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Taxation, Digitalization of the Economy and the Digital Economy

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Executive summary

The purpose of this Working Paper is to provide a synthetic and pragmatic approximation to (i) the economic dimension of the digital challenge, (ii) the challenges posed within the tax sphere –with emphasis on its administration - and (iii) the possible options for responding thereto.

The figures shown in this document indicate some features of the challenge we are facing. In sum:

- a rapidly increasing percentage of retail sales (up to 9% in the USA or 15% in China) and of total corporate sales (18% in Europe and up to 33% in Ireland) are made through electronic commerce;
- the platforms of the so-called collaborative economy are expanding their activity, especially in such sectors as accommodation, travelers' transportation, banking and professional services, and, although their global dimension is still reduced in terms of GDP or employment, their sectorial impact and growth is noteworthy;
- others sectors are transferring their activity to the digital sphere in an accelerated manner, as is the case of on-line gaming (17.5% of the gaming market in Europe, for example) or, above all, advertising (where the digital activity already represents 35.2% of expenditures and it is anticipated that it will reach 50% by 2021), with a strong trend toward the concentration of market shares in a few companies (Google and Facebook, according to estimates, account for 62% of the on-line advertising market -44%; 18%- and 25% of the global advertising market -18 and 7%, respectively-);
- the measurement of the –increasing- effects of electronic commerce in international commerce is still very deficient: due to the existence of minimum thresholds for customs declaration; the infra-valuation of the downloading of digital products/services; the lack of methodologies for the individualized measurement of commerce derived from the collaborative economy;
- E-Money represents a very reduced percentage of total payments (in no case does it exceed 1%), nevertheless, it plays a very relevant role as accessible instrument of financial inclusion in the less-developed countries (in 2015 the number of mobile money accounts was equal to or above that of bank accounts in 21 countries in Africa). With respect to cryptocurrencies, in 2017 users were estimated between 2.9 and 5.8 million. In October 2018, the capitalization in this market was 219 billion dollars, of which 114 (52%) corresponded to the Bitcoin, although there are over 2,000 cryptocurrencies.

Within the traditional taxation framework, procedures and rules have been developed whose effectiveness is challenged by the very characteristics of digitalization of the economy and the new Digital Economy; thereby stressing in some cases already existing challenges, while in others creating new challenges. In order to render taxes effective, it is necessary that the administrations have: a) information on the agents and their economic activities; b) legislative capacity (sovereignty) to determine their obligations; and c) administrative capacity (feasibility) for the efficient application of the legislation. In this document, we endeavor to summarize the new digital challenges in these spheres, according to the responses we may provide within this new context to the basic questions for the determination, compliance and control of tax obligations:

1. Who is obliged to pay taxes -taxpayer – and which are the applicable tax figures –taxable event? Which is closely related to another question: Where -residence; permanent establishment; place of taxable event – is the tax applied?
2. How much –quantification of the tax base – is subject to taxation?
3. How is the payment of the tax administered and controlled?

Lastly, we have grouped the problems and their possible solutions, by distinguishing according to business models:

1. Cross-border electronic commerce of goods and services
 - 1.1. Goods and services digitally acquired from a nonresident company sent –being digital items or not -, directly and individually to the consumer
 - 1.2. Goods acquired digitally from a nonresident company, although with essential elements for their success found in the country where the market is located
 - 1.3. Provision of new digital services: calculation or storage in the cloud; acquisition of 3-D printing licenses
2. Digital business models by nonresident companies that achieve a return on the local users data
 - 2.1. Indirect achievement of a return -marketing/advertising- from the data of free service users
 - 2.2. Collaborative economy
3. Cryptocurrencies and ICOs (Initial Coin Offerings)

1 Introduction

Digital technologies for processing information and the exchange of data transform the way in which many traditional economic activities are carried out, for example: the purchase /sale of goods and services –by modifying their nature, the transmission channels, the physical location of the purchaser/seller or the means of payment; the production process itself; financing of the activities; or the analysis of markets or advertising. At the same time, they create new spheres of activity that were previously nonexistent –or which had a much lower dimension- and create new business (free services –social media, searchers, storage of information – which may be used in a derived manner for analyzing demands, advertising and marketing; platforms for the exchange of services between individuals –leases, transportation services, working and professional activities, etc.-; computer services in the “cloud”; etc.).

This digitalization of the economy (digital transformation of traditional activities) together with the emergence of new digital economic models (the new digital economy) imply, among its many consequences –social, competitive, labor -, a challenge for traditional taxation, in terms of adaptation of its classic concepts and mechanisms as well as in the determination of new alternatives.

The purpose of this Working Document is to offer a synthetic and pragmatic approximation to (i) the economic dimension of the digital challenge, (ii) the challenges it implies in the tax sphere –with emphasis on its administration - and (iii) the possible options to respond thereto¹.

1 Fundamental in the compilation of challenges and options have been the works of the OECD in the BEPS Project. In particular, the Final Report on Action 1 regarding the Digital Economy (2015), and its 2018 Interim Report: “On the tax challenges arising from digitalisation”. Additionally, in VAT use has been made of “Mechanisms for the Effective Collection of VAT/GST. Where the supplier is not located in the jurisdiction of taxation” by the OECD (2017).

2 The economic dimension of the digital challenge

Given the existing overlapping between the incorporation of digital innovations in the traditional businesses and what we could actually classify as new Digital Economy, it is difficult to quantify the economic dimension of the phenomenon. Nevertheless, we can try to extract some objective illustrative indicators of its impact on several key areas –electronic commerce sales; employment and level of activity in the collaborative economy; digital advertising; on-line gaming; international transactions, electronic means of payment (E-Money) and cryptocurrencies; global estimates of the Digital Economy – which, subsequently, we shall link to the challenges faced in its taxation.

2.1. Electronic commerce

In 2017, in the United States electronic commerce represented 9% of retail sales, when in 1999 it was only 0.6% (Graph 1), a spectacular increase that is based on persistently high annual growth rates –a mean of 19.1% - well above the increase of total sales -3.3%- (Graph 2).

Graph 1. Electronic commerce retail sales in the United States.



Source: US Census Bureau (<https://www.census.gov/retail/index.html>)

Graph 2. Retail sales growth in the United States



Source: US Census Bureau (<https://www.census.gov/retail/index.html>)

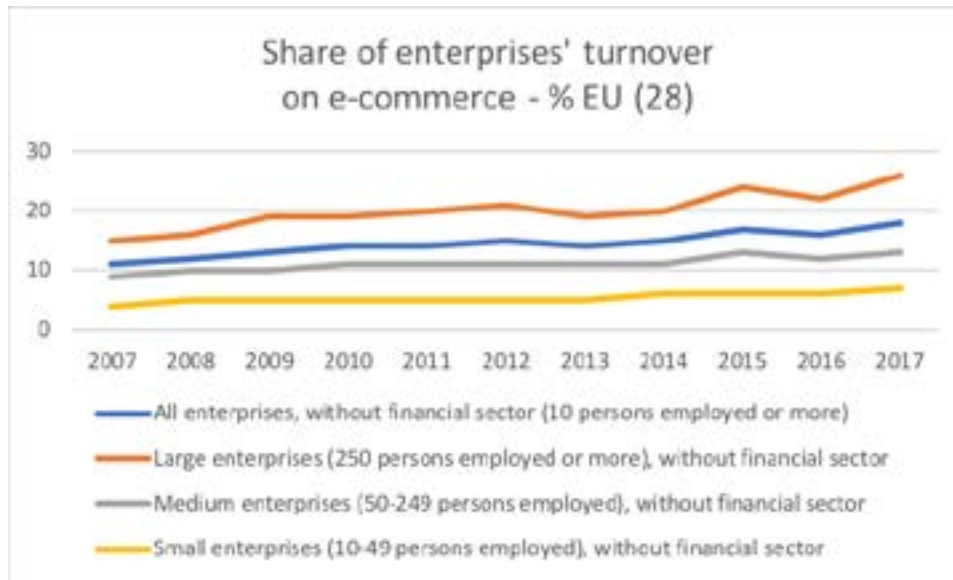
The National Bureau of Statistics of China is, as well, focused on on-line retail sales of goods and services, which in 2017 amounted to 7.7 billion (millions of millions) yuans, with an annual growth of 32.2%. The greater part of on-line sales (5.4 billion, with a growth of 28%) corresponds to physical goods², which represent 15% of all retail sales of consumption goods.

The electronic commerce figures in the European Union, even though not comparable with those of the United States or China since they use a different methodology –fundamentally because they measure electronic commerce with respect to the total sales of companies, not only retail commerce- also show similar conclusions, although with certain variations.

