

Taxing the Digital Economy

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INTRODUCTION

Technology is being harnessed to redefine traditional business models and provide new ways for buyers and sellers to interact both locally and globally. The result has been the emergence of a handful of firms—the so-called tech giants—that are capitalizing on first mover advantages and network externalities to boost profitability, capture market share, and turn themselves into the world’s most highly valued companies. They have inevitably captured the attention of policymakers, and in the realm of international taxation, the debate has coalesced around a number of issues that are driving the debate over whether and how countries should be able to tax the returns to highly digitalized multinational businesses (IMF 2014, 2019). More generally, an increasing number of firms are digitalizing, leading to several issues that raise or intensify challenges for the international tax system.

The first issue relates to the increasingly sophisticated information and communications technology systems—including the internet—that have facilitated a surge in remote cross-jurisdictional sales, decoupling economic and physical presence. Moreover, with this ability to market and sell goods and services remotely, online retailers are also challenging and displacing traditional physical stores (of all sizes). For example, in the United States, the share of e-commerce in retail sales has tripled to almost 10 percent compared to a decade ago. This has strained the traditional concept of permanent establishment, which relies on a fixed physical presence as a precondition for governments to exercise their right to tax.

The second issue is that intangible assets have a greater role than ever before, with modern multinational enterprises deriving a larger share of their value from intellectual property that is both easy to shift across borders and hard to value for transfer pricing purposes due to lack of comparables. This has frustrated the arm’s length principle and exacerbated opportunities for profit shifting.

A third issue—and an important focus of this chapter—is that the online customer or user is now considered by many as being a critical driving force behind the value of digital services. Digitalization has allowed businesses to harvest data and information about their users at an unprecedented scale. Users provide data on their preferences, be it through their online search,

purchase of goods and services, or through their interactions with others over social media platforms. However, user participation is not recognized under the existing international tax framework as a source of taxable value. As a result, the blurred line between their role in both supply (production) and demand (sales) has—for better or for worse—opened the door to an important conversation about the concepts of source, destination, taxable presence, and profit attribution.

Seeing the largest digitalized businesses paying minimal tax in the jurisdictions where they provide services, policymakers are raising questions about the adequacy of the current tax system in both generating a sufficient level of taxation from such highly digitalized businesses and appropriately distributing that taxation across countries.¹ Resolving these issues is now becoming increasingly important as almost all businesses are steadily moving toward what might be termed a digital asymptote.

A number of policy proposals have been put forward which seek to limit the scope of tax avoidance and tax competition, by attempting to pre-determine a distribution of taxable profits across countries. Many are predicated—implicitly or explicitly—on the idea that the user has a role to play in value creation, justifying the designation of source-based taxing rights to the jurisdiction in which they are located (see, for example, European Commission 2018; HM Treasury 2017). Most prominent among these are the proposals for pure formulary apportionment, or a hybrid residual profit allocation alternative, both of which include some measure of user value as an allocation key. Another related proposal is the allocation of profit to market jurisdictions based on marketing intangibles, also justified by the notion that soliciting the sustained engagement and active participation of users is a critical component of value creation. In the interim, a number of countries have begun to implement user-based turnover taxes, targeting specific digitalized industries and activities.

Many of these proposals have tended to restrict the scope of special tax treatment, singling out particular activities or business models that are seen as particularly data intensive. Yet, as noted in IMF (2019), the collection and use of potentially monetizable information is so pervasive in today's economy that drawing a line between cases in which users are and are not material contributors is inevitably fraught. It would seem that if user data is indeed being exploited at a scale large and wide enough for it to be both recognized as an economic input to production and protected on behalf of the user, it should be recognized for all businesses.

This chapter attempts to understand more comprehensively the role that user-generated value can or should play in determining the structure of the future corporate tax system. It starts by setting out the contentious issue of the role of the user in digitalized business models, and then explores the way in which

¹ For example, see the Institute on Taxation and Economic Policy (ITEP) report: <https://itep.org/amazon-in-its-prime-doubles-profits-pays-0-in-federal-income-taxes/>.

recognition of the user as a source of profits might alter the allocation of taxing rights and the apportionment of profits, respectively. The chapter then turns to a discussion of alternative instruments for taxing the returns to user participation, drawing on lessons from the taxation of location-specific rents in the extractive industries, before concluding.

UNDERSTANDING USER-GENERATED VALUE

In this section, the focus is on the exchange between users and a digitalized business, and the question of whether the former generate “value” for the latter.

The internet—including the decreasing fixed costs of accessing it—and increasing global connectivity have provided the opportunity for e-commerce transactions to grow substantially, vastly increasing the potential number of users and the scale and scope of their digital activities.

Users are claimed to create value in two ways. The first is the provision—or allowing for the collection—of personal data and the creation of digital content, which can then be monetized by the business. The increasing digitization of everyday activities means that individuals produce trails of information almost continuously as they consume goods and services. The data being generated and harvested from these users is not only vast but also an integral part of the business models of the most highly digitalized businesses, allowing the services offered to be better refined for new and existing users. The second is the role that users play in building a network, which is also critical to the viability of many of these digital business models.

The User

The user of the good or service is typically identified as the buyer or consumer of a good or service, regardless of whether the transaction takes place physically (in person) or virtually (online). Below are some specific examples of how users interact with digitalized businesses (and one another) to help clarify the types of individuals we are considering in this paper:

- A user can purchase a good or service online. In doing so, the user also reveals information about their preferences, which are recorded by the business for future use and monetization.² During this transaction the user is exchanging not only a financial payment for the underlying good or service, but also data about themselves in exchange for the use of the online marketplace. Where a third-party digitalized platform intermediates transactions between a buyer and a seller (two-sided markets), both parties are considered users of the service.

² While the value of business-to-business e-commerce transactions is larger, business-to-consumer e-commerce transactions are the primary focus in the current debate.

- A user can browse the internet using a “free” search engine service or mobile application, without ever financially transacting. In this case, the user is sharing and revealing information about themselves and their interests as they do so, in exchange for accessing search (and match) services.
- A user can interact with other individuals over social media platforms. They can post information and generate digital content (for example, educational material, experiences, photos, videos, views about and reactions to events), or promote certain goods and services in the role of social influencer. In doing so, again the user is revealing information about themselves as they use the platform, trading it in return for the ability to interact with their community.
- A user can operate a device that is connected to the internet and through which the manufacturer collects data on its users. This is increasingly common with the internet of things—the networking of everyday physical objects or “things” embedded with sensors to send and receive data (for example, thermostats, vacuum cleaners, toothbrushes, and cars).

The more exchanges that take place, the greater the flow of data from the user to the business and the larger the information set about the user collected—that is, the stock of data about the user increases. And while previously personal data might have been restricted to discrete facts (such as name, age, income, address, health, and education history) in a computer database, the data collected by digital service providers consists of vast real-time flows of unstructured information on individuals’ web browsing activity and use of web applications.

Common to all of these interactions is the so-called digital barter: users exchange—knowingly or otherwise—data on their preferences and activity, which can then be used and monetized by the business for a free or underpriced digital service. While recent highly publicized data breaches have raised awareness about the corporate practice of personal data collection and trading, it seems fair to say that a large majority of users have been unaware of the extent to which they are passively generating personal data that is being harvested and monetized. When signing up for a service, users typically consent—without fully realizing—to this monitoring of their digital activity, with little or no option to maintain privacy. Some companies are even able to follow a user’s activity when they are no longer using their platform, through the use of tracking cookies. Similarly, a number of web applications have access to a user’s location even when they are not actively using the application. In these cases, data is observed by the business and collection is carried out with the user’s formal consent—for example, by accepting terms of service—but without their direct involvement, active transmission, or complete understanding.

Some observers distinguish between this type of passive data generation, provided unconsciously while consuming digital services, and active user contributions on social media platforms. In the case of passive data collection, where the user’s role is limited to their prior consent, it has been argued that it is the business and not the user who really “produces” the raw input data (Becker and

Englich 2019). As such, mere acquiescence to being observed should not be deemed as cocreation of value by users. These observers argue that only when user data is actively solicited or provided—for instance, in the form of survey or complaint—should users be regarded as creating value.³ However, in practice, the line between active and passive data provision is not only difficult to draw, but more importantly is irrelevant as long as both types of data have value and can be monetized.

User Data

Once collected, this data is used by the companies in a number of different ways. For example,

- Businesses can use the data to refine existing products and services or develop new ones, similar to the way in which customer focus groups are used.⁴ Large consumer data sets are now also being used for the development of data-intensive machine learning and artificial intelligence technology.
- Companies can analyze data to discern behavioral trends and preferences for marketing purposes—for example, to create more targeted advertisements, either for their own products and services or to provide advertising services to third parties.
- Data can be used by digital platforms to customize and improve search and matching functions. An example of the former are recommendation engines, which suggest goods and services a user might enjoy based on matching their preferences with those of other users deemed similar.
- Data can be sold in its raw or processed form to other businesses, which can then refine it further for use or sell it on again. An industry of data mining and brokerage firms has emerged that specializes in the collection and sale of consumer data sets. These companies harvest data using multiple access points across a range of internet-based activities and then package it for sale to retailers and advertisers.⁵

Given the different ways that digitalized businesses can benefit from user data, they have often invested heavily in honing techniques to collect and analyze it. As

³ Other examples of valuable user contributions include those that (1) are only temporary in nature, such as product and service feedback that eventually expires; (2) are already compensated, such as paid social media influencers; or (3) deliberately eschew remuneration to (altruistically) improve noncommercialized goods, such as pro bono open source collaboration.

⁴ On some platforms, users are unwittingly even training business algorithms (for example, to recognize faces, by observing how users tag photos on social media platforms, and to identify traffic patterns and optimal routes by tracking driver movements on navigation applications).

⁵ The industry includes not only the large technology companies but also entities such as credit rating agencies (for example, Experian) and data analytics firms (for example, Axiom and Oracle). In cases where data is mined and gathered by such firms, rather than via the provision of digital services, users are left uncompensated and unaware of the use of their personal data. Regulations around such web scraping or mining are only now emerging.

such, consumer data has now become a strategic asset for most retail businesses, many of which rely on data acquired to maintain a competitive advantage by way of knowledge-based product improvements or services.

