



Taxation Challenges in the Age of Global Digital Trade

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Abstract

The volume of global digital trade has been increasing rapidly and is transforming the economic landscape of the world, creating new areas of business and consumer activity, and challenging traditional tax structures. Physical presence as a basis for taxation has become more and more redundant in today's world of digital platforms, e-commerce businesses, cloud services and cross-border digital transactions. Today, in an era of digital platforms, e-commerce, cloud services and trans-border digital transactions, the concept of physical presence as a tax base definition is becoming more and more irrelevant. This has led to challenges for governments around the world in the identification of taxable income, in establishing tax jurisdiction and in ensuring a fair tax take from multinational digital companies. The present study looks at the key tax issues arising out of the expansion of the digital economy and assesses the workings of the current tax rules in tackling these concerns. The research approach adopted is descriptive and analytical and the data employed is from academic research, policy report and international taxation framework. A specific interest lies on 'profit shifting', 'base erosion', 'tax avoidance', 'digital permanent establishment' as well as the difficulty of the taxability of intangible assets and digital services. This research also examines the activities of the international organisations and national governments in the process of modernizing tax systems and creating tax frameworks to enable the taxation of digital businesses in an equitable manner. The results show that traditional tax principles are less and less suitable to recapture value created from digital activities, and that this results in a loss of revenue and a difference between digital and traditional businesses.

Moreover, the different tax policies across countries make it difficult to coordinate and comply with international tax regime. The study emphasizes the need for international cooperation, consistency in tax principles and tax administration through technological solutions to tackle these issues.

The paper calls for ongoing policy innovation, global cooperation and flexible and dynamic regulation to achieve sustainable and equitable taxation in the digital age, which needs to keep pace with the changing business models. It is crucial to achieve fiscal sustainability, fair competition, and long-term economic development in a digitalized global economy.

Keywords: Digital trade, digital taxation, e-commerce, tax policy, multinational enterprises, profit shifting, digital economy, international taxation.

1. Introduction

Digital technologies have driven global trade to change in new ways, opening new opportunities for businesses, consumers and governments. Digital trade includes all trade activities that take place electronically, such as e-commerce, digital services, the cloud, online advertising, streaming platforms, cross-border data transactions, etc. As digitalisation continues to transform the global economy, outdated tax systems are having growing challenges of recognising, measuring and taxing economic activities that span across countries and don't necessarily require a physical presence in a specific jurisdiction. Traditionally, the basis of tax on income was established on physical location, on the basis of which the corporations generated income in a country by means of tangible assets, permanent establishments and identifiable operations in this country. Today, however, multinationals with a digital business can offer services, earn high revenues, and engage with consumers across various countries without building up a significant physical footprint. This development has raised doubts about the success of traditional tax theory and introduced a host of issues related to the allocation of revenue, tax equity, and avoiding profit shifting. As digital

platforms and technology-based business models have grown, governments have increasingly been asked to tax digital economic activity, which has sparked a debate on the subject. The governments have been discussing taxing on digital economic activity, with the discussion especially hot in the rising markets and in the context of technology-driven business models. The international tax system does not currently account for the value added caused by the use of digital context, user contributions, data creation and interactions. Several countries have observed the need to consider the value added caused by the use of digital context due to user contributions, data creation and interactions. Response by Governments range from Digital Services tax, Equalisation levy and Corporate tax regime changes to ensure that digital businesses pay their fair share of tax. On the other hand, the disparities in the tax policies of the various nations have raised the risk of double tax and tax conflicts and have complicated international trade. International cooperation and policy changes have launched into action to tackle these issues in a global manner. The OECD and the G20 have been meeting on how to put in place a fair and agreed set of rules for taxing the electronic economy. The focus of the programmes is on the modernisation of the international tax framework, a redefinition of the concept of nexus, a reallocation of taxing rights and solutions on how to tackle BEPS. The process of realizing the changes is complicated, however, due to differing national and other interests, technological developments and evolving nature of digital business models. Legal and administrative issues are also among the problems related to digital taxation; economic and policy questions are also covered. The importance of raising adequate revenues is a key consideration by governments and the target for innovation, investment and economic growth. There is a danger of excessive tax burden having a negative impact on technological development and cross-border digital trade, and the lack of it could risk fiscal sustainability and cause competitive distortions between online and offline transactions and businesses. So, one of the key challenges for policy makers today is to adapt tax policies to the evolving technological environment to be efficient, equitable, transparent and flexible. In this context, the current research analyzes the tax issues in today's digital era. It discusses the constraints of the current tax system, the new challenges introduced by digital business models and the policy measures that have been taken by the governments and international bodies. The study also takes into account the implications for the business, tax administrations and the international economic governance of digital taxation, and the need for a coordinated, balanced approach to digital taxation.