In average, 18% of the companies' sales revenues in 2017 were from what is classified as electronic commerce (reaching 26% in the case of large enterprises), with a very significant growth again starting at 11% in 2007 (Graph 3). These figures, at the national level, range between 33% in Ireland and 4% in Greece (Graph 4).

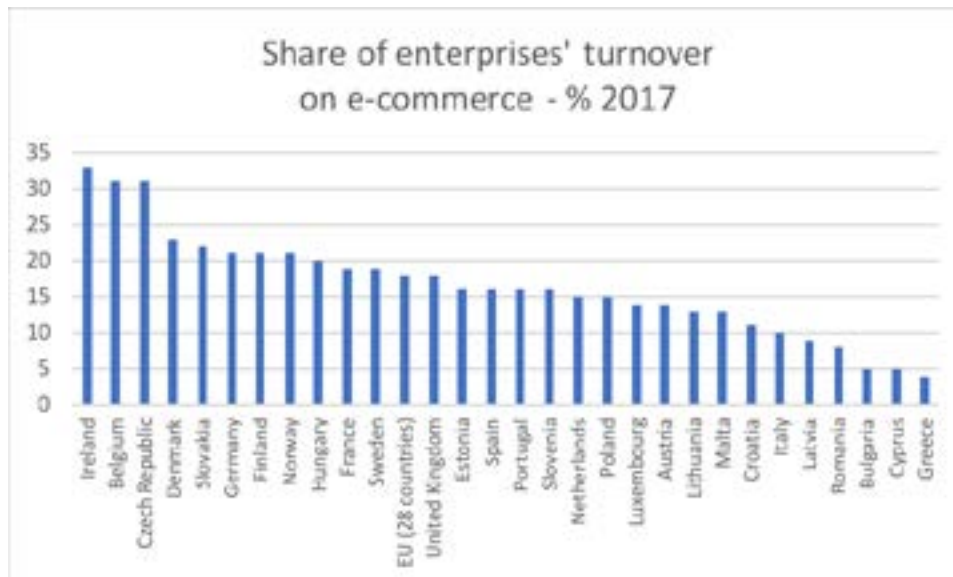
² On-line sales of food grew 28.6%, clothing 20.3 and the rest of goods, 30.8%.

Graph 3. Revenues from sales and electronic commerce in the European Union



Source : Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics)

Graph 4. Revenues from sales and electronic commerce in the countries of the European Union

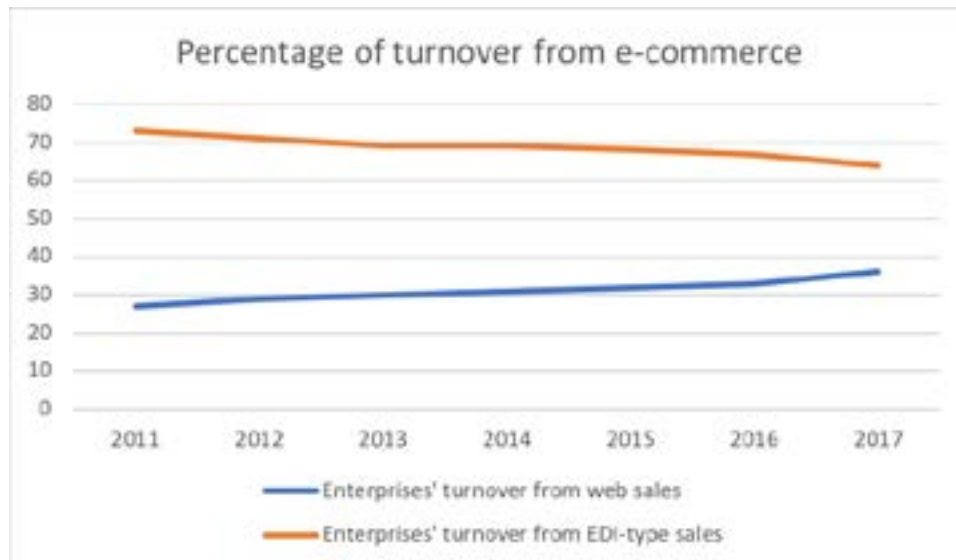


Source : Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics)

The differentiation shown in Graph 5 is useful to better understand these figures. It shows that sales via web (which are traditionally classified as retail sales to ultimate consumers), although

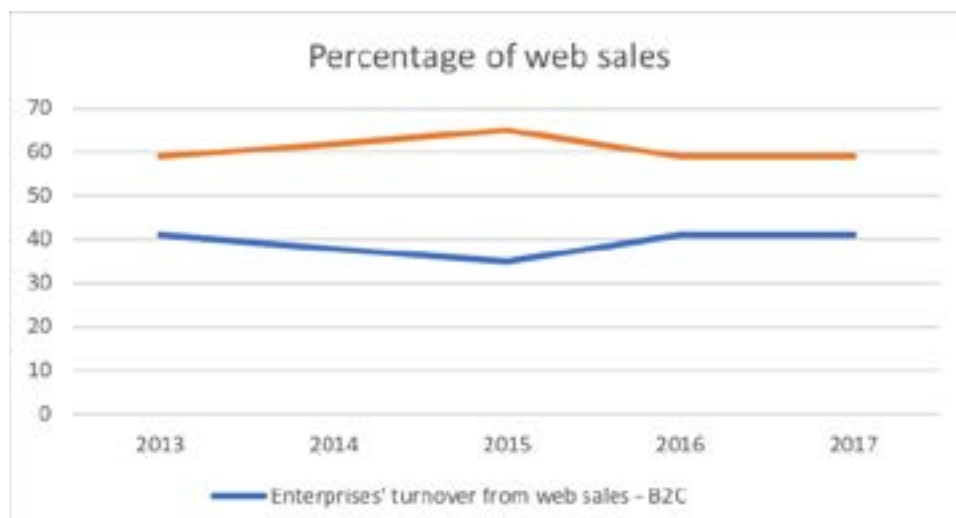
increasing, only represent 36% of the total, while those classified as EDI (Electronic Data Interchange or Extensible Markup Language –XML- format which allows an automated treatment of the requests, used in wholesale commerce) are the remaining 64%. Graph 6 contributes additional information in that same direction on disaggregating total electronic commerce sales carried out through web pages as 41% of ultimate consumer sales and 59% to other companies or public organizations.

Graph 5. Electronic commerce (web/EDI) in the European Union



Source : Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics)

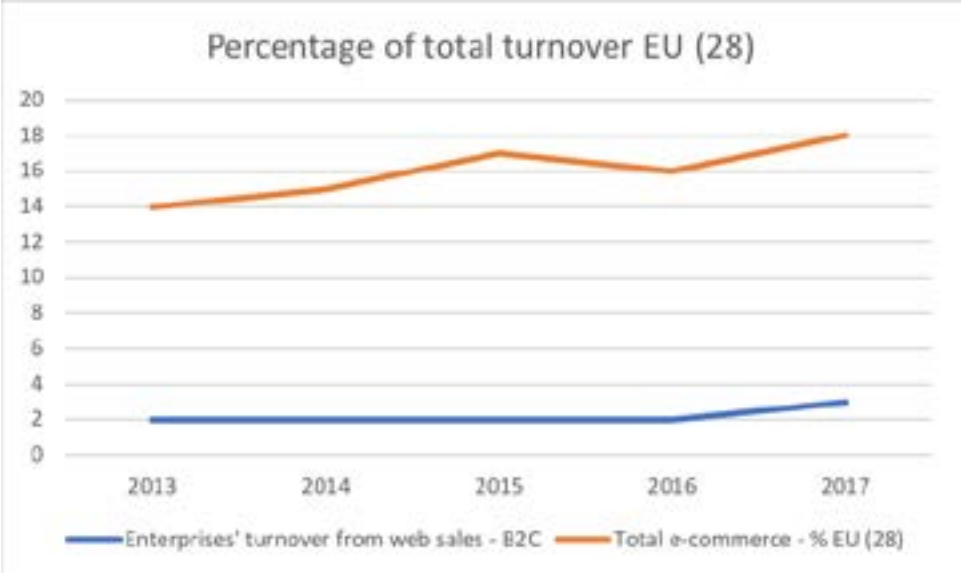
Graph 6. Electronic commerce (B2B/B2C) in the European Union



Source : Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics)

In sum, as seen in Graph 7, of total revenues from sales by the companies, only 3% are sales via web to the ultimate consumer, even though, as we saw at the beginning, up to 18% falls within the electronic commerce category.