While the collection of personal data by companies has raised a number of issues around the right to data privacy and the appropriate use of such data, at the heart of taxation debate, and the focus of this chapter, is the issue of compensation for the use of this commercially valuable data. Given the information asymmetry between the user and the company with respect to data collection and use, as well as the lack of options to maintain privacy, is it clear that the user is currently being adequately compensated for their data in the digital barter? And if they are not, should they be remunerated directly, and then taxed under the personal income tax schedule with that remuneration deducted at corporate level? Or should the government tax a portion of the profits of digitalized businesses on their behalf? In other words, should user-generated value establish source-based taxing rights for the country in which the users reside? And if so, how would such a system operate?

A number of observers have proclaimed data to be the “oil” of the twenty-first century (Gupta and others 2017). Indeed, increased data collection and processing capabilities have driven a large amount of new economic activity. And just as natural resource companies explore for and then extract crude oil from designated national deposits using exploration and extraction technology, user data is collected from individuals during the digital barter. In the same way that resource companies process and refine the commodity into various oil-based products for onward sale, data is either traded among brokers or processed to facilitate the provision of revenue-generating data-intensive services. And in both cases, the underlying assets, the users, as with natural resource assets, are immobile, or unique to a particular location, giving rise to the possibility of “location-specific rents” (Cui 2018).

The analogy with natural resources is not exact: unlike information, oil is a rival good. Varian, Farrell, and Shapiro (2005) note that rather than data “ownership,” the more appropriate concept for data is “access,” on the basis that data is not usually “sold” in the manner that private goods are; rather, it is (or at least should be) licensed for specific uses. Given that the resource is never “depleted” in the same way that physical commodities would be, the access to an underlying data pool or asset may be the more appropriate terminology. And while in the resource sectors the scarcity of the nonrenewable resource leads to the generation of large economic rents when extracted, in the case of personal data, the source of large-scale rents, if they arise, are not due to the scarcity of the resource, but rather to the natural monopoly effects described in Aslam and Shah (2020).

Despite these differences, as we will explore further in this chapter, the analogy with natural resources may provide valuable comparative insights for the tax treatment of user-generated data. First, the case for allocating taxing rights over resource rents to the host country is widely accepted, and legal provisions to create such taxing rights are well established. Second, as data becomes increasingly standardized and commoditized, valuation methods for natural resources could

prove useful, as well as the institutional and regulatory frameworks that would be necessary to achieve this. Third, international practice in tax policy toward the extractive industries may provide insights into how best to design a fiscal regime to appropriately tax large potential economic rents from data extraction.

The Value of User Data

Determining the value of user data will be an important ingredient for some of the methods for apportioning and attributing company profits to countries where users are located, which we cover later in the chapter.

Does Data Even Have Any Value?

This determination requires some common acceptance that raw data, before any processing by the company, does in fact have some inherent value. This would seem logical, just as any primary commodity has some value before it is processed and transformed into a final product (for example, crude oil, which has value in its raw form upon extraction).⁶

Many digitalized businesses have, however, claimed that such data is only valuable once it has been analyzed and processed—that is, the real value comes from the intangible assets, such as algorithms and coding, which are used to interpret data and provide the revenue-generating service. The latter reasoning has been used to undermine the assertion that user-generated value can be attributed to users, and to instead claim that all value creation is done at the level of the firm that manipulates the data. While it may be the case that a large portion of the value realized from data is generated in the processing stages, it may equally be argued that without any user data to process there would be no value realized at all.

Moreover, user data is a nonrival but excludable “club” good—similar to other inputs such as “know-how” or “ideas” that feature in endogenous growth models (Romer 1990)—which benefits only those businesses that collect, buy, trade, and process it. The company would not be incentivized to collect user data—by providing services for free—unless there were some value in doing so, and the fact that companies have proprietorship over the data they collect on their users is one facet that allows companies to secure market power and extract rents. If all user data was to be made publicly available, the value derived from the excludability property would disappear.⁷

⁶ Varian (2019) describes a data pyramid to depict the relationship among data, information, and knowledge. A system must be designed to first collect the data, and subsequently organize and analyze that data in order to turn it into information that can be understood by humans, the insights from which can be turned into knowledge.

⁷ Businesses could still charge users or governments for collecting, storing, and processing public data. But companies would have to rely to a far greater extent on their algorithms, intellectual property, and other intangible assets to derive rents from digital interactions with users without ownership and control over user data. It is likely competition would increase then, driving down rents.

Determinants of Data Value

From the perspective of the firm, user data is a very heterogeneous good, and it—and therefore its value—is likely to depend on the type of digital service being provided, as well as the characteristics of the data, such as quality, utility, and the availability of substitutes. Indeed, the value of user data to a firm can be affected by a wide range of variables, including the following:

- The value of user data will depend on its vintage, quality, and sensitivity (for example, data value may change over time in response to security issues, litigation, or legal regulations, which affects how it can be used).
- The value of user data will vary from one individual to another based on their economic profile—for example, their affluence (purchasing power), propensity to spend, and consumption habits—and therefore the extent to which their engagement with a platform can be monetized (HM Treasury 2018). In this way, the average value of data will also vary by country based on the distribution of its users and its economic size, and so on.
- The value of user data can change around key life events, such as marriage or childbearing.
- The value of user data can depend on the intensity of a user's engagement with a service. Some users are much more active and generate significantly larger data volumes than others—increasingly accurate user profiles may make them more or less valuable to a company.
- The more users a business has, the more valuable will be the aggregate data set collected for the purposes of inferring trends and preferences. The value of data is likely to increase more than proportionately with the volume collected; this nonlinearity is driven by network externalities that are discussed later in this chapter. The value of data to a particular firm will also depend on its productivity and the amount of data already in the firm's possession.

As we can see, given that users generate data of differing quantity and quality, valuing data can be complex and highly context dependent. Moreover, since data is not widely traded on markets but often stays within the firm that has produced it, it is hard to value, because its economic usefulness depends on the individual capacity of the acquiring firm to distill relevant information from it using algorithms, aggregation, and other tools, and subsequently to use this information to meet customer needs. Companies can also combine publicly available and proprietary data to create unique data sets for sale or use.

Conversely, from the perspective of the user, how they value their data will depend on the individual's preferences regarding data privacy, as well as the value they place on the service they are trading their data for—both the initial service as well as the customization of that service, which may depend on user activity. Just as for firms, these values will vary by individual, and will depend on the degree of trust in the firm's integrity regarding data usage. For those that value privacy highly, the net benefit of using digital services will be lower. In addition,

the perceived profits accruing to the businesses that harness this data could factor into the user's willingness to engage in the digital barter.

Imputing the Value of Data

Data brokerage business sell information, but little is known about the value of such sales. It is, however, possible to get some idea of the value of user data—much like other intangibles—from past mergers and acquisitions, as well as bankruptcies. Examples include the sale of RadioShack's data in following its 2015 bankruptcy; Microsoft's 2016 acquisition of LinkedIn (\$260 per user), and Facebook's purchases of Instagram in 2012 (\$20 per user) and WhatsApp in 2014 (\$42 per user).

Small-scale efforts have emerged to create a user-centric personal data economy that empowers individuals to retain control over their data and in some cases monetize it themselves (for example, Datacoup and Meeco). The converse approach is the pay-for-privacy model, where consumers pay an additional fee to prevent their data from being collected and mined for advertising purposes (Elvy 2017). Although not yet widely used, these efforts also provide some initial indications of how users value their own personal data.

The issue at hand is how to value a commodity for which there are no market prices or established benchmarks. Open and transparent markets in which standardized units of user data can be traded have failed to develop so far, preventing businesses and governments from quantifying data inputs to production. Institutions, regulations, and transparency are therefore needed to build economy-wide (minimum) rules for benchmark values for different types of data. Then, just as for oil, country-specific adjustments can be made to determine country-specific values for user data.

In the absence of such benchmarks, policymakers might look to more observable proxies of user data value. Some proposals have looked to the final revenues of companies from certain activities. However, unlike natural resources, data is not a physical commodity that can be traced from the point of extraction to a specific point of consumption. Rather, it will likely be blended, processed, and analyzed for use in delivering a wide range of goods and services in a range of different countries. The nonlinear value of data poses an additional challenge in establishing a method to netback from these final revenues to the initial information used as inputs to digital services.

One exception may be the case of advertising, where data is used as an input in determining the placement of person-specific (and, therefore, location-specific) advertisements.⁸ In principle, each advertisement viewed by a particular user has

⁸ Advertising services provided by large multinational enterprises such as Google or Facebook are typically priced using instantaneous sealed-bid auctions, which take place every time someone searches on Google or visits a site that shows AdWords advertisements. Companies can specify the target audience of their advertisement, as well as minimum and maximum bid parameters. Bids are typically based on a cost per click; a cost per viewable impression (that is, number of times an ad shows in a viewable position); or a cost per acquisition (that is, when people take a specific action on a website after clicking the advertisement, such as a purchase or sign-up). Advertising revenues are therefore made up of this variable component, along with fixed minimum payments and service fees.

an associated value, determined by auction according to the willingness to pay by online retailers, and would presumably correlate closely with the relative value of the initial data provided by that user. However, the blending of data from different sources, possibly across different countries, when determining how to best target advertisements would mean that the value of the advertisement is only a proxy for that value of that particular user's data.⁹

More generally, if revenues are used to derive a proxy for user value, what would be necessary, then, is an agreement on the size and scope of netback deductions to determine the value of the initial information used as inputs to these services. In the case of extractive industries, countries often use the net smelter return concept, taking the international market price of the final refined metal product as a benchmark and making deductions for treatment and refining costs to derive the value of the mineral at the point of extraction. We will return to this analogy in more detail later.

User Value from Network Externalities

Beyond the use of personal data in production, the other much-cited source of user-generated value is the role that users play in creating valuable networks for digitalized businesses. The success of digital platforms relies on the interaction between both buyers and sellers, which gives rise to strong complementarities—notably, network and information externalities—where the value in transactions increases for both groups as the numbers on each side increase (Armstrong 2006; Caillaud and Jullien 2003; Ellison and Fudenberg 2003; Evans 2003; Rochet and Tirole 2003; Rysman 2009).

