have emerged to face these challenges, the following way remains full of uncertainty. The interaction between national interests and international cooperation complicates the development of a cohesive global tax structure for the digital economy. Pointing of fingers between jurisdictions on tax prevention practices exacerbates the situation, as observed by Hodžić (2022), usually resulting in unilateral measures that may lead to increased protectionism.

6. Digital Economy and Its Impact on Romanian Taxation. Romania's Solutions to Digital Taxation

Digital transformation in Romania has been rapid and extensive, with the launch of Digital Agenda for Europe 2020 program in 2010 acting as a key driver of this change. The programme aimed to make best use of the benefits of the digital single market and increase Europe's economic growth and social progress through digital technologies. Nevertheless, as the digital sector expands, it brings new challenges in the area of taxation. As discussed, a key challenge in taxing digital companies is to determine where the economic activity takes place. Traditional tax rules are based on the location of companies. However, companies such as Netflix, Amazon, Facebook and Google generate significant revenues from markets like Romania without having headquarters, local offices or physical infrastructure. This creates a gap between the profits these companies make and the taxes they are required to pay. Because they do not meet the criteria for a "permanent establishment", they are often taxed minimally or not at all, despite generating significant revenues from the countries where their customers are located. Another challenge is to identify and track where digital transactions take place, as these transactions often take place across borders. The nature of online businesses allows them to operate globally without clear geographical boundaries, making it difficult for tax authorities to identify the exact jurisdiction in which to levy taxes.

In Romania, the taxation of the digital economy has been influenced significantly by OECD and European Union rules. Even though Romania is not yet part of the OECD, has an active participation on the group working on BEPS and has pledged to use the OECD/G20 Two-Pillar Solution. One aspect of this alignment can be seen in the case of value added tax (VAT). Romania uses the rule that taxes online services based on where they are purchased, which is in line with OECD and EU law. Online services for individuals are taxed where they are used, and the One Stop Shop (OSS) system makes it easier for sellers from other countries to comply with Romania's VAT rules. This plan ensures that both Romanian and foreign online businesses are treated equally, demonstrating that Romania agrees with the OECD on the fair taxation of digital businesses across countries.

The second aspect of this alignment is about taxing companies and dividing up profits. Romania has avoided creating its own Digital Services Tax, choosing to wait for a global fix under OECD Pillar One. This will move some of the profits of big international digital companies to the countries where their users and markets are. By not acting alone, Romania shows it wants to work with other countries to prevent taxes being charged twice and avoid trade issues.

In parallel, Romania is arranging to implement Pillar Two, which establishes a global minimum corporate tax of 15% for large multinational groups. Through the transposition of the EU Minimum Tax Directive, Romania ensures that highly digitalized corporations with activities in its territory contribute a fair share of tax, even if they exploit incentives or shift profits abroad. This reform is particularly important in the Romanian context, where ensuring a stable tax base is essential for sustainable public finance.

Besides following OECD rules for VAT and company taxes, Romania has made big steps in making tax administration digital, which is in line with what the OECD suggests. The introduction of the RO e-Factura system for required e-invoicing, the SAF-T electronic reporting system, and the pre-filled VAT returns (RO e-TVA) give tax authorities data in real-time or close to it.

These tools not only improve following the rules in the country but also help Romania keep an eye on digital transactions, which have been hard to control in the past.

In general, Romania's path in taxing the digital economy shows it is committed to two things: first, using OECD standards and solutions as part of joining the organization, and second, modernizing its tax system to match the digital changes. While there are still problems, like reducing the VAT gap and stopping aggressive tax planning by international companies, the direction of change clearly shows that Romania wants to include OECD rules in its tax system and be a reliable partner in the changing world of digital taxes.

7. Conclusion

In conclusion, taxation in the context of digital economy reveals a complex network of challenges that call for urgent reconsideration of taxation principles from policy makers to academic researchers. Issues, such as tax prevention strategies, jurisdictional uncertainties and tax efficiency of existing structures, emphasizes

the urgent need for a paradigm change in taxation. Continuous digitalization in the tax administration offers potential paths to improve compliance, but also raises ethical and operational issues that must be addressed. Thus, the evolution of tax systems to meet the demands of the digital economy requires collaborative efforts at national and international levels, as well as innovative approaches in tax theory and application of taxation. The transition to a more equitable and efficient tax regime in the digital age is just beginning, but its importance cannot be overstated.

The digital economy presents unique challenges for traditional tax systems, requiring innovative and collaborative approaches in the field of taxation. As businesses continue to evolve in an increasingly digital world, governments need to adapt their tax policies to ensure that they collect revenues efficiently, while encouraging economic growth and innovation. By adopting new frameworks and international cooperation, it is possible to create a fair, equitable and sustainable tax environment in the context of continued technological advances. The future of taxation in the digital economy depends on our ability to navigate these complexities and develop solutions that benefit both governments and businesses.

The existing literature highlights significant tensions in adapting tax systems to the realities of a digitalized economy. While scholars and institutions have identified critical issues such as nexus rules, profit shifting, and the balance between unilateral and multilateral solutions, consensus remains fragmented, and empirical evidence is still emerging. These gaps underline the need for further exploration of how tax systems are currently responding to digitalization, and what challenges remain unresolved. To address this gap, the present study adopts a qualitative, exploratory approach that synthesizes insights from academic, institutional, legislative, and professional sources, and compares international initiatives with national responses. The following section outlines the research methodology employed to achieve this aim.

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