Graph 7. Electronic commerce (web/total) in the European Union



Source : Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics)

2.2. Collaborative economy: employment, level of activity, sectors

There are no official data in this sphere, although several recent studies contribute estimates. In the case of the European Union, Vaughan and Daverio (2016) provide the summarized results in Table 1.

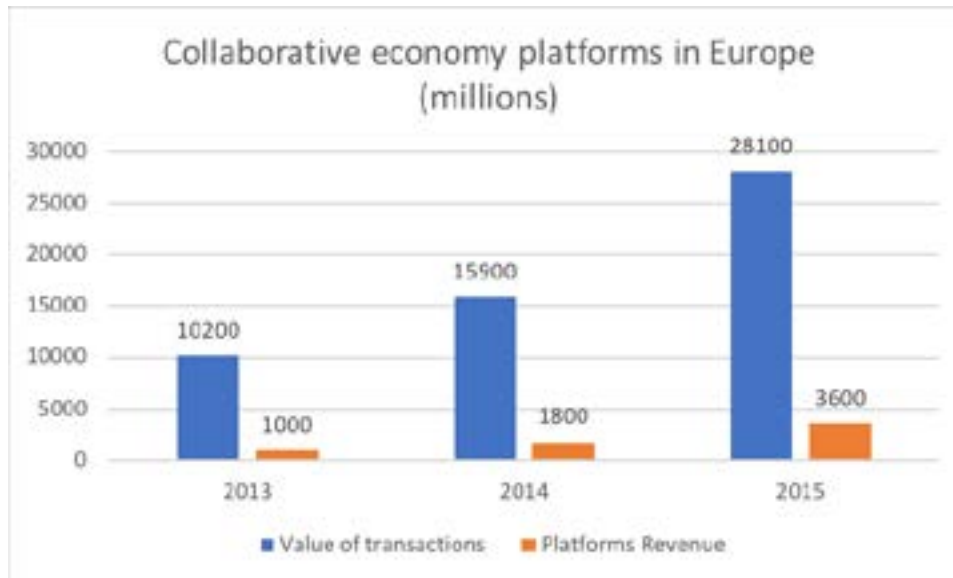
Table 1. Revenues and volume of transactions of the collaborative economy platforms in Europe (€millions, 2015)

Sector	Platforms Revenue 2015 (m)	Value of transactions 2015 (m)	Rev/Transact. (%)
P2P Accommodation	1150	15100	7,6
P2P Transportation	1650	5100	32,4
On-demand household services	450	1950	23,1
On-demand professional services	100	750	13,3
Collaborative Finance	250	5200	4,8
TOTAL	3600	28100	12,8
% GDP	0,02	0,19	
(€millions)	2013	2014	2015
Value of transactions	10200	15900	28100
Growth (%)		55,9	76,7
Platforms Revenue	1000	1800	3600
Growth (%)		80,0	100,0
Rev/Transact. (%)	9,8	11,3	12,8

Source: Vaughan and Daverio (2016)

According to this study, the growth of the activity in these platforms is spectacular, in terms of value of the transactions (76.7% from 2014 to 2015) as well as revenues (a 100% increase). Nevertheless, when one considers these data in relation to the total European GDP, one observes its still reduced dimension (the value of the transactions is equivalent to 0.19% of GDP and revenues to 0.02%).

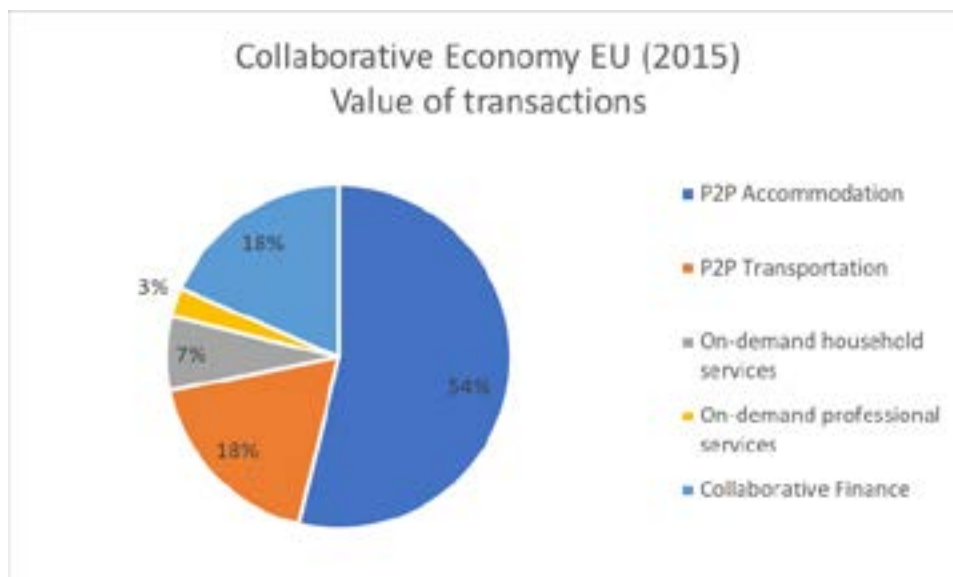
Graph 8. Collaborative economy platforms in Europe (millions)



Source: Vaughan and Daverio (2016)

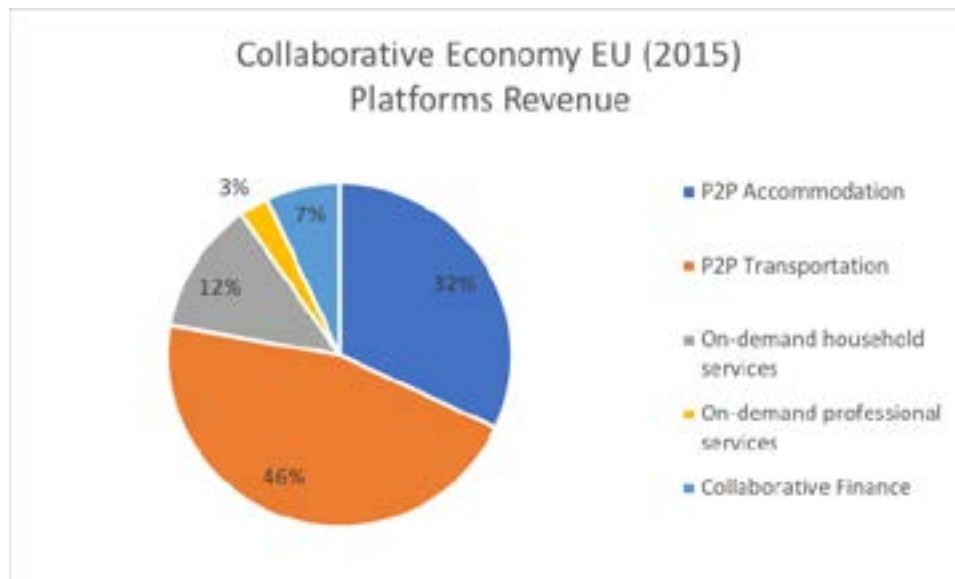
By sectors, the accommodation platforms represent 54% of the value of the transactions. They are followed by those devoted to transportation and financing -18% each - (Graph 9), while in terms of revenues (Graph 10) transportation is in first place -46%- followed by accommodation -32%- (which reflects the greater margin of benefits of the transportation platforms, 32.4% in 2015 - Table 1- vis-a-vis, for example, accommodation, with 7.6%).

Graph 9. Collaborative economy in the EU (2015): Value of transactions by sectors



Source: Vaughan and Daverio (2016)

Graph 10. Collaborative economy in the EU (2015): Value of revenues of platforms by sectors



Source: Vaughan and Daverio (2016)

Other studies adopt different methodological options, although results are within the same range. Thus, the study of the European Commission (2018) calculates for 2016, revenues from the platforms of 3.800 million and revenues from actual service providers of 22.700, for a total of 26,500 million (0.2% of GDP), very similar to the 2015 estimates by Vaughan and Daverio. The main difference between both studies is in the relative importance of sectors, since, in this case, finance sector is in the first place, with 38% of revenues, followed by accommodation, 24%, professional services, 22% and transport, 16%³.