Of course, such network effects have existed well before digitalization (Katz and Shapiro 1985, 1994; Liebowitz and Margolis 1994). For example, the underlying idea of a ride-sharing app is that each individual user adds to the pool of users that make up the network and thereby increases the overall value of the service. This concept applies to a number of both digital and nondigital networks. In a nondigital setting, a farmer's market is more valuable to buyers and sellers if there are more farmers and more shoppers participating. Newspapers and television networks are another widely referenced example where network externalities exist between the market of readers and advertisers. Collier (2018) and Collier and Venables (2018) also highlight how the externalities associated with urban agglomeration produce rents that accrue to a small group of individuals and businesses (the “urban surplus”).¹⁰

Digitalization has exponentially increased both the scale and the speed with which network effects ratchet up. Users posting on social media provide

⁹ It is likely that the advertisement displayed on a user's screen may not be a simple function of their own data but may rather be derived from a large pool of data from other similar users, particularly if a retailer is entering a new market or the user is new to the platform.

¹⁰ Henry George was the original proponent, in 1879, of a tax on the value of land to capture some of the benefits of land appreciation in urban areas.

content that can quickly attract other subscribers, and the more users engage with one another on the platform, the more content they create, and so on (OECD 2018). And the more users there are on the platform, the more the firm will invest in its development. There are also information externalities: users on retail platforms provide feedback through reviews that influence other users of the platform in their consumption choices. While users might be acting in their own interest, their actions both attract other users and continue to reveal more and more commercially valuable information about themselves, creating increasingly valuable opportunities for marketing and product improvement. Other digitalized markets also display such scale effects, such as in the financial services sector (for example, for credit card services) and in the insurance market, where liquidity and heterogeneity of participants is particularly important.

Given the existence of network externalities in both digital and nondigital marketplaces, they would not appear to justify ring-fencing digitalized services and taxing them differently. However, some governments feel that they are a source of rents for the businesses that capture growing user bases. Cui (2018) also notes the location specificity of network effects (both direct and indirect) as the source of location-specific rents. Moreover, the policy implications are unclear. On the one hand, the network externalities highlighted so far also appear to be positive—they generate increasing value for users that are part of the network. From the perspective of optimal taxation, a positive externality in a one-sided market would, in fact, lead to the underprovision of the good or service, so the government should instead subsidize it to increase its production. On the other hand, for two-sided markets, Kind, Köthenbürger and Schjelderup (2008, 2010) show instead that increasing (ad valorem) tax rates—rather than using subsidies—would increase output and improve welfare.

Even if policymakers could rationalize the taxation of rents, the network externalities that generate them can be just as challenging as user data to evaluate. Cui (2018) provides a theoretical description of how user value (encompassing both data provision and network effects) could be measured. Such a method requires measurement of the demand curves for a range of products and services and measurement of the changes in such demand curves upon the introduction of online reviews and customized advertising, from which one can calculate the increase in producer surplus arising from such changes. As we proceed to examine how a system that allows countries to tax user-generated value might operate, we leave aside the notion of user-generated network externalities, and instead focus on value generated from user data.

Taxation or Regulation?

More generally, one might question whether tax is the right tool to address the issue of seemingly excessive rents being generated through network externalities. Markets where these network effects exist without any interoperability between

providers typically tend toward monopoly, in the absence of any intervention.¹¹ As a result, there has been a rapid consolidation of power among certain digitalized businesses—such as internet search and social media firms—which have been able to develop some of the largest user bases thanks to positively reinforcing network effects. Facebook, for example, has over 2 billion users as of 2019, which is about 70 percent of the world’s population that has access to internet.¹² This market concentration has reinforced the ability of only a handful of digital platforms to monopolize the aggregation and analysis of large amounts of personal data.

Indeed, where a market tends to natural monopoly, taxation is not typically the optimal policy response—regulation is typically the first best. The approaches can vary from breaking up monopolies into smaller units (for example, AT&T’s Bell system in 1982) to price regulation. At present, few of the recent wave of digitalized businesses have been subject to any form of antitrust regulation in the United States. The previous notable case was that of Microsoft in 2001, in which it was asserted that the company was using its control over the personal computer market to force out competing operating systems and browsers. Google could be considered a potentially similar case, given its dominance of search and, therefore, advertising services—notably, the European Commission has already fined it for manipulated search results (EUR 2.42 billion in 2017) and for bundling activities (EUR 4.34 billion in 2018).

In the case of Amazon, some have argued that the company has become a utility—given its distribution infrastructure, which is used by many other businesses—and is engaging in anticompetitive actions by pricing below cost to eliminate competitors or force their acquisition by sale (Khan 2017). While this has not triggered reaction thus far, as the impact is admittedly to the benefit of the consumer, this “antitrust paradox” is reducing competition across the retail sector. Price regulation could be a natural response by regulators to such tactics.

What is ultimately important to note is that the economic features of platform-based digitalized businesses can incentivize rapid growth over profits in the short term to secure market dominance (Aslam and Shah 2020). This tends to make anticompetitive behavior, such as predatory pricing and the large-scale acquisition of competitors, a rational strategy. Furthermore, for those sorts of digital platforms where network effects lead to substantial market share through access to user data, and where breaking up companies into smaller (more regional) units does not necessarily solve the problem, price controls—where applicable—are the more efficient tool. Ultimately what works for one type of digitalized business might not be appropriate for others, making a business-by-business (or sector-by-sector) approach necessary. For example, specific regulation bills—akin to the

¹¹ Grinberg (2018) noted that while the fax machine network displayed network effects, the interoperability of fax machines made by different manufacturers and the further interoperability between various telephone providers meant that the network effect did not lead to a monopolistic result.

¹² About 40 percent of the world population has an internet connection today. In 1995, it was less than 1 percent. The number of internet users has increased tenfold from 1999 to 2013. The first billion was reached in 2005, the second billion in 2010, and the third billion in 2014.

US 1996 Telecommunications Act—that govern a wide range of activities, from data collection and privacy to ethical content, might be necessary for those companies that provide certain types of universal services, such as messaging and social media.

As Grinberg (2018) observes, the nature of these markets suggest that tax and regulation need to be appropriately distinguished in the digital economy debate. With ever-increasing market share, rents from monopoly power over information are likely to increase. By resorting to taxation as a means for sharing and redistributing the rents being generated by user-derived network externalities, the question is whether tax policy is being used to treat a symptom, whereas regulation might be more appropriate to address the underlying cause.

THE USER AS THE BASIS FOR THE RIGHT TO TAX AND ALLOCATE PROFITS

As noted, the nature of digital service provision sees the user play a dual role in their exchange with the service provider: the user is a producer of valuable information (while also generating network externalities) and a consumer of digital services. It is the potential difference between the values of these two legs of the exchange that many governments implicitly contest. They see users in their countries being insufficiently compensated for the inputs they supply in return for a service that has a marginal near-zero cost to provide (Aslam and Shah 2020). The uncompensated value accrues to the firm exploiting the information, boosting their rents, which on most occasions lies beyond the legal reach of the government.

In order to remedy the inadequate compensation of users for valuable inputs, some governments claim that the location of users—that is, where they consume digital services and thus where the valuable data input is generated—should confer both the right to tax and a share of profits. Indeed, one of the hallmarks of digitalization is the decoupling of market (or user) presence and the physical presence of companies. As such, existing nexus and profit allocation rules are ineffective should countries wish to exert taxing rights under the source principle.

If we accept the premise that users contribute value, the first step is to establish a legal basis for taxation in the countries in which users are located. One related question is whether “user countries” should have supply-side source-based rights—with users as factors of production—or demand-side destination-based rights. The second step is to determine how users can be part of any profit allocation strategy. In other words, establishing taxing rights is a necessary but not sufficient condition for allocating profits. These are the issues and questions we turn to in this section.

Designating Taxing Rights

The Production and Ownership of User Data

Establishing a right to tax the income derived from user-generated value relies on carefully disentangling the relationships between the user, the digitalized business, and the data being traded between them. Typically, under rights conferred

through national legislation, and by contractual agreement, the owner of any factor of production is directly remunerated by the business for its use, and that income is then subject to tax in the jurisdiction in which the factor is located. However, with largely undefined property rights over personal data, and in the absence of legislation governing the collection of or access to data, ownership over the user data is implicitly vested in the companies that collect it, with no legal obligation to compensate the individuals that have generated this data—beyond the digital service for which this data may have been exchanged. Many companies also feel justified in owning the data as it is their intellectual know-how and technology that enabled its collection, storage, and processing in the first instance. Furthermore, nonrival user data can be used repeatedly by the business and even sold to other businesses, which means that without any rights or control, users are unable to extract the full return on their data.

Ultimately, there is a dilemma over who should have ownership or control over user data, either explicitly through legal property rights or implicitly through compensation for its use. Does the data belong to the user or the firm that collected it? Should user data be owned by the government on behalf of its citizens? If these issues can be defined more clearly, it might then be possible to determine the basis on which the user (or government) can be compensated. Recent reforms have gone in this direction, with greater attention paid to regulating the privacy of and control over personal data, the stringency of which has implications for both ownership and value, and, therefore, the possibility for compensation of users.¹³

If we take the view that the underlying subject of the data, the user, is entitled to compensation for its use, then the nature of such compensation will depend on the ownership or control of the data once it has been collected. If the data is owned by the company, then the relationship between user and business could be analogous to that of an employee and employer, where the former has been actively engaged by the latter and whose time and inputs should be contracted and compensated, but who do not own their work product—in this case, user data.¹⁴ The level of compensation could in this case reflect the present value of the data, which may, of course, be used repeatedly by the firm over time. Alternatively, if the ownership or control over data remains with the user, then there would need to be mechanisms in place to allow businesses to access and remunerate users accordingly, perhaps either on a per-use basis or over a certain time period. From a taxation perspective, if the user is compensated directly for primary collection or sale of their data, this remuneration would be deducted at the corporate level, and the user would simply be taxed under the personal income tax schedule—in a manner similar to a self-employed business that declares its earned income.

¹³ New data privacy requirements (for example, the EU's General Data Protection Regulation 2016/679) apply to a wide range of companies and activities, including search engine, social media, online retailers.

¹⁴ There are numerous practical, legal, and administrative issues with treating users—both regular and casual, numbering for many digitalized businesses in the millions—as employees, leaving this notion as a loose but instructive analogy at best.