2. Background of the study

Digital technologies have developed rapidly to shift the nature of world trade, as well as creating new opportunities for businesses, consumers and governments. The technology-driven business models such as digital platforms, e-commerce marketplaces, cloud computing, online advertising, streaming services and others have allowed companies to conduct business internationally without having a large physical presence in another country. This shift has substantially changed the traditional economy and has thrown into doubt traditional principles of international taxation. Traditionally, taxation has been based on the physical presence theory: profits made in a jurisdiction are taxable there if the business has an office, factory or other tangible establishment located in the jurisdiction. However, these traditional methods are not as applicable in the digital economy. Multinational digital enterprises may be able to reap significant revenues from users and customers in several jurisdictions, but have relatively light physical presence in any of them. This creates difficulties for governments in establishing what value added is, and what taxing rights accrue to which country. With the digitalization of trade, tax avoidance, profit shifting and base erosion are a growing concern. Others, such as multinational firms, have complex organisational and IP structures which allow shifting of profits to low-tax jurisdictions, reducing companies' tax burden. The practices have led to various concerns among the policy-makers, tax authorities and international institutions about the equity and effectiveness of the existing tax system. This is particularly the case in less developed economies with high corporate income tax rates, and whose tax regulatory capabilities are less than optimal to tax economic activity of digital businesses in their markets. In response, some countries have adopted unilateral steps and made laws imposing taxes on digital businesses, which are designed to tax digital business that conducts business in the country where they are set up. They have not only helped fill the tax gap, but they have also made for double taxation, trade conflicts and more expensive compliance costs to multinationals. Simultaneously, international organisations have been asking for collaborative fixes in the area of modernisations in international tax practices. The measures taken – such as those relating to profit allocation and minimum taxation for multinationals and taxation of digital economy – reflect ongoing efforts to create a more equitable and sustainable international tax system. The importance of cross border electronic transactions is rising and there are concerns regarding value added tax (VAT) and Goods services tax (GST), data driven business models, cryptocurrency and digital asset taxation. Tax authorities must be vigilant about new technologies and creative to collect taxes and help ensure compliance and cooperation in an international trade that is moving towards a digital world. Digital businesses are becoming increasingly complex and traditional tax concepts need to be evaluated in order to keep the tax system efficient, transparent and as a means to economic development. Issues of taxation in the Digital Trade in global era have become a research and policy issue. The difficulties posed by the current tax systems as well as the impact digitalisation will have on tax policy and the impact of new tax policy measures have to be tackled if tax systems are to achieve a balance between economic growth,

international competitiveness and fiscal sustainability. The aim of this work is to contribute to this discussion and analyse the key tax issues that arise in the context of digital trade – and the way in which these issues can be addressed in the present globalised context.