This second study also provides employment data linked to the activity of the platforms. The global figure amounts to 394.000 jobs⁴, 0.15% of total jobs in the EU, with transportation and accommodation being the main sectors (31 and 29% of total, respectively; Graph 11)⁵. This global figure is slightly lower than that provided by other studies for the United States -Katz and Krueger (2016), calculate 0.5%-. A different issue is that the number of persons stating that they, at some time, may have participated in these platforms, although only for purposes of obtaining complementary income and not as main occupation, is much greater.⁶

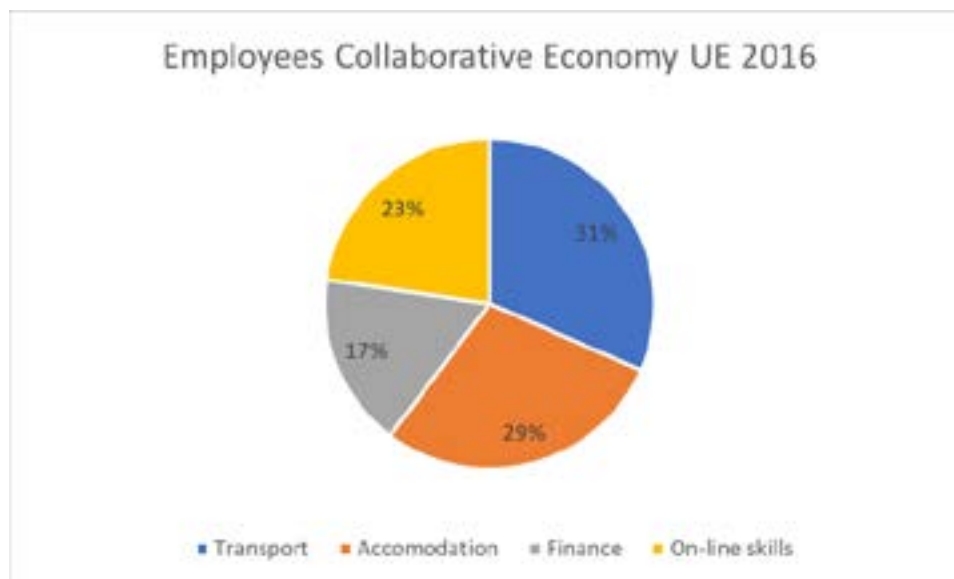
3 Additionally, in this case there are no differences in the profitability ratio of the different sectors.

4 The vast majority corresponds to service providers and contents (not to direct workers of the platforms).

5 This document provides great additional information, with disaggregated data by countries and/or sectors.

6 Pesole et al (2018) and McKinsey & Company (2016) provide more additional recent information on this phenomenon. The specific figures provide a very variable range depending on the methodologies and the definition of the group analyzed.

Graph 11. Collaborative economy in the UE (2016): Job by sectors



Source: European Commission (2018)

2.3. Sectors: on-line gaming

The statistics available place Europe as leader in this sector, with a market share of 47.6%, followed by Asia/Middle East and North America (Graph 12). The nominal value of this sector is 34,600 million, 16,500 only in Europe (0.11% of its GDP⁷), which would represent 17.5% of the total gaming market in this region (37% corresponds to sports stakes, followed by on-line poker, 24%, virtual casinos, 22%, and others, 17%).

7 It should be noted that some countries have specialized themselves in this sector, as is the case of Malta, where in 2016, 13% of its GDP was linked to Gaming, mainly on-line (data from the Malta Gaming Authority; <https://www.mga.org.mt/>).

Graph 12. On-Line Interactive Gaming. Market Shares 2015 (%)



Source and Notes: Gross Gaming Revenue (GGR: stakes minus winnings); H2 Gambling Capital, May 2016; <http://www.h2gc.com/>. Quoted by European Gaming & Betting Association, www.egba.eu

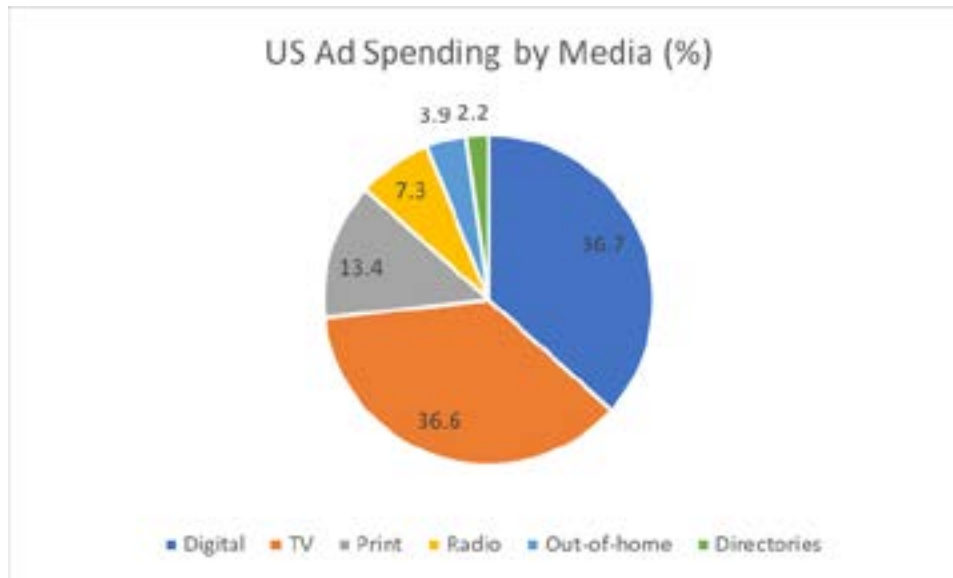
2.4. Sectors: On-Line Advertising

This is one of the sectors showing the most spectacular progress of the digital economy and its consequences in terms of the concentration of the competition. According to data from eMarketer (www.emarketer.com), in 2016, digital advertising expenditure at the world level was 191,000 million dollars, with an annual rate of increase of 20.1%, representing 35.2% of total advertising expenditure in the media, and its projection for 2021 is that they reach 375,800 million, with a digital share of 49.6%.

By regions, on-line advertising achieves its highest market shares in Asia-Pacific with 39.4%, followed closely by North America (36.8%), Central and Eastern Europe (36.6%) and Western Europe (35,4%). Latin America (20.3%) and Africa and the Middle East (13.3%) would be the regions with less presence.

Differentiating by channels (Graph 13), the U.S. data for 2016 shows digital advertising already in first place (36.7%), thereby surpassing television (36.6%) and that carried out in the printed media (13.4%).

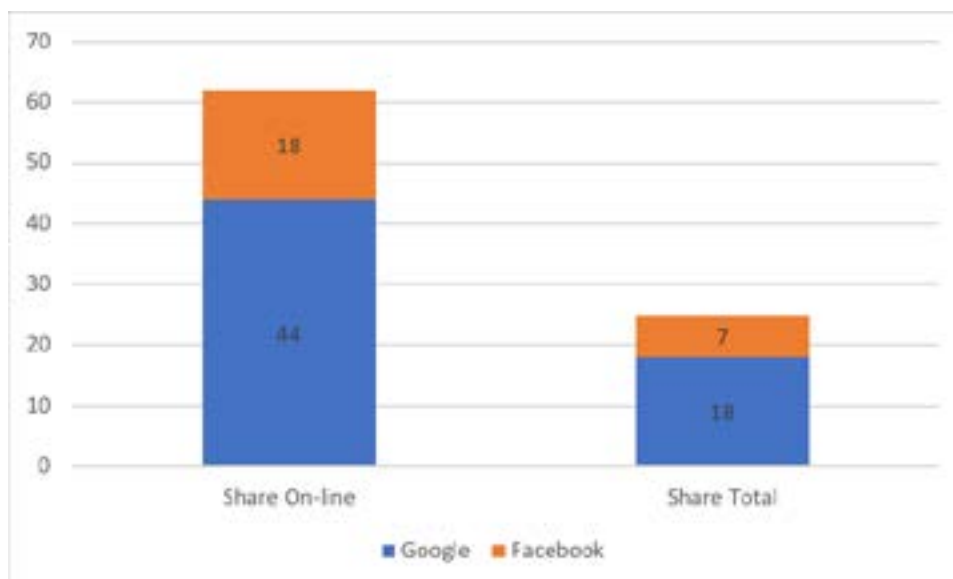
Graph 13. Advertising through Media (%). US 2016



Source: www.eMarketer.com

In addition, the Statista portal provides data on the market share of the two main companies of the sector: Google and Facebook. Both of them together would represent 62% of the on-line advertising market (44% Google; 18% Facebook) and 25% of the global advertising market (18 and 7%, respectively) in 2017, with a spectacular growth in these past years (from 47% on-line and 9% global in 2012).