A related issue is whether users should be individually compensated or whether the government should be compensated on their behalf. Indeed, the nonstandard and person-specific nature of data—together with the ability of individuals to move location, change nationality, and so on—might suggest that individuals should directly be compensated for access to or collection of their data. Unlike a subsurface natural resource that is generally acknowledged to be a collective national asset (though not in the United States, where subsurface rights belong to the landowner), it could be argued that user data is an inherently personal asset that lends itself more readily to the notion of individual sovereignty.

However, for individuals to be able to exercise and enforce these rights requires not only a strong legal system, but also additional shifts in technology. For example, for users to have full ownership and control over their data, they would need to be able to take it with them between digital platforms, retrieving and sharing their data as they move from one digital service provider to another, or at least monitoring its use. Therefore, the nature of system and software interoperability and data portability would need to evolve.

Moreover, the nature of the exchange of user data for digital services might raise practical questions regarding the feasibility of compensating each user for their data or access to the data. As noted earlier, digital barterers are not large, infrequent transactions between businesses but instead are small, high-frequency microtransactions between businesses and consumers across multiple separate online platforms. For example, social media platforms and search engines record billions of “likes” and queries each day, and trillions of queries every year. The value of the data being traded in these microbarterers is likely to vary significantly, and the current lack of a transparent market or an agreed standardized measure for the value of such data further exacerbates the difficulty in determining and reporting a verifiable person-specific financial value for each exchange.

A more practicable alternative might be achieved if custody over citizens’ data were assigned to the government as a proxy. For example, in the case of natural resources, governments typically hold the resources in trust on behalf of their citizens and collect payment for extraction in the form of government revenues. In the case of digital services, data on the behavior and preferences of a country’s citizens would be seen as a collective national asset with compensation for its use payable to the government. Indeed, a government is better placed to exert collective power on behalf of individuals who cannot capture their rents by levying a tariff (for example, an export tax) on the extraction of data by foreign digital service providers (Hufbauer and Lu, 2018; IMF, 2019). This arrangement would apply whether data ownership is transferred to the company upon collection or retained by the government, although the arrangement chosen (that is, time-bound access or indefinite ownership) would have implications for the level of compensation. And indeed, while user data is intrinsically tied to an individual, the nature of data collection, and the fact that the nonlinearly increasing value from user data is often derived not only from aggregating data related to a large number of individuals but also from multiple points in time, suggests the practical need to centralize ownership so as to coordinate access and compensation.

If such an arrangement were developed, companies that wish to collect user information would then need to compensate the jurisdiction in which the information was collected in accordance with agreed rules, through the corporate income tax system or through other tax instruments, such as a payment of a royalty. Such an arrangement still does not obviate the need for clear valuation rules around the data collected but does allow for the possibility of using country-level proxies or formulary methods for determining user value, which will be explored further in this section.

Reappraising the Permanent Establishment Concept

For governments to have the right to tax the returns associated with user data through the corporate income tax system, there needs to be an explicit basis on which to recognize the economic activity of data collection in the local jurisdiction. As noted in Chapter 3, the traditional basis for a government exerting income taxing rights over a foreign multinational enterprise doing business and deriving profits from their activity in their jurisdiction is the presence of a “permanent establishment.” The following discussion considers how this concept might be amended to facilitate source-based taxing rights over value generated from user data (see Chapter 11 for a more general examination of the concept).

The collection of data from users—regardless of whether it is in exchange for a digital service or not—is typically conducted remotely by the business without any physical presence in the country of the user and therefore does not create a permanent establishment under current definitions. Even when online retailers operate storage and distribution centers in market jurisdictions, these are typically exempted in treaty definitions of permanent establishment (OECD 2017b, Article 5, para. 4). Local affiliates are also commonly structured to have no ownership interest in intangible assets, perform no development, enhancement, maintenance, protection, and exploitation functions, and do not assume any risks. Accordingly, only a modest return may be allocated to these limited-risk distributors.

While activities such as local data collection or warehousing were previously considered to be of a merely auxiliary nature—typically contributing only marginally to business profits and therefore neglected for the purposes of profit allocation or justifying only low profit attributions—they now form core elements of digitalized business models. In other words, previously simple routine functions for which it was generally acceptable to allocate only a small share of the overall business profits have arguably become key activities for many firms, with a pivotal role for data analytics.

However, this surge in cross-border business-to-consumer sales as a result of digitalization has taken us into a gray area. Traditional exporters of goods and services have never been subject to permanent establishment for tax purposes in importing countries. This could be due to the fact that the majority of exports were typically from business to business, especially in the case of intermediate goods. However, the scale of growth of peer-to-peer exports, as well as exports of

retail and intermediation services by highly-digitalized businesses is straining the traditional permanent establishment concept. As businesses increasingly digitalize, the user in the importing country generates valuable inputs for an increasing number of exporters. By ignoring these issues, a consequence of a tax system that relies on physical presence to assert taxing rights is to create variation in the cost of capital between those businesses exporting to or producing domestically for the same market.

Any solution that calls for a different allocation of profits beyond what the current system enables will need to be supported by new or expanded taxing right. As has also been acknowledged under the OECD's (2019) Pillar One proposal (the "Unified Approach"), the current definition of permanent establishment would need to be modified to establish the right for user jurisdictions to tax multinational enterprises that collect data on their citizens. Until then, a multinational enterprise can sidestep the nexus issue by operating remotely, or establishing local affiliates that are not entitled to an appropriate share of the group's profit.

Many have already put forward ways to modify the permanent establishment concept. For example, online retailers, warehouses, and distribution networks developed to cater to users (buyers and sellers) were previously excluded from the definition of the permanent establishment in the existing version of the OECD Model Treaty (OECD 2017b). However, Action 7 of the OECD/G20 Base Erosion and Profit Shifting (BEPS) Project and Article 12 of the Multilateral Instrument provide a basis for an extensive application of the permanent establishment concept to account for the fact that these functions are no longer merely auxiliary but instead form a strategically decisive component of the business model. Some countries have also already taken steps to change the permanent establishment threshold tests in domestic legislation, including India, Israel, Slovakia, and the United Kingdom.

User-Based Approaches

In proposing options to extend the permanent establishment concept to include the location of the user and their data, a number of approaches focus on characteristics of the market. OECD (2018) sets out options for modifying and expanding the permanent establishment definition to include a range of quantitative and qualitative benchmarks, such as the number of registered users, the number of active users, the amount of revenue earned within a market, the level of expenditure, or the existence of a local domain, a dedicated local digital platform and local payment options. Hongler and Pistone (2015) suggest establishing a new permanent establishment nexus by appealing to the idea that users enhance the value of digital services.

Recent legislative developments have also provided glimpses into the way that users can qualify as a form of nexus. In the landmark *South Dakota vs. Wayfair, Inc.* case, the United States Supreme Court ruled in June 2018 that physical presence should not be required for a state to compel out-of-state sellers to collect

state sales tax on sales to customers in a state, thereby overturning its own precedent dating back to 1992.¹⁵ In other words, a company can now be obliged to collect sales tax from the consumer for the jurisdiction in which that consumer is located, even if the seller has no physical presence there.

Specifically, the wording of the majority opinion noted that “a business may be present in a State in a meaningful way without that presence being physical in the traditional sense of the term.” The opinion goes on to say that “[i]t is not clear why a single employee or a single warehouse should create a substantial nexus while ‘physical’ aspects of pervasive modern technology should not. For example, a company with a website accessible in South Dakota may be said to have a physical presence in the State via the customers’ computers. A website may leave cookies saved to the customers’ hard-drives, or customers may download the company’s app on to their phones. Or a company may lease data storage that is permanently, or even occasionally, located in South Dakota.”¹⁶

The idea that virtual access to a catalogue of people (for example, Facebook); products (for example, Amazon or eBay); services (for example, Airbnb or Uber); or other websites (for example, Google) could be equivalent to an individual visiting a physical shop—in this case corresponding to social clubs, department stores, letting agents and taxi services, or public libraries—and browsing these items in person is a powerful notion. The devices that provide users with mobile market access and the opportunity to browse goods and services from any location—computers or mobile phones—could therefore form the basis for location-specific permanent establishment based on the location where the user is when they use a service. In a number of countries, servers already give rise to a permanent establishment even if the business has no other presence. In February 2012 India’s Authority for Advance Rulings ruled that a foreign company’s server constitutes a permanent establishment for tax purposes, and the profits arising from it are taxable—so including devices would be an extension of that existing concept. This was also later clarified in the commentary to the updated UN and OECD Model Tax Conventions, at least in cases where multinational enterprises own or lease a whole server, although not in cases where they rent a space on another entity’s server (OECD 2017b).

Even before the Supreme Court case, US states had already attempted to use novel interpretations of “physical presence” to establish nexus and impose sales tax collection obligations on out-of-state retailers: the so-called Amazon laws. For example, in September 2017 Massachusetts adopted a “cookie nexus” law, under which out-of-state sellers are deemed to have a physical presence with the state

¹⁵ The ruling is in respect to South Dakota’s law, but has implications for all US states.

¹⁶ In the end, the case upheld the nexus rules of the South Dakota sales tax, that is, on a yearly basis delivering more than \$100,000 of goods and services into the state or engaging in 200 or more separate transactions for the delivery of goods or services into the state. By taking this broader approach to nexus, the Supreme Court sidestepped questions such as whether cookies, apps, and so forth can amount to physical presence, as this would have “embroil[ed] courts in technical and arbitrary disputes about what counts as physical presence.” (South Dakota v. Wayfair, Inc., 585 U.S. ___ (2018)).

simply by placing a cookie on the computer or device of an in-state purchaser.¹⁷ Ohio followed suit with a similar law, under which nexus is presumed to exist when a vendor uses “in-state software” to sell taxable goods or services to local customers. As early as 2008 some states had already enacted so-called click-through nexus statutes, which define nexus to include out-of-state sellers that reward in-state residents who refer potential customers through links on a website.

However, even cookie nexus, while a novel approach, can run into familiar threshold questions as to whether a cookie can be considered a significant physical presence. It can be argued that the electronic data that comprises a cookie is intangible and therefore incapable of creating a physical presence. A cookie, after all, cannot physically be held, weighed, or touched on its own. But the idea of what can be considered tangible is expanding in many contexts.