3. Justification

Technological developments and digitalization, and the increasing share of digital trade have revolutionized international business. It allows businesses to generate substantial revenue through digital platforms and other online channels like e-commerce platforms, cloud computing, online ad campaigns, and digital content distribution, even in regions where they may have minimal or no brick-and-mortar locations. It has brought new challenges to the traditional tax structures, which are generally organized around a specific geographic location and type of activity. The governments of various countries are trying to determine the source of value in digital trade and the jurisdiction of taxation. The creation of value and where taxes can be imposed in digital trade is becoming more complex, especially as it expands every day. The absence of any clear international standards for taxing digital transactions has created issues such as loss of revenue for national governments, double taxation, tax avoidance and profit shifting. The developing world is especially impacted, since it is attempting to capture a fair share of tax collections from multinational corporations that are doing business in their markets. The study is rich of significance in the context of the mounting needs for a deeper understanding of the prevailing challenges in regulating digital economic activities via taxes. It seeks to explore the policy, tax and business challenges in a rapidly digitalizing world. In addition, the taxing of the digital economy has sparked a constant and ongoing international discussion about the issues of fairness, economic efficiency and international cooperation. Also significant is this research, which has come to be a major component of the economic growth, innovation and international trade. Such detailed tax analysis for this industry can help shape more effective tax policies that could yield more tax revenues and spur digital innovation and international expansion of business. The results of the study can help governments, international organizations, tax professionals and academics in the development of tax systems that are fair and sustainable in the context of the digital economy. The study of taxation issues in the time of global digital trade is timely and relevant as it addresses the important issues at the intersection of technology, international business and public finance.

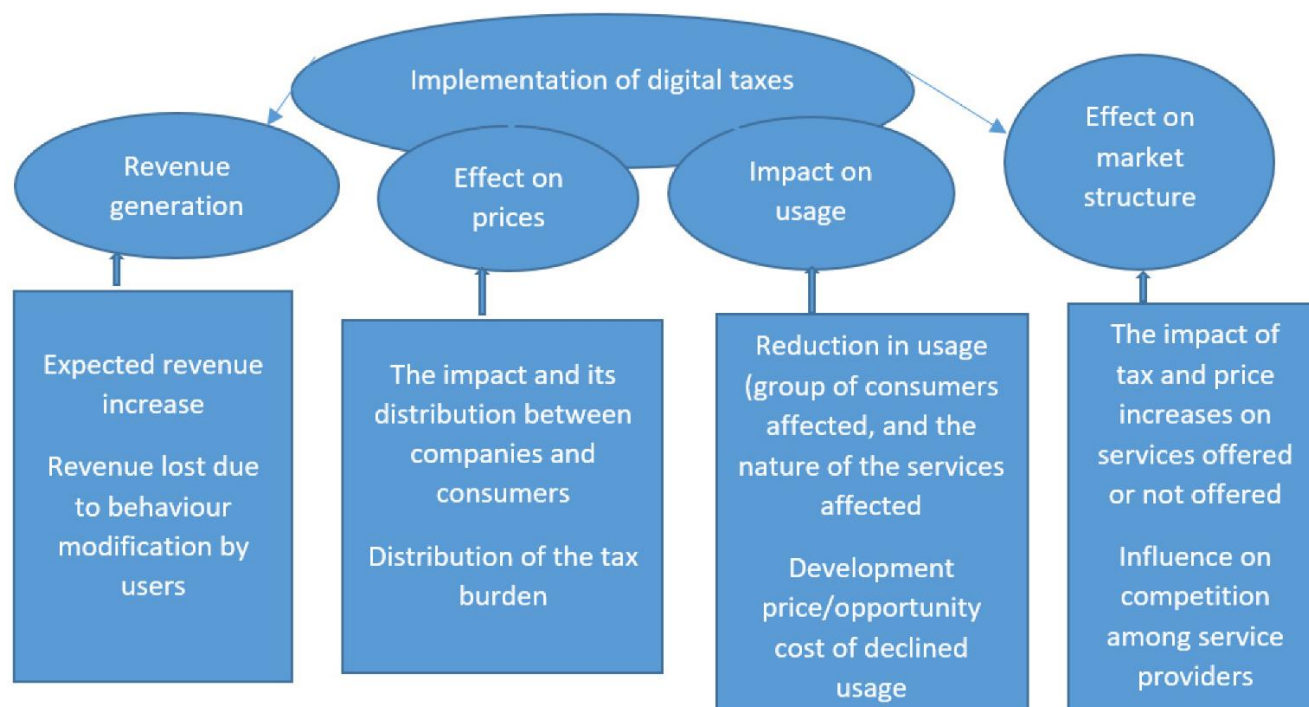
4. Objectives of the Study

1. To analyse the changing characteristics of international digital trade, and its implications for national tax systems.
2. Discuss the issues and risks associated with cross-border digital transactions and digital business models at tax level.
3. To analyse the tax issues related to tax jurisdiction, tax nexus and allocation of tax value in the digital economy.
4. To assess how well the existing international tax frameworks deal with the tax issues arising from digital trade.
5. To assess impact of digitalisation on tax revenues and tax compliance by country.