Graph 14. Google and Facebook market shares. 2017



Source : <https://es.statista.com/>

2.5. Digital Economy and international transactions

The economic activity derived from electronic commerce may imply in many cases, operations of an international nature through the intermediation of platforms, physical distribution of goods or delivery of products or services digitally acquired and distributed. However, as indicated by the IMF (2018), its measurement is still very defective. A survey carried out by the IMF and OECD in 2017 with respect to its measurement for preparing the Balance of Payment in 74 countries shows some of the problems:

- Due to the existence of minimum thresholds for the customs declaration, only half of the OECD countries and a minority of the rest estimate⁸ its importance (USA, for example, estimates that in 2015 they would reach 2.15% of imports and 0.75% of exports). This would affect the measurement of the effect of electronic commerce on exports/imports of low value goods (which in many cases are tax exempt).
- The downloading of digital products/services (software; e-books; music; etc.) are undervalued, especially as imports. The means mainly used for their detection are payments through credit cards.
- Only three of the surveyed countries –United Kingdom, Denmark and Canada – declared that they were analyzing methodologies to individually measure commerce derived from the collaborative economy. Likewise, only 15 per cent of the OECD countries and six per cent of the remainder could identify payments to nonresident digital platforms. Two thirds of the OECD countries and 90% of the rest cannot clearly identify the operations carried out through foreign intermediaries.

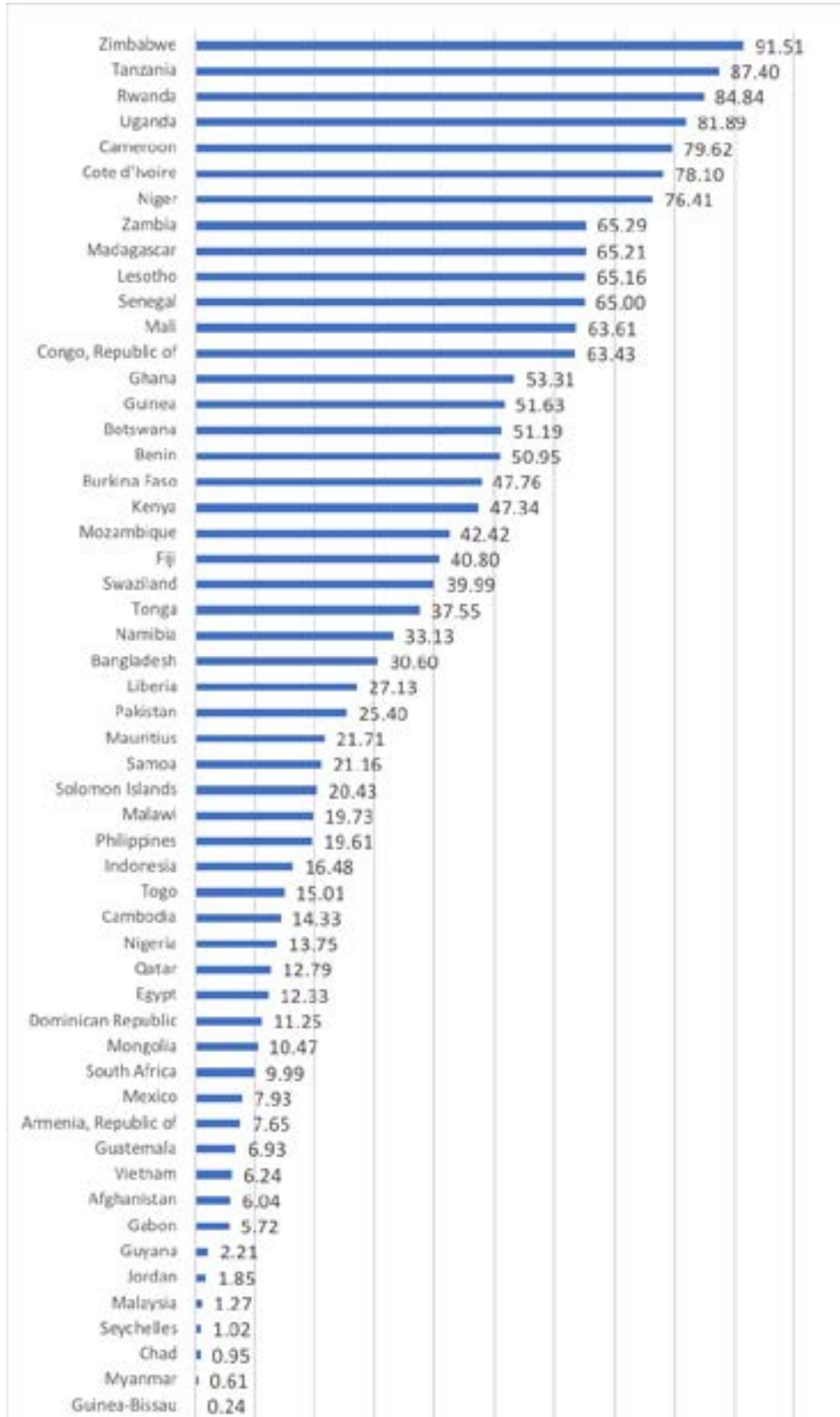
2.6. Means of electronic payment (E-Money) and cryptocurrencies

The electronic money (stored in a card, device or server and used for payments to third parties⁹) represents a very small percentage of the monetary supply and total payments (in the countries analyzed in 2015 by the IMF (2018) it does not exceed in any case 1% of payments not made in cash; Nigeria holds first place among developing countries –with 0.94- while Singapore with 0.24% and Italy, 0.21% lead the advanced economies). However, it plays a very important role as accessible instrument of financial inclusion in the less developed countries (in 2015 the number of mobile money accounts was equal or above that of bank accounts in 21 African countries; Graph 15).

8 Using data from mail services, credit cards, administrative customs information, etc.

9 Prepaid cards of generalized use, web applications, and storage associated to mobile telephone (mobile money). Excluded are cryptocurrencies or payments with mobile telephone although associated to a bank account.

Graph 15. Percentage of “mobile” accounts (E-money) with respect to total



Source: IMF (2018), using the Financial Access Survey (2017)

With respect to cryptocurrencies, in 2017 the estimates were between 2.9 and 5.8 million single active users of electronic money¹⁰. According to the <https://coinmarketcap.com> portal in October 2018¹¹ the capitalization in this market was 219 billion dollars, of which 114 (52%) were Bitcoins, although there are over 2,000 cryptocurrencies -1,200 of them with a capitalization above one million dollars – with a daily negotiation volume of 11 billion.

2.7. Global estimates of the Digital Economy and its potential tax impact

As pointed out by the IMF in its recent publication: “Measuring the Digital Economy”, IMF (2018), the lack of consensus regarding the definition of the Digital Economy or the Digital Sector and its statistical reflection renders its measurement difficult, although the existing evidence always points at figures below ten percent, in valued added as well as in income or employment¹². However, no one can doubt its relevance. At present (Table 2): over 4,000 million (more than half of the world population, although with regional differences, Graph 16) have access to Internet, generally from mobile devices, and around 40% of the population is active user of the social media, with estimates of an average use of Internet of around six daily hours.

Table 2. Internet users

2018	Millions	%
Population	7593	100
Internet users	4021	53
Active Social Media users	3196	42
Active Mobile Internet users	3722	49
Active Mobile Social Media users	2958	39

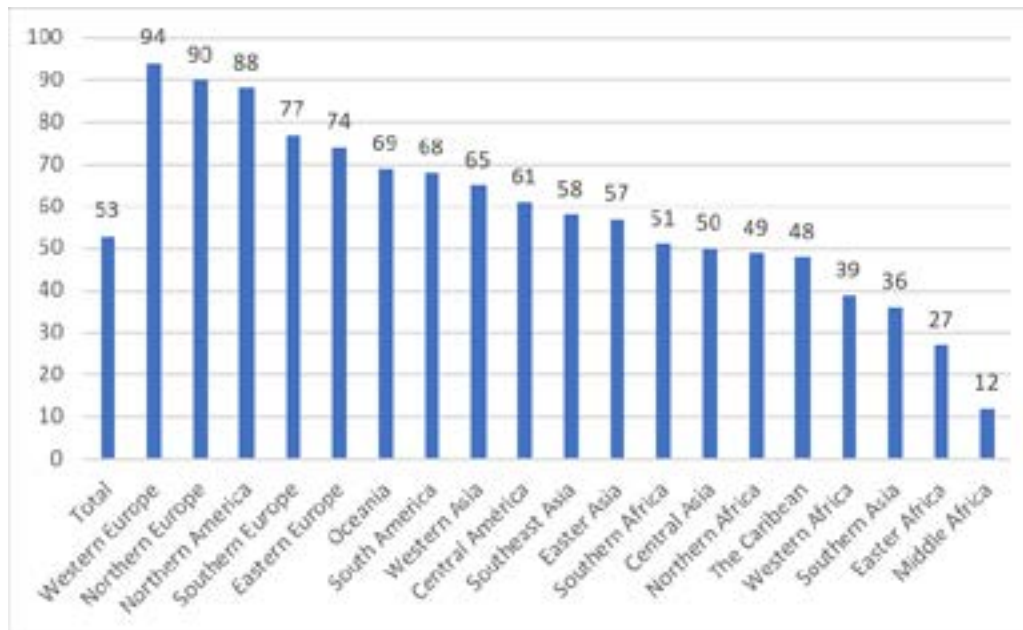
Source: Hootsuite “Digital in 2018”

10 IMF (2018) based on Hileman and Rauchs (2017).

11 On October 9, to be precise, something important given the extreme volatility of this market.

12 For example, the measurements of the so-called e-GDP carried out by BCG for 2016 are within this range: 8% South Korea, 6.9% China, 5.6 Japan and India, 5.4% USA, 4% Germany, 3.6% Canada, 3.4% France.