Investment- or Asset-Based Approaches

Other approaches focus on the company’s investments to access a market and develop its customer base. For example, Schön (2018) contends that if it can be shown that a digitalized business has invested capital in a specific market in order to access a specific customer base, this investment can give rise to taxing rights in the respective market country, not simply because there is a market with customers ordering goods or services, but because the company has invested into that market and expects a return on this investment.

However, to contain the proliferation of small permanent establishments around the world, one would have to introduce a meaningful qualitative and quantitative threshold on that investment, such as singling out specific digital elements of that investment or setting a minimum level of investment to bring forward the right to tax. It would also require carving out the part of the firm’s investment that is of a general nature and the part that is devoted to individual markets. For example, for firms which process user-generated content, like Facebook, Instagram, Snapchat, Twitter, or YouTube, this would require identifying how much has been invested in providing “free” communication services to these customers in order to create market access for the profit-generating advertising business run by these firms. Likewise, Google invests in a local market by providing search functions to local customers, which enables them to sell advertising slots to business clients.

While this approach is fully in line with basic legal and economic assumptions about the corporate income tax, it is clearly not related to the “benefit principle”

¹⁷ The regulation provides that a vendor has physical presence to the extent that (among other requirements) it has “property interests in and/or the use of in-state software (for example, ‘apps’) and ancillary data (for example, ‘cookies’) which are distributed to or stored on the computers or other physical communications devices of a vendor’s in-state customers, and may enable the vendor’s use of such physical devices.” The collection requirement is only imposed to the extent that the vendor’s annual sales total at least \$500,000 or 100 individual transactions (<http://www.mass.gov/dor/businesses/help-and-resources/legal-library/regulations/64h-00-sales-and-use-tax/830-cmr-64h-1-7.html>).

in its classical spatial form. This is because these “country-specific” investments may be targeted at a local customer base, but they are not dependent on any spatial relationship to the market country or any specific public goods provided by the market country. Taxing the returns on these “sunk” investments could be justified in economic terms as far as these profits may typically represent location-specific rents that are immune to erosion by tax competition.

Along the same lines, an alternative proposal for establishing physical presence and allowing market jurisdictions a basis for claiming more taxable income—albeit only to a limited extent—focuses on “marketing intangibles.” These are broadly defined assets that can include brands, goodwill, and trademarks, as well as user data (OECD 2017a).¹⁸ Advocates for this option acknowledge that the value of marketing intangibles is linked to the market in which sales to users take place, potentially meaning that the market country is the source of value for the marketing intangible. Once rights have been assigned, a formula would be required to allocate profits to the various newly empowered jurisdictions.

Overall, this proposal aims to prevent unnecessary ring-fencing while also helping to preserve the existing arm’s length principle. However, many companies—notably in the pharmaceuticals industry—contend that by using marketing intangibles to extend taxing rights, a disproportionate share of profits would be moved away from research and development toward populous end markets. Should marketing intangibles form the basis of a new approach, there is a risk that policymakers may limit its application to only those business-to-consumer businesses for which such intangibles are sizeable; that is, certain types of businesses end up being targeted and ring-fenced.

Moreover, distinguishing marketing intangibles from other types of intellectual property is a difficult exercise. Just as with user data, the subjectivity of the value of marketing intangibles remains an issue that could lead either to disputes between territories or to an arbitrary formula that is not based on any core principles, meaning it could change at any time as political consensus shifts.

A related proposal has been put forward by Becker and Englisch (2019), who define the concept of a “sustained user relationship” built on the repeated provision of online services over time. This concept can serve as a proxy for the potential to legally collect certain types of data from a user continuously and on a large scale, and to exploit them commercially. This sustained user relationship—defined over some threshold—could be used to establish nexus for the allocation of taxing

¹⁸ A “marketing intangible” is defined in the 2017 *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations* as “an intangible . . . that relates to marketing activities, aids in the commercial exploitation of a product or service and/or has an important promotional value for the product concerned. Depending on the context, marketing intangibles may include, for example, trademarks, trade names, customer lists, customer relationships, and proprietary market and customer data that is used or aids in marketing and selling goods or services to customers.” (OECD 2017a, p.27). In its March 2019 comments to the OECD, Johnson & Johnson proposed a formula for profit attribution, starting with a fixed percentage of global operating profits, and adjusting it based on overall group profitability and business marketing expenditure across countries, subject to a ceiling and floor.

rights. As the authors themselves note, this nexus criterion does not differ markedly from an approach that emphasizes user participation. But for the purpose of profit allocation, the significance of the user relationship and the corresponding access to data could be more helpful for granting permanent establishment rather than assessing the value of uncompensated (user) labor.

Hence, one could treat the sustained user relationship as an intangible asset of the business that maintains it and can rely on it to systematically milk the relevant user data. This intangible also clearly would have a positive monetary value, in the same way previous corporate acquisitions have seen large amounts exchanged for user databases. Yet the valuation of this intangible remains as fraught as valuing the individual data. In this case, certain attributes of the data might be more relevant, such as the quality and strength of a typical relationship over time.

Allocating Profits

Even if the presence of a taxing right were to be agreed and resolved comprehensively, there are still some steps left before profits can be taxed. This includes determining (1) the level of profits attributable to each country, and (2) how profits should be taxed. The second step remains under the sovereign purview of the country once it has secured the right to tax profits. It is likely to consist of the application of the domestic corporate income tax to this new tax base. However, the first issue is more involved and relates back to the measurement of user value and the overall identification of business functions and factors that could determine how profits should be distributed.

Separate Accounting

As noted in Chapter 3, the current system is based on separate accounting, with each part of a multinational enterprise treated as a separate entity, with taxes determined on separately calculated profits, and with transfer prices required to be set under the arm's length principle. Under this current framework, the choices that multinational enterprises make as to how they internally organize themselves across multiple jurisdictions—between branches, holding companies, parent companies, subsidiaries, and so on, have important tax consequences.

Chapter 5 spelled out various difficulties of separate accounting under the arm's length principle, notably the technical difficulties in obtaining prices for hard-to-value goods and services, and the incentive created for profit shifting. The problems are particularly acute for highly digitalized companies. Their transactions involve unique and intangible goods and services, which are genuinely hard to value. And they often earn high rents from these assets, which can be shifted with relative ease to low-tax jurisdictions or tax-favored vehicles, such as intellectual property boxes. In the case of user data collection, using the arm's length principle approach would involve establishing the associated income and costs for the multinational enterprise, as if the collection agency were a separate enterprise. However, as digitalization leads to countries becoming increasingly integrated economically, it is impractical to use a separate accounting system to determine

how much of a multinational enterprise's income is earned by an affiliate in one country and how much by an affiliate in another.

In sum, the application of arm's length principle is not only increasingly difficult but unrealistic as intellectual property and intangibles come to dominate company activity and value. The irony is that multinational enterprises arose precisely to avoid the inefficiencies that arise when unrelated companies must transact with one another at arm's length. The convergence of these frustrations with the existing arm's length principle and the increasingly digitalized economy, which has exacerbated the limitations of the current nexus requirement of a permanent establishment, has intensified the debate surrounding the fair allocation of taxing rights and the need for fundamental reform.

Formulary Apportionment for Highly Digitalized Businesses

An alternative to the separate accounting approach—discussed in detail in Chapter 14—would be to disregard all of these legal distinctions and simply look at a company as a large, single unit and allocate its profits by formula. In this chapter, the focus is not on the general pros and cons of formulary apportionment but rather on the question of whether formulary apportionment could effectively account for value created by digitalized businesses from user data, and if so, what it would look like.

There are a number of strengths of applying a formulary apportionment system to accommodate increasing digitalization:

- As the nature of business changes, the formula can be augmented (or reduced) to account for those factors that are most critical for determining a business's connection to a location—and the base for its tax liability. Formulae often vary by sector, such as in Canada, where special factors and weights apply to insurance, banking, and transportation, and in the United States,¹⁹ where Alaska uses an origin-based sales factor for extractive industries (De Mooij, Liu, and Prihardini 2019).
- Formulary apportionment does not need to apply to all profits. To the extent that certain countries demand that a certain portion of profits must remain within their jurisdiction, apportionment can then be applied to residual profits (see next section). Again, in the case where market countries demand a share of profits given the contributions of their users, profits can be first split, with only a certain fraction available for apportionment using some sort of user-based factor.

The specification of the formula can have important implications for a number of reasons. For example, the inclusion of certain factors, such as assets and employment, creates an implicit tax on them, discouraging their accumulation in high-tax locations. Furthermore, not all of these factors might be relevant for

¹⁹ The United States already uses formulary apportionment domestically to determine the taxable share of US-source corporate profits across states.

gradually digitalizing businesses. Payroll is one such case, which might find itself increasingly irrelevant: given the ability to sell remotely, there can be virtually zero labor presence in certain markets and therefore zero apportionment.

The principle that taxes should be applied “where value is created” fails to provide guidance on relevant factors (Devereux and Vella 2018). As discussed, there are many activities that create value on the demand or supply side. The chosen formula can therefore potentially combine a number of location-specific factors from both sides of the market. If measurable, these could include, for example, the following:

- *From the demand side:* sales, population (total or by age), mobile phone and internet penetration (as a proxy for usage of digital services)
- *From the supply side:* assets (total, tangible, intangible), employees (or payroll), users (volume, value of data they provide)

To the extent that user data is essential to digitalized businesses and can be valued, it can potentially feature in the formula. The latest draft proposal for the EU-wide Common Consolidated Corporate Tax Base includes a fourth data factor that reflects the collection and use of personal data of online platforms and services users.²⁰

One proxy for user value is the volume of users, which can be measured in many ways. For example, a country’s population could represent the potential maximum volume of users in each jurisdiction; alternatively, we could consider volume as that part of the population that has access to mobile telephony and the internet. However, it is unclear that the volume of users would be sufficient.

First, the population of a country is not static—it can change over the course of the year for many reasons. And a country’s user population will include foreigners that are resident in the country as well as its own citizens. In other words, migration flows alter the population of a country throughout the year, especially in the case of seasonal flows from activities such as tourism, which can in many cases swell the numbers in a country at any one time—think small island tourist destinations.

Second, even with accurate statistics that can be used to gauge the flows and stock of users in each country, what will also matter for apportionment is intensity. It is not necessarily the case that each user is equally valuable both within and across countries. In April 2019, India proposed assigning different weights to different categories of digital businesses depending on the level of user intensity—namely, 10 percent to the users for those business models involving low or medium user intensity and 20 percent to those business models involving high user intensity. However, the determination of intensity remains undefined.²¹

²⁰ “Amendment 10 of European Parliament Legislative Resolution of 15 March 2018 on the Proposal for a Council Directive on a Common Consolidated Corporate Tax Base” (EC 2018).