5. Literature Review

Digital trade has revolutionized the global trade sector by enabling businesses to conduct trade activities across borders with minimal physical presence. This has created substantial challenges for the traditional tax system, designed to tax real estate and real economic activity. The consequences of digitalisation on taxation and tax collection have been the subject of extensive research, policy discussion and analysis by researchers, policy makers and international organisations. The initial discussions of taxation of digital commerce turned to the problems of traditional international tax principles. Tanzi (2000) has noted how the globalization of the economy and technology developments have undermined the capacity of the governments to tax economic activities in traditional terms. The author had stated that digital transactions do not respect geographical borders, and the difficulty of determining where a value is created, and where it is taxed. Cockfield (2006) noted that the notion of a permanent establishment is at the heart of international corporate taxation and is being put to the test by electronic commerce. Multinational companies can earn a significant share of the revenue in a country via digital platforms without any physical presence in the country, which restricts taxing rights of market jurisdictions, the study said. The Organisation for Economic Co-operation and Development (OECD, 2015) highlighted the Base Erosion and Profit Shifting (BEPS) concern with regard to digital business models. The report highlighted that multi-national technology companies often invest in intangible assets, IP rights and other transfer pricing arrangements in low-tax jurisdictions, to park profits. Such practices reduce the tax base of countries where economic activities and consumer markets are located. Devereux and Vella (2018) have suggested that the digital economy highlights the shortcomings of the current international tax system. Their analysis indicated that existing income taxation principles, based on place of residence and source of

income, are losing their relevance in the collection of profit generated through online channels. The authors proposed new nexus rules that are based on economic rather than physical presence.



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The notion of a “significant digital presence” was introduced by Hongler and Pistone (2015) as a possible alternative to taxable presence. According to their research, digital businesses should be taxed in countries where they have significant economic contacts with users, even if they have no physical footprint. This method has been used in a number of international tax reform discussions. Becker and Englisch (2019) analysed the increasing number of Digital Services Taxes (DSTs) in different countries. The authors discovered that the governments implemented DSTs in response to perceived shortcomings in international tax frameworks and to fair contribution of digital companies to national revenues. But they also pointed out that unilateral measures could result in more tax conflicts and risks of double taxation. Olbert and Spengel (2017) have investigated the tax burden on large, multinationals, and they conclude that the more digitalised a company is, the lower its effective tax rate will be compared to that of traditional companies. Their report underscored issues of tax fairness and the competitive neutrality, especially for domestic firms in a traditional tax system. Avi-Yonah and Clausen (2019) argue that international tax cooperation is crucial to address the challenges arising with digitalisation. They warned of “unilateral action on taxes could lead to trade conflicts and regulatory fragmentation. The authors proposed a coordinated global change in order to establish mechanisms that will lead to an equitable distribution of taxes. The two-pillar solution is an idea proposed by the OECD's Inclusive Framework on BEPS. OECD (2021) says that Pillar One tries to move taxing rights to market jurisdictions and Pillar Two sets a minimum corporate tax rate at the global level. The reforms tackle tax avoidance and in a more just world of international tax. In the article, Kofler, Mayr, and Schlager (2022) examined the challenges of implementing the Two-Pillar framework. The analysis found that the reforms are a major step forward, but there are still practical challenges to consider about how to implement the reforms, and what issues must be addressed to resolve disputes and implement administrative capacity. UNCTAD (2019) highlighted from the developing country point of view, that digital trade has specific taxation challenges because of scarce administrative capabilities and the rising significance of cross-border digital services. The report highlighted the importance of capacity development and international collaboration for effective taxation of the digital economy. There are also a number of scholars who have looked at the role of users in value creation. Becker and Englisch (2020) claimed that digital platforms have significant economic benefits from user generated content and data. For this reason, taxation systems ought to take into account user contributions as a consideration in the allocation of taxation rights among jurisdictions. The recent studies have been dedicated to the new technologies like cloud computing, AI and platform-oriented business models. The technologies also bring new difficulties into the tax administration realm because of its ability to increase the mobility of profits and intangible assets, Pistone and Weber (2019) observed. The authors highlighted the need to reform tax policies to not lag behind technological developments. To sum up, the literature shows that there is a wide agreement on the challenges facing international tax systems in their attempt to “catch up” with the global digital