Graph 16. Internet Users by Region (in percentage of population)



Source: Hootsuite “Digital in 2018”

In any case, in this article our interest is focused on the potential impact of digital development on the way taxation is implemented and not so much globally on the economy in terms of the evolution of productivity, growth or the level of employment¹³.

In this sense, the figures shown in this section likewise show some features of the challenge we face. They will be analyzed in the following section, where we will reflect on the effects of digitalization in the sphere of taxes and their administration. In sum:

- a rapidly increasing percentage of retail sales (up to 9% in the USA or 15% in China) and of total sales of companies (18% in Europe and up to 33% in Ireland) is carried out through electronic commerce;
- the platforms of the so-called collaborative economy are expanding their activity, especially in the accommodation, travelers’ transportation, banking and professional services sectors, and, although their global dimension is still reduced in terms of GDP or employment, their sectorial impact and growth is noteworthy;
- other sectors are transferring their activity to the digital sphere in an accelerated manner, as is the case of on-line gaming (17.5% of the gaming market in Europe, for example) or, above all, advertising (where the digital activity is already attributed with 35.2% of the expenditure and it is anticipated that it will reach about 50% by 2021), with a strong trend toward the concentration of market shares in a few companies (Google and Facebook, according to estimates indicated represent 62% of the on-line advertising market -44%; 18%- and 25% of the global advertising market -18 and 7%, respectively-);

13 All of which, obviously will also have consequences on the evolution of the tax bases.

- the measurement of the –increasing- effects of electronic commerce in international trade is still very deficient: due to the existence of minimum thresholds for the customs declaration; the undervaluation of the downloading of digital products/services; the lack of methodologies for individually measuring commerce derived from the collaborative economy;
- electronic money represents a very reduced percentage of the total payments (does not in any case exceed 1%); however, it plays a very relevant role as accessible instrument of financial inclusion in the less developed countries (in 2015, the number mobile money accounts was equal or greater than that of bank accounts in 21 countries in Africa). With respect to cryptocurrencies, in 2017, they were estimated between 2.9 and 5.8 million users; in October 2018, the capitalization in this market was 219 billion dollars, of which 114 (52%) were Bitcoins, even though there are over 2,000 cryptocurrencies.

3 Digital challenges in the field of taxation

Within the traditional framework of taxation, procedures and rules have been designed whose effectiveness is challenged by the characteristics of the digitalization of the economy and the new digital economy. In some cases, they accentuate the existing challenges, and, in others, they create new ones.

To be effective, taxes require that administrations should have: a) information on the agents and their economic activities; b) legislative capacity (sovereignty) to determine their obligations; and c) administrative capacity (feasibility) to apply the legislation efficiently.

In this section, we will try to summarize the new digital challenges in these areas (information, legislative capacity, and administrative capacity) from the answers that in this new context we can provide to the following basic questions for the determination, compliance and control of tax obligations:

1. Who is obliged to pay taxes -taxpayer – and which are the applicable tax figures – taxable event? Which is closely related to another question: Where -residence; permanent establishment; place of taxable event – is the tax applied?
2. How much –quantification of the tax base – is subject to taxation?
3. How is the payment of the tax administered and controlled?

Table 3

Digital challenges in the field of taxation	
To tax effectiveness	To traditional principles of taxation
a) Information on agents and their economic activities	a) Who is liable for tax (passive subject), and what are the applicable tax figures – taxable event-? Where is it taxed? -residence; permanent establishment; place of the taxable event?
b) Legislative Capacity (sovereignty) to determine their obligations	b) How much is subject to tax? Quantification of the tax base?
c) Administrative capacity (feasibility) to efficiently implement the legislation	c) How is the tax payment managed and controlled?

3.1. Who? Which taxes? Where?

Traditional rules to establish taxpayers are based on:

- determining the nexus, for tax purposes, through the residence or existence of a permanent establishment (based on a physical presence, decision making, risk-taking)

for the taxation at source -assuming that the creation of value lies in that jurisdiction- in order to tax corporate income -with territorial, worldwide or mixed criteria-, including mechanisms concerning double taxation relief;

- in a complementary manner, and as an exception to taxation in the country of origin, certain passive income paid or transferred abroad by resident companies are subject to statutory -or those established in the various double taxation agreements- withholding tax rates: dividends, interest and royalties; remaining available the residual taxing rights to the country of residence of the recipient of such income;
- the principle of destination for taxation of consumption, based, in general, on the charge and collection of the tax by the seller of the goods or provider of services;
- in the case of cross-border operations, customs serve as a check point for the application of taxes on consumption (general and specific) and customs duties for material goods (with possible exceptions for imports of small value); while for services purchased by companies, the mechanism of reverse charge is prioritized, with the domestic buyer in charge of applying the tax, which later could be deduced for those of VAT type ; in many cases, low-cost services or goods destined to final consumers were in practice exempt of taxation;
- perception of personal income (dependent employment, business or professional activities, capital income) generate recipient's tax liability -usually by self-assessment- and payers withholding obligation -employers and financial institutions-; in addition employers collect social contributions;
- property ownership, if taxable, cause a self-assessment obligation, while tax administration controls the values from the public records.

As we have seen, an increasing share of consumption is channeled digitally, by either acquiring digital goods or services, digitally buying physical assets -of low individual value -through remote shopping or interchanging services via online platforms.

In all these cases an identification problem arises, both for suppliers and buyers. Suppliers may be located in another jurisdiction for tax purposes and/or act informally through platforms, without need for a physical presence in the market country, where certain new business models may also be generating a significant part of the value of their products using data from users. Consumers can receive low-value products or digital products -without border control- and services directly from a company resident abroad or from an individual -using an intermediary platform- not registered for tax purposes in their country. In some cases, ownership of assets may also be an issue¹⁴, affecting both corporate and personal income taxes and taxes on consumption¹⁵ or on the property¹⁶.

Of course, some of these problems are not new and have already been dealt with under the BEPS initiative in the case of direct taxation of companies -for example, in relation to fraudulent practices to avoid considering a permanent establishment, certain aspects of the treaty abuse, mismatches

14 For example, in the case of cryptocurrencies and "Coin Initial Offerings" (ICO).

15 In this area, the problems are multiplied in countries with decentralized indirect taxation, such as Brazil or the US, and in the most integrated commercial areas, especially the European Union. In all these cases, the inability to control the application of the destination principle seriously distorts trade and creates incentives for relocation and race-to-the-bottom tax competition, eroding tax bases and collection.

16 Besides, if any, other taxes on the performance of economic or financial transactions activities.

by hybrid mechanisms or the treatment of CFCs (Controlled Foreign Company)- and in OECD's recommendations, for example, for the taxation of consumption services and low-value goods at destination. However, digital businesses ability to operate remotely from different jurisdictions without physical presence in the market -or with a presence that, until now, does not constitute a permanent establishment, such as storage and logistics- as well as the consumers' ease to access those goods and services, increase the risks and complexities for tax control.

3.2. How much?

The taxation of income is generally based on the determination of their net worth, income minus expenses correlated with activity, at market prices to unrelated entities ("arm's length basis"). The problems associated with this calculation are well known and are present beyond the Digital Economy.

Again, we must be aware that the BEPS initiative has catalogued and analyzed them, proposing alternatives for controlling transfer pricing, financial expenses, losses, intragroup costs agreements or intangible valuation. However, in this case, digitalization and the new digital business models multiply the risks. On the one hand, the importance of intangible and operations carried out remotely by technology companies of a same group, including cloud computing, is much higher and faces serious problems for the application of traditional transfer pricing control mechanisms.

Furthermore, some of these new business models offer free services to users while exploiting their data to generate paid services (advertising, marketing, advice ...) or are intermediaries -for a fee- in a local market of individuals who exchange goods or services. In both cases, although they have no residence or permanent establishment in users' country, these companies would be monetizing these data. This constitute an essential factor in the value creation process, even if the analysis is performed in another jurisdiction where the company is resident, and a tax should be established in the source country/market.