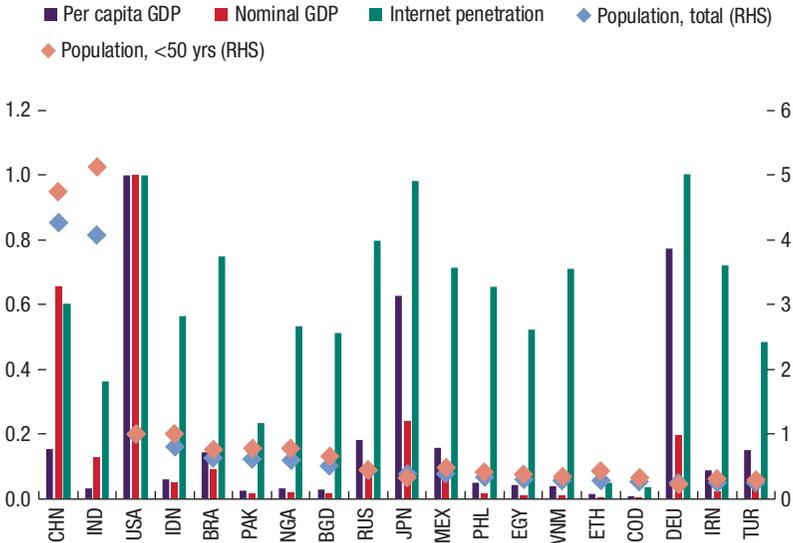
²¹ See India’s Central Board of Direct Taxes, “Public Consultation on the Proposal for Amendment of Rules of Profit Attribution to permanent establishment-reg,” April 18, 2019. (https://www.incometaxindia.gov.in/News/Public_consultation_Notice_18_4_19.pdf).

Moreover, it is not necessarily the case that each user is equally valuable both within and across countries. Certain income and demographic profiles would matter more for some businesses than others. For example, users from countries with higher per capita incomes would be more valuable for retail businesses, which therefore suggests that those economies should have a larger apportionment of profits.

The choice of factors can have important implications for the distribution of profits (see Figure 10.1). Large, populous economies that are both large-source and destination economies, such as the United States and China, would secure a larger share of profits under formulary apportionment with greater sensitivity to users (proxied by the size of the population). However, other destination countries with large markets would also gain substantially, while small-source countries would lose. To the extent that formulary apportionment is applied universally, tradable sectors with global supply chains would be affected disproportionately.

In addition, longer-term demographic trends that mean that the share of the youngest in the population—that is, those that typically use technology and digital services more frequently and intensively—is set to expand in certain parts of

Figure 10.1. Distribution of Alternative (User-Related) Factors for 20 Most Populous Economies
(2018; multiples of USA quantities; USA=1)



Sources: IMF, World Economic Outlook database; International Telecommunications Union; UN Department for Economic and Social Affairs, Population Division; authors' calculations.

Note: Data labels use International Organization for Standardization (ISO) country codes.

RHS = right-hand side.

the world while contracting in others. In this case, user-based factors would imply a gradual reallocation profits to these economies—notably in Africa and Asia—where demand for digital services is likely to be greater.

Residual Profit Allocation

Alternative forms of apportionment have also been proposed that allocate only residual profit by formula (Chapter 14). Such forms require distinguishing between routine and nonroutine returns to investment. The routine return can be calculated in a number of ways: for example, it could be associated with the economic concept of normal profits, calculated as some markup on costs or a fixed return on tangible assets. In doing so, it can also still allow for partial use of the existing arm's length principle approach.

The key notion is that residual profits are those that are harder to attribute to specific jurisdictions, that is, the profits of a business after the activities of service providers have been awarded a normal return. Once calculated, these profits can be allocated using an agreed-upon formula. This allocation of residual profits, while arguably adding a new layer of complexity, eliminates the existing complexity in measuring and valuing intangible assets. While still administratively complex, such a hybrid solution may be more politically palatable and expedient than comprehensive formulary apportionment, as it more closely resembles the current system.

One application of this method in a digital setting—though not part of the current OECD proposal for a unified approach—would be to attribute these profits to the value created by the activities of users, through quantitative or qualitative information, or through a simple percentage. This portion of profits could then be allocated between the jurisdictions in which the business has users, based on another agreed allocation factor, as discussed above.

ALTERNATIVE APPROACHES TO TAXING USER VALUE

We already introduced the analogy between user data and natural resources. In this section, we consider how other revenue-raising instruments could be used to compensate countries for the use of their citizens' personal data, drawing on experiences from the extractive industries. Moreover, we show that under certain conditions, even in the absence of agreement over the approach, the widespread implementation of unilateral user-based tax measures by governments would tend in the limit to the outcome under a user-based apportionment of global profits.

Royalties on User-Generated Value

Taxing User Value: Lessons from the Extractive Industries

The approach to taxation in the extractive sectors has evolved over time, in line with a shifting balance of power between host governments and investors. Hogan and Goldsworthy (2010) note that, prior to World War II, governments typically

granted concessions to investors to explore for and extract natural resources in exchange for a relatively low burden of initial bonuses, royalties, and land rental fees. Decolonization after World War II and establishment of the permanent sovereignty principle²² drove the desire of a number of resource-rich countries to receive a larger share of the resource rents, at which point fiscal regimes began to involve the increased use of state participation, income taxes, ad-valorem royalties, and other revenue instruments.²³

One might conclude that similar trends are emerging with respect to the “extraction” of personal data. With largely undefined property rights and legislation over personal data, its collection and use have gone largely uncompensated, except indirectly through the taxation, if any, of overall returns under the current corporate tax system. However, governments are now exerting greater sovereignty over their citizens’ data, and seeking a “fairer” global distribution of tax revenues, both through the corporate tax system and through the application of new instruments, as will be discussed in this section.

The key objective of extractive industry fiscal regimes is to maximize compensation to host governments, while maintaining the investor’s incentives to undertake exploration and extraction, given their respective risk profiles. While an objectively “fair” division of resource rents remains contentious, international norms have developed over time. Regimes typically comprise a combination of production and profit-based instruments²⁴ to make up a combined “resource charge”, and thus involve an inherent trade-off between the efficiency and neutrality of the regime, as well as the timing and risk associated with revenues.

One could conceive of a similar approach to the taxation of value from user data. The design of any data-specific fiscal regime or resource charge (perhaps an “access charge”, depending on whether the individual or government retains data ownership) must appropriately balance a sufficient return to the investor with the need for a “fair” level of government revenue as compensation for extraction or access to the national data asset. Given the range of companies involved in the

²² The United Nations adopted resolution 1803 (XVII) on the “Permanent Sovereignty over Natural Resources” on 14 December 1962. This resolution provides that States and international organizations shall strictly and conscientiously respect the sovereignty of peoples and nations over their natural wealth and resources in accordance with the Charter of the United Nations and the principles contained in the resolution. These principles are set out in eight articles concerning issues such as the exploration, development and disposition of natural resources, nationalization and expropriation, foreign investment, and the sharing of profits.

²³ In the developing world, a number of contractual schemes were developed in the mid-1960s, such as the production sharing contract, and fee-for-service contracts in the context of fully nationalized industries.

²⁴ Production-based instruments, such as royalties, despite their regressivity, are often used by governments to secure revenues from the outset of production and to protect against profit shifting. And recognizing the larger rents generated by the resource industries, the overall level of taxation in the extractive industries is often higher than for other sectors, with a component of progressivity, through a resource rent tax instrument, to allow the capture of a larger share of rents from more profitable projects.

data economy and the variability in their profitability, a degree of progressivity may be desirable, in order to capture large rents if they arise. It may also be desirable to ensure a minimum charge for all data collection activity regardless of rents, which governments would need to moderate to avoid deterring the development and growth of data-intensive companies—like natural resource companies, a high degree of risk typically characterizes the initial start-up phase, particularly given the high fixed (and sunk) costs incurred for data collection and the development of analytical capabilities.

While there are many possible alternative tax instruments—or combinations of instruments—that can compensate countries for the collection and use of personal data, the focus here will be on the design of a production-based instrument, that is, a royalty on data collection.

Designing a Royalty on User-Generated Value

Royalties are payments that companies must make to governments for permission to engage in certain activities. They are commonly charged for the right to use intellectual property, such as copyrights, patents, and trademarks, and in the extractive industries for the extraction of natural resources, and typically complement corporate income taxes. Royalties are also a useful—if nonetheless imperfect—substitute when direct taxation of rents is difficult, particularly for sectors heavily reliant on hard-to-value assets, where administrative capacity is weak, and where rent taxation is therefore vulnerable to cost-based profit shifting (Boadway and Keen 2015). Furthermore, by relying on revenues, they are simpler to administer than profit-based taxes, reducing the need to monitor costs. Finally, royalties sidestep the practical legal challenges associated with adjusting direct income taxes, since they do not require modification of existing permanent establishment rules or changes to income tax treaties.

Their application as a charge for the use of consumer data is therefore logical if not also somewhat ironic, since intra-company royalties are already used by multinational enterprises themselves to shift profits across jurisdictions. In the natural resource sectors, they have proven attractive to governments on the grounds that they secure some revenues as soon as production begins. Indeed, IMF advice to resource-rich member countries, particularly low-income countries, has been to charge a modest royalty alongside the statutory corporate income tax, with an additional rent-capture mechanism for particularly profitable projects (IMF 2012).

In terms of design, a broadly-applicable royalty is likely to be desirable given the wide range of digitalized businesses collecting personal data. As the range of digital services continues to expand, it is important to prevent the proliferation of multiple royalty rates and bases across countries and activities which can generate both inefficiency and non-neutrality. This will also simplify administration and limit the scope for (purposefully) misclassifying taxable activities. Moreover, as we will show later in this section, under certain simplifying conditions, if all countries apply a consistent approach to determining user-based royalties, this would

be broadly equivalent—in revenue terms—to a system of user-based formulary apportionment of profits.