trade. The main challenges include the lack of physical presence, profit shifting, tax base erosion, lack of a digital activities valuation and coordination of national tax authorities. Some reform proposals are underway such as the OECD Two-Pillar Solution and the Digital Services Taxes (DST), but they have important implementation challenges. More research is needed to create fair and effective tax systems to help provide sustainable revenues in a digitalized world.

6. Material and Methodology

The methodology used in this study is qualitative and descriptive research, with a descriptive approach using a large number of secondary data sources. The research is based on scholarly articles, books, government documents, policy documents, international taxation frameworks, conference proceedings and publications from international organisations like Organisation for Economic Co-operation and Development (OECD), World Bank, International Monetary Fund (IMF) and the United Nations Conference on Trade and Development (UNCTAD). The literature reviewed systematically was chosen to gain an understanding of the current issues concerning digital taxation, cross-border e-commerce, profit shifting, tax base erosion, digital services tax, and international tax reform. This study uses thematic analysis method to explore and analyse the key issues in the regulation and taxation of DTBAs. Significantly, the concept of permanent establishment, transfer pricing, digital presence, data-driven business models and the adoption of global minimum tax regimes are explored. Taxation policies of various countries and economic blocs are also analysed comparatively in order to evaluate differences in the regulatory approaches to digital trade. Data are gathered from secondary sources and then organized, classified and interpreted to look for patterns, trends and policy implications. The methodology enables an understanding of the dynamics of the digital economy and its impact on the existing tax framework, and offers avenues to the development of a fair, transparent and sustainable global tax framework.

7. Results and Discussion

Results:

When examining previous literature, policy papers and international taxation systems, it becomes evident that digital trade has massively posed a challenge to the traditional tax systems. Countries, where there are very few or even no physical addresses, can profit a lot from digital business models, as tax assessment and collection is more difficult here. The findings highlight that the challenge for governments across the world is and will be to ensure the generation of revenue, while simultaneously promoting economic growth and taxation in an equitable manner in the digital economy.

Table 1: Major Taxation Challenges in Global Digital Trade

Taxation Challenge	Description	Impact Level
Lack of Physical Presence	Digital firms operate without permanent establishments in market jurisdictions.	High
Profit Shifting	Profits are transferred to low-tax jurisdictions through intangible assets and transfer pricing.	High
Jurisdictional Conflicts	Multiple countries claim taxing rights over the same income streams.	High
Valuation of Digital Services	Difficulty in assessing the value created through data, algorithms, and digital platforms.	Moderate
Cross-Border Transactions	Large volumes of international digital transactions complicate tax monitoring.	High
Regulatory Fragmentation	Different tax rules across countries increase compliance complexity.	Moderate
Data-Based Value Creation	User-generated data contributes to profits but remains difficult to tax effectively.	High

The results indicate that the lack of physical presence conditions is the biggest difficulty. Traditional tax structures were built for business conducted in the real world, and are less effective in addressing virtually operated businesses spread across multiple jurisdictions. The erosion of taxable income in high market countries also remains due to profit shifting through transfer pricing and IP ownership.