In the field of personal income taxation, problems also appear, especially with sharing economy platforms where barriers between dependent employees' activity or the rental of certain private assets and autonomous professional/business activities become blurry, as it does their tax treatment.

Concerning the taxation of consumption, determining the basis and the applicable rates based on more or less complex but just national rules, generally in local currency, also face challenges arising from the existence of supply and demand agents in multiple jurisdictions with various legislation, currencies and different registration procedures.

3.3 How?

Inevitably related to the above mentioned difficulties is the problem of how to manage and control tax obligations in this digital environment. In general, the administration of taxes is based on:

- access to third party information;
- registration and reporting requirements of those involved in an economic transaction;
- withholding through revenue payers or intermediaries in consumption;
- the self-assessment, provided -and oriented- in many cases through “drafts” or pre-populated tax returns using the information from third parties;
- taxable subjects’ inspection and sanction mechanisms;

This combination of reliable information, cooperation from intermediaries in the economic transaction, promotion of voluntary compliance and enforced control is weakened when any of these elements are missing, and it is the case for the Digital Economy. These deficiencies are common, especially because of the possibility that the suppliers or intermediaries (platforms) are not resident for tax purposes in the country of consumption, or the means of payment¹⁷ do not have¹⁸ a formal financial traceability.

¹⁷ Cryptocurrencies, for example.

¹⁸ Although, as in previous sections, it is obvious that the problems are not unique to the digital area -retail sales; payments in cash; transactions between individuals; “Ghost companies” and false invoices; international operations and carousel fraud; etc.- although they expand in the digital field. In any case, we must also note that some of the innovations of digital markets may help in the future to “formalize” areas of economic activity that were previously difficult to control, as we will see in the next section.

4 Options for adapting taxation to the digital environment

A classic expression of popular wisdom that applies to complex problems is contained in the saying “can’t see the forest for the trees”: to be lost in the details and be unable to see the problem globally. However, in this case, the opposite may be happening and perhaps the “digital forest” is preventing us from seeing the trees. Not all trees are alike, nor do they have the same problems, nor can they be treated with the same solutions. Therefore, this section will adopt an approach based on the presentation of the issues and possible solutions by distinguishing the business models.

4.1. Trans-border electronic commerce of goods and services

Within this category, we will differentiate three business models whose distinctive features may require a different tax treatment

4.1.1. Goods and services digitally purchased from a non-resident company and sent -whether digital or not- directly and individually to consumers

This is the case of retail web pages selling physical products to be exported as low-value goods, the supply of audiovisual content to be consumed through Internet, the downloads of digital goods, and even the online gaming.

Here the problem with traditional principles of taxation arises in relation to indirect taxation, VAT and excise duties, including gambling taxes or tariffs. The solutions currently being proposed differ slightly depending on the type of product or service:

- Eliminate, or reduce drastically the exemption thresholds for low-value physical assets and subject them to standard taxation. The main problem is the administrative and management burden. To minimize it while having the information necessary for controlling operations, two ways are possible, alternative or in combination. Compelling the national intermediaries involved in importing the goods to declare the VAT impact and revenue (carriers, postal services, platforms for online sales or financial intermediaries); establish a simplified registration system¹⁹ for exporters, with subsequent tax obligations, associating them simplified billing and faster customs procedures.
- For digital service/goods providers directly to consumers, the possible solution would be similar: simplified registration system (with information regarding applicable rates, exchange rates to be applied, invoices ...), tax charge obligation and withholding mechanisms in financial institutions, primarily by controlling payments via cards.

19 Possibly with some minimum threshold of invoicing.

- To require the registration of operators of online games, with the obligation to withhold and pay taxes.
- Reverse charge mechanisms for resident companies purchasers of services.

Of course, these mechanisms are not perfect and there could be breaches of the registration obligation or attempts to avoid the withholding by the intermediary channels using uncontrolled payment channels. However, it is expected that large companies would prefer avoiding litigation, hurdles to their activity or reputational damage.

Moreover, countries with a decentralized indirect taxation (as well as economic free trade areas) will encounter the same problems internally, although their solution can use the legislative capacity throughout the territory involved, introducing a destination tax with a control mechanism similar to those exposed.

With regard to direct taxation on income, in principle there would be no problem with the traditional taxation standards, if we consider these operations as exports taxed at source. However, if the location of the residence could be manipulated for finding a source country with reduced or zero taxation or if the tax system is configured to asymmetrically favor exports, competition would be compromised, and countries could choose to protect their markets by introducing some type of additional charge (which, in some ways, could be considered a tariff). Of course, this problem has not started to exist with the e-commerce, although the lack of transportation costs and the ease of change of residence has exacerbated it. In this case, the “source” countries, where purchasers are resident, could choose to introduce an additional tax to the indirect taxes, as we said, a kind of tariff, on the gross revenues using administrative mechanisms similar to the already mentioned, but this could cause foreseeable controversies regarding the compliance with treaties and international trade rules.

4.1.2 Goods digitally acquired to a non-resident company but with essential elements for success residing in the market country

In this case, additionally to the problem of indirect taxes collection that we saw in the previous section for low-value imports, we can face the possible violation of the status of Permanent Establishment (and, therefore, income taxation in the country of destination of goods) by leveraging exceptions for preparatory or auxiliary character activities contained in Article 5 (4) of the OECD Model Convention. It could happen, for example, if the activities of the promotion staff located within the jurisdiction of destination of goods are essential to complete the sales or if the work of warehousing and logistics are critical to meet the demands of customers, although formalization is done on-line through the website of a company based abroad.

A possible solution to this problem has been developed by Action 7 of BEPS, proposing changes to the wording of the Conventions that would establish such activities as the basis for the existence of a permanent establishment and thus generating the obligation of taxation in the country where the goods are purchased.

Countries may choose to establish a withholding based on the income taxation of such companies or to equalize the market conditions (“equalization tax”) temporarily, until said subjection is restored,

albeit this second alternative can create difficulties in terms of conventions and trade agreements in force. In both cases, it would be a tax on gross income, whose management and control require: a) in the case of sales to companies, B2B, the withholding obligation by the resident company; b) in the case of sales to individuals, B2C, the implementation of a registration system for exporters and collaboration of local intermediaries (as we saw in the case of VAT).

Of course, in addition, in the case of implementing the permanent establishment, the authorities could face the classic problems arising from BEPS to determine taxable income in that jurisdiction.

In the case of indirect taxes, problems arise only until the moment when their obligation to pay taxes as a resident company becomes effective. Meanwhile, the options are the same as already noted in section 4.1.1 (reverse-charge on B2B and simplified registration/tax charge/withholding mechanism in B2C).

4.1.3. Provision of new digital services: computing or cloud storage; acquisition of 3-D printing licenses

In this case, the problem lies in the characterization of income derived from these new services, because it is essential²⁰ to establish whether they are considered royalties or payments for technical assistance - both taxed in certain agreements- or corporate profits, in which case they would be taxed only if linked to a permanent establishment.

Possible alternatives to their taxation on income, therefore, lie in negotiating the legal categorization of services for the purposes of treaties -which require some degree of international consensus - or developing a new definition of “virtual” permanent establishment. This new definition would result from the consideration of a “significant economic presence” in a market, different from the traditional elements of physical presence (unnecessary, given the nature of these services). It would be related to the volume of its revenues from a certain market, its digital presence in it - local domain, platform or payment methods- and/or the number of local users, the use of their data or “network effects”²¹.

In the case of indirect taxes, again, problems arise only until the moment when the obligation to pay these taxes as a resident company become effective. Meanwhile, the options are the same as already noted in section 4.1.1 (auto-impact on B2B and simplified registration/tax charge/withholding on B2C).

20 Particularly in the case of agreements that include rental of commercial, industrial or scientific equipment on this concept.

21 On this particular return in the following, address new business models based on the profitability of the data provided by users resident in the source country.

4.2. Models of digital business for non-resident companies making profits from local users' data

In this section, we refer to new digital business models, without physical presence in the market, and that are distinguished from traditional direct purchase of goods and services to individual customers, because they monetize information from the users of their services through parallel business marketing/advertising and collecting brokerage commissions (collaborative, sharing, gig economy).

4.2.1. Indirect profitability by marketing/advertising of data from users of free services

In this case, the non-resident company offers free services of information storage, search, social networking and digital communication and uses the users' data to charge other companies operating in the market for their customer service approach (market research, selection of potential consumers, advertising). This an activity which, as we have seen in section two, has acquired a very important dimension.