There are a number of options for the design of the royalty base. A simple *ad valorem* royalty based on the value of the flow of data collected from a country and used by a company in a given year would be the ideal design—this is the most common specification used in the extractives sector. Alternatively, if the firm retains ownership over the data, rather than accessing it on a use basis, countries may wish to tax the stock of data held on a periodic basis, justified by the fact that companies are repeatedly generating value from this data.²⁵ However, both methods require either standardized data valuation methods or the establishment of a spot market for data.

In the absence of clear valuation methods, as long as the volume of data (stock or flow) collected from a country can be measured, a simpler approach would be to charge a specific royalty on this base. This can take the form of a defined volume-based charge on a unit of data collection, such as a pre-specified monetary charge per terabyte. This approach is often used for bulk, low-value minerals such as aggregate and sand. However, it would require some careful design and monitoring by governments to ensure that the tax is periodically adjusted to reflect evolving data compression technologies.

Without valuation methods and volume measurement capabilities, an alternative two-step approximation for user-generated value can be considered. The first step would be to estimate the portion of a company's final revenues from digital services that were generated by a particular country's users. Once these country-specific revenues have been determined, the second step is to allow for a (standardized) netback deduction from these country-specific revenues, to account for value added from post-data collection processing and analysis.²⁶ These steps provide a proxy for the value of a country's user data, which can then serve as the base of the royalty. Indeed, in the extractive industries, countries often simplify valuation by using internationally-quoted benchmark prices for finished minerals, restricting netback costs to those that are easy to measure, or standardizing allowable deductions in contracts or legislation.

The first step requires a method for apportioning a company's user-generated revenues by location to approximate the relative value of the user base in different countries. However, this can be difficult because as discussed before, data is unlike other physical commodities, which can be traced from their point of extraction to their point of use. Moreover, its nonrival nature means that the same portion of data may be blended, processed, and used simultaneously in the production of multiple goods and services—in some cases even many years after it has been collected. The previous section reviewed some of the country characteristics that

²⁵ The stock of user data could also then be reported as a special sub-category of intangible assets on firm's balance sheets in the same way that petroleum and mineral reserves are measured, valued, and "booked".

²⁶ For those businesses which also engage in other "less digital" activities, it would be necessary to determine the portion of overall revenues that are attributable to their digital activities.

can be used to inform such apportionment, for example, population, purchasing power, and sales revenue (in the case of online retailers).

Without coordination amongst countries, there is a risk that revenue attribution methods may vary within and across both countries and the digital services being targeted, introducing the opportunity for multiple (inconsistent) approaches. For example, the apportionment method for advertising revenues may differ from that used for user data sales, online sales of goods, and intermediation revenues. Even within certain activities, different keys could be used by different countries (for example, value-based versus volume-based keys). Further complications might arise from competing claims over the revenues from cross-border transactions and sales of multinational data sets.

For the second step, the netback deduction would serve as an approximation to derive a value for the underlying personal data. This could be defined company-by-company—given different data refinement processes and cost structures—or in legislation at broader (sub)industry levels to ease administration. A case could be made for standardization of this netback across countries, assuming that multinationals are collecting data of similar quality from users worldwide and centralizing their processing operations, implying a common cost structure.

Alongside the royalty base, the choice of the rate is also important. The netback deduction and royalty rate are two sides of the same coin, since a country can calibrate the effective tax burden by adjusting either the netback or the rate of the royalty. In the extractive industries, for example, some countries disregard costs altogether in defining their royalty base, instead valuing output at the benchmark price for its mineral content and lowering the royalty rate to compensate.

Rates should be set at an appropriately modest level, as they are applied to revenues rather than profits.²⁷ Where royalties are charged on a gross—rather than a net—basis, they no longer only tax pure economic rents and can distort the activities they are targeting.²⁸ This is analogous to the disincentive effects of royalties on exploration activity in the extractive industries. Thus, those countries with lower value consumer markets (for example, with fewer active users or lower purchasing power) might set rates lower so as not to disincentivize data extraction by nonresident digitalized businesses or deter market entry altogether.

In setting the rate, policymakers should also be sensitive to the risks of excessive pass-through to consumers. While the location-specific nature of the asset

²⁷ For example, a royalty of 4 percent is the equivalent to 20 percent corporate income tax rate assuming a 20 percent average profit margin across all businesses, but the effective income tax burden increases as the profit margin declines. Using average profit margins means that royalties might be too high for low-profit or loss-making businesses.

²⁸ A tax on pure economic rents does not distort the mix of inputs used in production. At the margin, firms employ factors of production (capital, labor, etc.) until the marginal return on the additional unit equals its marginal cost. In economic terms, rents are zero at the margin, negative if production is too great, and positive if too little. A pure rent-based tax, therefore, neither discourages nor encourages investment or production, as it will not influence production decisions at the margin (Mintz and Chen, 2010).

means that companies cannot themselves relocate to avoid payment of the tax, their relative market power may allow them to pass the tax on to consumers. This is likely much easier than in the resource sectors where for most countries commodity prices in export markets are exogenously determined.

At the same time, this risk should not be overstated. If the marginal cost of providing the taxed service is low, then the royalty acts like a tax on the firm's quasi-rents: rents that are exclusive of costs sunk in establishing the business (IMF, 2019). The primary impact may therefore not be on current pricing but on future investment. However, if the digital service is itself used as a business input, then the royalty may introduce production inefficiencies. This would reduce profitability for businesses and may raise prices for consumers, though the magnitude of such inefficiencies are unclear.

Cui and Hashimzade (2019) show that when the marginal cost is non-zero, the incidence of a tax on platform revenue will fall on both the platform and the advertisers/producers, but the effect on consumers is ambiguous. Moreover, as the authors argue, countries may well view some cost-passthrough to domestic users as a reasonable price to pay for capturing some of the platform rent. However, incidence effects are complex in two-sided markets. Firms may aim to shift some burden to the untaxed side: a tax on advertising creates an incentive to raise the price charged (or reduce the subsidy provided) to users; the price of advertising services may even fall. On tax incidence in two-sided-markets, see Bourreau, Caillaud, and De Nijs (2016) and Kind, Köthenbürger and Schjelderup (2008 and 2010).

Businesses at different points in their life cycle might require different tax treatment. For this reason, a case could be made to introduce thresholds and rates that vary by the size of a business. Safe harbor rules could also be used to protect small or loss-making companies. However, such provisions might quickly become nonbinding even for small, digitalized businesses given the nature of their cost structure (Aslam and Shah 2020). With low (or falling) marginal costs, average variable costs will also be low, allowing small businesses to scale up operations profitably and quickly.²⁹

Royalties are a powerful fiscal instrument with a long history of application in a sector that shares a number of characteristics with data-intensive digitalized business models. However, they should be carefully approached so as not to generate other economic distortions. If royalties are intended as a substitute rather than a complement to the corporate income tax, then a lack of multilateral consensus risks unwanted international double taxation if they are not creditable against corporate income tax payable in home jurisdictions. If applied unilaterally such tax measures may also risk retaliation, especially if these measures end up being de facto targeted on firms from a few countries (Hufbauer and Lu, 2018).

²⁹ Indeed, as noted by Cui (2018), the variable costs of data capture through the operation of a search engine or a social media network and its subsequent storage and maintenance would seem largely negligible.

The Implications of Moving Toward a Royalty on User-Based Revenues

In the absence of multilateral consensus, Box 10.1 explores—in a highly stylized setting—what the noncooperative outcome could be if all countries were to impose user-based royalties on the revenues from digital services. It illustrates that, *ceteris paribus*, countries will be indifferent (in terms of tax revenues)³⁰ between a user-apportioned profit tax and a royalty on user-based revenues, if the ratio of the royalty rate and the profit tax rate applicable to the multinational enterprise is set in proportion to the company's global average profit margin. This result holds irrespective of the global distribution of profits or revenues—and, by implication, the global distribution of costs.

While this is a very simplified result, which abstracts from some important real-world considerations and complexities, we can get a sense that should several countries move to implement such (short-term) royalties on user-based sales, then under the specified condition, the system would gradually come close to a system under which global profits are apportioned by the same user-based sales. This result should be familiar as it is the same logic that is commonly applied for calibrating standard turnover taxes for simplified small business regimes. In these systems, tax rates on turnover are typically set to ensure that the liability for the average small business would be the same as that under the application of the corporate income tax on profits. Just as in the small business setting, a turnover tax calibrated using average profit margins would be too high for low-profit or loss-making digitalized businesses (and vice versa), disincentivizing investment.

As this section has discussed, there are several reasons why policymakers should not preclude the use of a user-based royalty tax instrument as a complementary measure or as part of a globally cooperative approach to tax data-intensive services. Firstly, royalty payments are common between private parties for the right to use intellectual property and other intangible assets, such as copyrights, patents, and trademarks. This sets a natural precedent for governments to charge similar payments for the use of a national (intangible) asset—such as a user data—by digitalized businesses. Secondly, as noted earlier, royalty taxes are often a necessary substitute when the direct taxation of rents is difficult, for example, in the resource sectors. Indeed, a royalty instrument is less vulnerable to profit shifting, particularly in a sector heavily reliant on hard-to-value intangibles. Thirdly, given the clear practical and political challenges of reforming income taxes to account for user value, well-designed user-based royalty instruments—which can also allow for some sort of netback to account for data processing—may provide a feasible and more realistic option. If designed and applied comprehensively and coherently to all services that use data as an input (that is, little or no ring fencing around specific digital services), they could provide a valuable alternative or complement to the corporate income tax.

³⁰ Such indifference does not hold for individual firms as the distribution of the tax burden can be markedly different; there is also no indifference in terms of distortions.

Box 10. 1. Digital User-based Royalties as a First Step on the Way to Formulary Apportionment

This box explores the outcome should all countries apply some sort of unilateral royalty on user-based revenues. In a static setting, we can consider the implications for two countries, *A* and *B*, which can either (i) unilaterally tax user-based revenues earned by a nonresident multinational enterprise for the provision of digital services, or (ii) apply a single corporate income tax rate to an agreed upon allocation—in this case based on user-based sales—of the multinational enterprise's globally consolidated profits. We want to derive the conditions under which tax revenues from the two systems will be the same for a country such that they will be indifferent between them.