Table 2: Perceived Effectiveness of Policy Responses to Digital Taxation Challenges

Policy Measure	Objective	Effectiveness Level
Digital Services Tax (DST)	Tax revenues generated from digital services within a country.	Moderate
OECD Global Minimum Tax	Reduce tax avoidance through a minimum corporate tax rate.	High
Base Erosion and Profit Shifting (BEPS) Framework	Prevent profit shifting and tax base erosion.	High
Equalization Levy	Tax foreign digital service providers operating in domestic markets.	Moderate
International Tax Cooperation	Harmonize taxation rules across countries.	High
Enhanced Digital Reporting Systems	Improve transparency and tax compliance.	Moderate to High
AI-Based Tax Monitoring	Detect tax avoidance and improve enforcement efficiency.	Emerging High Potential

The results reveal that multilateral approaches – particularly policy changes inspired by the OECD and BEPS measures – are perceived as more effective than unilateral tax policies. Digital Services Taxes have been effective in some nations to raise extra revenue, but also sparked worries over double taxation and international trade conflicts.

Discussion:

The findings reveal that the digitalisation has altered the interaction of economic activity and taxation for good. Digital trade is borderless, trades in virtual platforms and assets are intangible and concepts of tax are geographically anchored and rooted in presence. As a consequence, tax systems in place are not effectively levying the value generated in digital markets.

One of the new challenges that they have identified is the mobility of intangible assets like software, patents, trademarks and proprietary algorithms. These assets enable technology companies, including multinationals, to optimally distribute profits among jurisdictions, while reducing taxes. This practice results in unequal treatment of traditional business which continue to be taxable under old tax rules, and digital corporations.

Unilateral taxes, however, like DST and Equalization Levy, provide temporary patchwork solutions to the revenue that can be a headache around the globe. However, countries which are implementing independent digital taxes may have issues of trade retaliation, compliance, and overlapping tax claims.

More sustainable ideas are for example the OECD Global Minimum Tax and BEPS, which can be implemented in a global fashion. All these mechanisms have in common the objective of setting uniform standards in the allocation of taxing rights and diminishing the profit shifting possibilities. As long as they are accepted and well enforced on the international level, they are as effective.

Also critical to remember is how technology is playing a larger role in the tax administration. The use of AI, machine learning, and advanced data analytics in the realm of tax enforcement is becoming commonplace, with tax authorities leveraging these technologies to track digital transactions, detect tax avoidance trends, and enhance compliance efforts. These technologies can be applied in a manner to facilitate transparency and minimise administrative inefficiencies in digital taxation.

From this research, it can be concluded that the current taxing system on digital trade based on the place of taxation needs to be changed to the value creation-based taxing of digital trade. International cooperation, updating tax policies and leveraging technology are all needed to ensure fair, effective, and sustainable tax treatment of the digital economy for policymakers. The next steps in tax reform should be dedicated to harmonisation of international tax standards, maintaining States' fiscal sovereignty and further developing the digital economy.

8. Conclusion

The business and consumer world have been changed in the past few years by the digital economy, and has left tax authorities worldwide with a new platform of opportunity (and difficulty). This is because the traditional tax system – which is geographically based and based on the place of transaction – is no longer fit for purpose in a world of digital value creation, cross-border e-commerce, cloud services and data-based businesses. The issues related to profit shifting, tax base erosion, country of taxable presence and territorial conflicts have emerged as prominent in the digital economy. This study highlights the need for a paradigm shift in the traditional tax principles for a fair, efficient and revenue sustainable digitalisation of trade. This has come as a reminder to the limitations of international tax law, as

it focuses more on multinational technology companies whose economic activities are not in the country where they have physical operations. Governments around the world have made a response to the challenge, introducing digital services taxes, reporting mandates and involvement in multilateral initiatives to modernize global tax governance. However, there are certain national differences that create issues of 'double taxation', tax and customs conflicts and compliance. The results indicate that coordination should be increased at the international level to create a harmonised tax system to reflect the particular characteristics of digital trade. The challenge of effective taxation in the digital age needs to strike a balance between innovation and economic growth and between ensuring public income is not lost and ensuring competition neutrality between businesses. To effectively navigate the changing landscape of digital business models, policies need to be transparent, flexible and technology neutral and reduce administration complexity and taxpayer burdens. Lastly, the future of taxing the digital economy is tied up in the ability to build sustainable and fair tax systems, with all actors involved in this process, including governments, international organisations and companies. Both tax systems need to be essentially overhauled and coordinated policy actions should be implemented to keep them relevant and effective, and fit for the future – a future in which the world is far more interdependent.

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