The main differentiator is that without the local users' data, the offer of these services would be impossible, which could justify, despite the absence of residence or physical presence in that market, their subjection to income taxation. To do this, it would be necessary to define -as above mentioned- a concept of "virtual" permanent establishment resulting from the consideration of a "significant economic presence" that could be translatable to the conventions. From here, the problems and solution options are the same as those we saw in section 4.1.2 for the cases of modification of the permanent establishment rule, withholding based on income taxation of these companies or taxation to level the market conditions ("equalization levy"). In addition, management and control mechanisms based on the withholding obligation by the resident enterprise (B2B) or registration systems for exporters and collaboration of the local intermediaries (B2C). Again, additionally, the authorities could face the classic problems arising from the different types of BEPS to determine the income subject to taxation in that jurisdiction, increased in this case by the difficulty of establishing in terms of arm's length the contribution to the creation of value via software applications and data analysis.

In the case of indirect taxes, again, problems arise until the moment when their obligation to pay taxes as a resident company becomes effective. Meanwhile, the options are the same as already noted in section 4.1.1 (auto-impact on B2B and simplified registration / tax charge / retention for B2C).

4.2.2. Collaborative Economics

When the non-resident company offers services that allow local users to exchange goods or services, charging a commission, problems may arise regarding taxation on the income of such companies, on the income of users and on consumption taxation, among other areas.

Regarding the taxation of income earned by the company and indirect taxes associated with its services many of the problems and possible solutions are the same as those we have just seen in

the previous section. The main difference arises as to the activities of the users of these services, which would be subject to all taxes²² - and regulation- in force in each of the jurisdictions in accordance with their own rules. In addition, problems arise to access to that information, control (and facilitate) compliance and, in some business models, determine the nature of the relationship between individuals involved in the activity and the company that provides the digital platform. There is very diverse casuistry here, depending on national legislation and the type of mediation made by the company.

Regarding the access to the information, the best option is to have the platform providing it to the local tax authorities²³, a collaboration that may be of interest primarily to large companies, considering the operational and reputational risk that confronting the local authorities may entail. To improve the control and incentives for voluntary compliance would also be closely linked to access to this information and collaboration of the platforms to promote compliance. The introduction of an automatic mechanism of withholding direct and indirect taxes by platforms should be the main objective. In any case, especially for individuals whose participation in these platforms is casual and with a threshold of low performance, a simplification of their taxation²⁴ could be considered, preventing a large number of people from entering a system more typical of entrepreneurs or self-employed professionals.

The determination of the legal effect (and tax effects) of the nature of relations between the platforms and their users is especially complex when these might involve an employment relationship between them, with obligations of collecting social contributions and regulation of working conditions.

4.3. Cryptocurrencies and ICOS (Initial Coin Offerings)

The main problems with virtual currencies and Initial Coin Offerings (ICOs) are derived from how to establish characterization or equivalence to other assets whose taxation is already determined, and how to access the information needed to control it.

As for the characterization, an important difference for tax purposes is whether they are considered equivalent to other currencies or considered a financial asset. This is because the gains/losses generated at the time of their change for other virtual currencies or currencies, or when they are used to purchase goods and services may have a different treatment in the rate or timing of taxation on revenues. Overall, the trend seems not to consider them as currency for tax purposes, but as a financial asset. In addition, ownership of the cryptocurrencies may be subject to taxation on ownership or transfer of assets, if any of these taxes are in force in the jurisdiction of residence of the owner.

The fact that they tend to be considered as an asset distinct from other currencies does not exclude that in general, the purchases of goods and services will be subject to the relevant indirect taxes.

22 Personal income taxes, local taxes, taxation of sales between individuals, social contributions, insurance, etc.

23 There are other options for tracking operations through tenders published on the Internet, inspections or crosses data, however, their efficiency is much lower and higher administrative costs.

24 An optional simplified income tax regime- on gross income, to avoid high costs of compliance and control.

A potential problem in this area (as in case there are reporting obligations on the property based abroad) is to determine the geographical location, since they are an intangible asset. In this case, the choice should be based more on the ultimate goals of tax obligations than in a technical disquisition on the location.

Moreover, it is common that the activity of intermediaries in negotiating cryptocurrencies is considered a taxable economic activity, although it can be interpreted that this is a financial activity for VAT purposes (generally VAT-free and therefore without the possibility of repercussions or deduction). As for the activity of “mining”, its theoretical taxation should be equivalent to that of other personal economic activities in the income tax, although for VAT purposes, it is improbable to tax it since it is not possible to determine a recipient of the services rendered.

The issues associated with the categorization of cryptocurrencies, very complex by their essence, increase with the difficulty to access information on ownership information, exchanges and valuation. The main points of access to information are those linking the exchange of virtual currencies to traditional financial instruments or goods and services with companies subject to taxation. Overall, the collaboration of intermediary companies is essential to access the information.

As for the ICOs, they are a tool for companies to raise capital, and depending on their configuration can be consider similar to very different operations, with different taxation. In general, three types of ICOs could be identified depending on the characteristics of coupons or tokens issued in exchange for such funding:

- Utility Tokens grant a right of use (or off payment for use) the services of the company. In principle, the treatment would be as any consideration paid for services escalated in time, which usually is imputed as income of the company for tax purposes only when accessing the service. The payment of indirect taxes for these services also would shift to the time of using the tokens and would depend on the taxation of the services or goods purchased.
- Asset-Investment Tokens: in this case, the coupons are assimilated to shares, bonds or derivatives linked to company profits. Therefore, they do not fall within the scope of corporate income tax or VAT Companies. However, their profitability or capital gains by itself constitute personal income taxable at the investor level.
- Payment-Currency Tokens are considered as emission of cryptocurrencies, and net profits would be subject to corporate income tax and exempt of VAT. Later, users and intermediaries would have a tax regime as already stated above, for all kinds of cryptocurrencies.

In cases where issued tokens may have a priori mixed characteristics or secondary markets that could alter their original nature (for example, converting a traded consumer coupon into an investment coupon), we should consider their effective use rather than their denomination to determine the taxation.

Table 4

Options for the adaptation taxation to the digital environment			
Business models	Corporate income	VAT	Individuals
1. Electronic cross-border commerce of goods and services			
1.1. Goods and services digitally purchased from a non-resident company and sent-whether digitally or not- directly to individual consumers	Possible reaction to exemption of taxes at source. Trade relations problems.	Eliminating exemptions for low value goods. Registration systems of non-resident companies. Withholding of intermediaries. Reverse-charge on B2B.	
1.2. Goods digitally acquired to a non-resident company but with essential elements for success residing in the country market	BEPS 7: adjust treaties to consider a PE. Withholding tax or equalization levy. Registration mechanism. Withholding by intermediaries.	Registration systems of non-resident companies. Withholding by intermediaries. Reverse-charge on B2B.	
1.3. Provision of new digital services: computing or cloud storage; acquisition of licenses for 3-D printing	Characterization as income for purposes of treaties (royalties, technical assistance) or PE "virtual" for "significant economic presence"	See 1.2.	
2. Digital business models by non-resident companies exploiting data from local users			
2.1. Indirect profitability -marketing/ advertising- using data of free services users	Virtual PE. Withholding tax or equalization levy. Registration mechanism. Withholding by intermediaries.	See 1.2.	
2.2. Collaborative Economy	See 2.1.	See 1.2.	Collaboration with platforms. Internet tracking, data crossing, inspections. Clarifying legal labor relations
3. Cryptocurrencies and ICOS (Initial Coin Offerings)			
	Taxation on emission of cryptocurrencies and sales of utility-tokens	Sales tax	Taxing capital gains as an asset and mining as an economic activity. Property tax. Reporting obligations.

5 Final remarks

As we said in the introduction, the aim of this working document is to provide a synthetic and pragmatic approach to the economic dimension of the digital challenge in the field of taxation -with emphasis on its administration- and the possible options for responding to this challenge. To address them, and offer possible solutions in this area, much work is still needed in terms of theoretical reflection, negotiation and international attention to the particular country initiatives.

This last point, the evolution of the measures already being taken in countries or economic areas, will be critical to assess their chances of success in effects of tax administration, although still many measures, summarized in reference publications by the OECD, the European Union and other institutions are still on the implementation stage and their description exceeds the objectives and scope of this publication.

In addition, we must pay attention to other problems arising from the new digital challenges in the field of taxation: the difficulties in drafting legislation arising from the lack of standardization of concepts, confusion between different business models or interference between the classic problems of taxation and international tax competition with the new challenges arising strictly from the digitalization.

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