We start with the following expressions for tax revenues in a country *i* from the application of a user-based royalty:

$$\tau_i^r R_i,$$

where τ_i^r is the royalty rate in country *i* applied to user-based revenues, R_i , earned by the nonresident highly-digitalized multinational enterprise in return for services provided to domestic users in country *i*.

Under user-based formulary apportionment of global profits, each country is assigned:

$$\tau_i^c \alpha_i \pi_G,$$

where $\alpha_i = \frac{R_i}{R_G}$ is country *i*'s share of total global user-derived revenues, and $\sum_{i \in \{A,B\}} \alpha_i = 1$;

$R_G = \sum_{i \in \{A,B\}} R_i$; τ_i^c is the corporate income tax rate for country *i*; and $\pi_G = \sum_{i \in \{A,B\}} \pi_i$ is the multinational's globally consolidated profits and $\pi_i = R_i - C_i$ is the profit generated in country *i* (but not necessarily booked there).

For each country we get the following under revenue neutrality of both tax systems:

$$\tau_i^c \alpha_i \pi_G = \tau_i^r R_i,$$

which, after substituting in for α_i , reduces to the following expression:

$$\frac{\tau_i^r}{\tau_i^c} = \frac{\pi_G}{R_G}.$$

What this highly stylized model shows is that for the two systems to deliver equal tax revenues for each country, the ratio of the two tax rates for each country *i* must equal the ratio of global profits to global revenues, that is, the global average profit margin. In other words, assuming all countries have introduced user-based royalties, a country can earn the same revenues as if all countries had agreed on a user-based split of the multinational enterprise's globally consolidated profits, if and only if the ratio of the corporate income tax rate to the royalty rate is the same for all countries.

Some recent proposals for turnover taxes on digital services already take on the flavor of a user-based royalty. These include the digital services tax proposed by the European Commission, and variants subsequently proposed or enacted unilaterally by individual member states. This formulation of digital services tax should be distinguished from non-user-based equalization levies on payments for digital advertising services. This type of levy was introduced by India in 2016 taking the form of a withholding tax on payments to nonresidents for certain

digital services. It has subsequently been expanded in scope in 2020 to a user-based turnover tax targeted only at nonresident businesses. Both types of tax attempt to target digital services provided by businesses operating remotely within a jurisdiction. They have also been formulated to sidestep income tax treaty issues by basing taxes on gross income (that is, sales/turnover) rather than net income (that is, profits)—for instance, as an excise tax on the supply of digital services or a tariff to protect domestic service providers.³¹

The Dangers of Ring Fencing

Regardless of the fiscal instrument selected, this chapter has consistently pointed out the importance of its general application to all types of businesses in the economy, with little or no ring fencing. With digitalization pervasive across the entire economy, it is both impractical and economically undesirable to single out more digital or less digital businesses or identify a so-called digital economy. As such, attempts to design policies specific to a so-called digital economy are potentially flawed—it is generally better for policy makers to ignore the distinction and take a holistic approach, particularly when it comes to areas such as international taxation. This was the view put forward in the 2014 report from the expert group on taxation of the digital economy convened by the European Commission (European Commission 2014), which noted that there should be no special tax regime for more digitalized companies. Rather, general rules should be applied or adapted so that there is equal treatment for all businesses. The OECD (2015) also suggested that countries should not attempt to ring-fence particular companies or business models for special tax treatment, noting that “the digital economy is increasingly becoming the economy itself.”

Nevertheless, as noted above, a more targeted and discriminatory approach has gained significant traction in recent years and is set to be implemented unilaterally by some members of the European Union. These measures not only target digitalized businesses, but also isolate both a particular size of business and subset of digital activities. A case could be made that some degree of early ringfencing could be helpful in the (very) short run as tax measures are tested and adapted. However, more generally, from the point of view of efficiency and neutrality, establishing a parallel tax regime for digital services and other digitalized business models would drive an inefficient wedge between the digital and the non-digital sectors of the overall economy. Moreover, poorly-designed and uncoordinated measures run the risk of becoming entrenched.

³¹ The OECD in its 2018 Interim Report provides guidance on the legal design of an excise tax on e-services, to ensure that they do not fall within the scope of income tax treaties. The case would be stronger where such an excise is (i) levied on the supply of a certain defined category or categories of e-services and imposed on the parties to the supply without reference to the particular economic or tax position of the supplier; (ii) charged at a fixed rate, calculated by reference to the consideration paid for those services (without reference to the net income of the supplier or the income from the supply); and (iii) not creditable or eligible for any other type of relief against income tax imposed on the same payment.

CONCLUSION

Digitalization—as a general-purpose technology—has unlocked the ability for businesses to collect vast amounts of data about agents in the economy from all manner of business-to-business and business-to-consumer transactions, including the so-called digital barter. By combining it with other nonrival, excludable intangible goods—such as intellectual property and knowhow—businesses have been able to design and remotely provide new and existing products and services at low marginal costs, fostering the emergence of large near-monopolistic and oligopolistic markets.

As businesses in almost every sector take advantage of the benefits of digitalization, the need to address the shortcomings and unresolved issues within the international corporate income tax system has become that much more urgent. The current system of arm's length pricing and the growing importance of near-impossible-to-value intangibles—including user data—has allowed opportunities for corporate income tax avoidance to proliferate. As a result, many countries are seeing profits shifted out of their reach by companies using transfer pricing tactics, while those without any permanent establishment-based taxing rights are missing out on the opportunity to tax these companies altogether.

As a result, the contribution of user data to the profitability of highly-digitalized businesses has become a rallying point for governments seeking to redress the perception of an unfair distribution of profits and taxing rights. A number of policy proposals have been put forward which seek to limit the scope of tax avoidance and tax competition, by attempting to pre-determine a distribution of taxable profits across countries. Many of these proposed rules for splitting income are predicated, whether implicitly or explicitly, on the idea that the user of a digital service has a role to play in value creation and which, if necessary, cede source-based taxing rights to the jurisdictions where they are located.

And indeed, as this chapter has argued, a plausible case can be made to tax this value generated by users under the corporate income tax. It seems reasonable to acknowledge that raw user data must have some underlying value prior to processing, just as any primary commodity has some value before it is transformed into a final product, for example, crude oil or timber. However, governments remain divided over its importance and the resulting implications for the distribution of profits worldwide. Should governments eventually recognise and agree on the importance of user data—and if the valuation of such data can become standardized along certain key dimensions/uses—its role in providing a basis for corporate taxation could help to remedy some of the shortcomings of the international tax system.

In practical terms, the first obstacle to overcome is the assignment of taxing rights to data-producing (user/market) countries through revised nexus rules (for example, a new permanent establishment concept). The second challenge is to design revised profit allocation rules which reflect user contribution. Most notably, there are no available market-based prices or established benchmarks to guide

how user data should be measured and valued, preventing governments from being able to quantify the importance of user data to production. In other words, the issue of user data has added to the scale of the existing valuation issues posed by intangible assets, while also expanding the potential number of countries claiming the right to tax. Both issues are heavily politicized and influenced by countries jockeying for position.

One of the cleaner solutions is rooted in the idea of formulary apportionment which reflects the user as a factor. Cleaner because it helps diminish the opportunities for profit shifting that exist under the current system of arm's length pricing. However, while some countries could gain—for example, large populous economies and those with greater purchasing power—others could lose in this shift toward a sales-based system. The formula can also be modified to accommodate (original) source economies, where these multinational enterprises—digitalized or otherwise—developed. Of course, international agreement on any formula is also likely to be fraught.

There are a number of possible solutions that fall between the old and the new. The new family of solutions go halfway toward full-blown formulary apportionment, while retaining elements of the existing arm's length pricing. Two such related proposals gaining traction are those of marketing intangibles and residual profit allocation. Both approaches acknowledge the rights of—and reallocation of income to—market jurisdictions, while preserving the rights and tax bases of current source-based jurisdictions.

Other instruments are available to governments seeking compensation for the use of their citizens' personal data. Such measures can either substitute (in the short term) or complement existing taxes, such as the corporate income tax. One example is a royalty on the value of user data, proxied by revenues from digital services until a market for data develops. These revenues could also be adjusted to account for a highly-digitalized business' value added from the processing of data using some form of netback deduction. Indeed, while multilateral consensus should remain the endgame, this chapter has also highlighted that under simplifying assumptions, where all countries calibrate their tax systems to global profit margins, unilateral adoption of user-based royalties could lead to an outcome where countries are indifferent (in terms of revenue) between these taxes or user-based formulary apportionment. In other words, under these specific circumstances, the gradual and sequential implementation of user-based royalties could eventually bring the world toward a corporate taxation system apportioned by user-derived sales.

However, these measures are not without their potential pitfalls, particularly if uncoordinated. Possible drawbacks include the creation of undesirable disincentives for investment, and the proliferation of double taxation and excessive tax burdens due to multiple royalty rates and bases, administrative complexity, and the risk of misclassified activities. The resulting variation in effective tax rates across jurisdictions could have a tangible impact on global resource allocation—all in return for potentially very little tax revenue. There may also be political economy costs from retaliation.

The absence of international consensus and a lack of clear data valuation methods have already pushed many countries to impose targeted turnover-based measures on varying subsets of digital services. In some cases, indirect proxies for user value are used as the tax base, for example, revenues from online advertising or from remote selling through online platforms, where the transaction value is observable. Other governments have side-stepped the valuation issue by basing their taxes on directly observable indicators, such as the volume of users. While these are all practical solutions, the risk remains that they do not sufficiently address the issue of taxing profits from value created—in this case by users. Furthermore, such an inconsistent approach could leave countries with a patchwork of overlapping measures that create more problems than they solve.

Moreover, with digitalization permeating all sectors of the economy, user data is being exploited at a scale large enough to be recognized as an economic input to production. It should therefore be recognized for all businesses that do so—even if with varying degrees of intensity and relevance—with little or no ring-fencing of specific digital activities. Empirical data also does not conclusively suggest that highly-digitalized companies are particularly different (in terms of profitability, intangible assets, and effective tax rates) from other large businesses—though it is important to note that the data is insufficient to definitively identify differences between companies and sectors.

What this chapter attempts to highlight is not only the value of the user to highly-digitalized businesses but also that the user is likely to become increasingly important for all businesses going forward. Therefore, it is important to consider their role in providing a basis for taxing rights and the attribution of profits. For this reason, shifts in the international tax system to reflect their worth not only seem inevitable but also tec(h)tonic.

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