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Money for Nothin' – Digitalization and Fluid Tax Bases

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Money for Nothin' – Digitalization and Fluid Tax Bases

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Money for Nothin' – Digitalization and Fluid Tax Bases

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Abstract

Technology and digitalization are transforming economic activity, but tax policies are lagging behind. The development also encompasses a broad shift in value-creation, with less emphasis on physical production and more on soft knowledge/intangibles, notably copyrights, firm-specific processes, data and software. We discuss what these changes imply, and we outline the economic factors of scale- and network effects that magnify existing economic trends. A key concern is that the distortionary effects of taxation will become more severe and that tax bases will erode. As factors of production are becoming more fluid and mobile, multinational corporations have been able to shift their profits to low-tax jurisdictions, so called base erosion profit shifting (BEPS). To counter this possibility, a number of governments in 2019 began to unilaterally impose taxes aimed specifically at digital firms. Unless a broad agreement can be reached within the nexus of the more than 130 countries in the OECD/BEPS framework, the existing multinational rule-based order for corporate tax could begin to crumble. On the domestic front, the tax challenges for labour income are, if possible, even more extensive. Although the labour market changes are slower, their key role in public finances imply that even minor reductions result in significant funding challenges. To ensure we get *money for somethin*', we conclude that a new comprehensive tax reform is urgent.

Keywords: Digital tax, OECD/BEPS, digitalization, taxation.

JEL codes: H21, H25, H26, H27, O33

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1. Introduction

Technological developments are building up unprecedented tensions in the international tax system. These tensions are expressed in several ways. One of the most salient to public sector finances is that some multinational companies pay almost no corporate tax, even in jurisdictions where they make large profits. But the effects of digitalization go much further than that. Most economic activity is being reshaped. Without an overhaul of tax systems, economies face further risk of eroding tax bases, which in the medium-to-long run undermines the financing of public welfare. In addition, without tax and regulatory reform, economies risk anaemic growth in the years ahead. While the effects of technological trends are far-reaching, they present challenges to policy makers, since their effects are gradual and over long periods of time. In contrast, short-term issues—such as business cycle fluctuations and their consequences—often dominate the news, and therefore current policy agendas. For example, a factory that is forced to close down is an event that is easy grasp, but the gradual shift of skills requirements and technology is not so easily discernible. This difficulty makes it all the more critical that policy proposals are based on a correct diagnosis of how the functioning of the economy changes over time, and an understanding of what happens when imbalances build up and are ignored. This lesson has become readily apparent because of ruptures in the financial markets. In the aftermath of the financial crisis of 2007–2009, the fragility of the financial system came in full display; it became painfully clear that our knowledge of systemic risks in the financial system were, at the very least, woefully incomplete.

Of course, the effects of financial fragility and technology differ in many key respects. The erosion of tax revenue occurs gradually, over a prolonged period of time. But the long-run effects are nevertheless as pivotal for society as the short-run effects of financial turbulence. As economic polarization increases in the EU, the need to develop a fair and efficient distribution of the tax burden becomes more urgent. And as individuals and companies increasingly earn their revenues in ways that differ markedly from when the tax system was devised, that system must be reformed. Although as a rule, the effects of digitalization on the tax system appear gradually, there are exceptions. In October 2019, an agreement in principle was reached on how future corporate taxes should be treated in international taxation. The context for this agreement is the so-called OECD/BEPS negotiations that we discuss further below. While there are many details that remain open, in general, the proposed reforms could imply a far-reaching shift in the way businesses pay taxes and how revenue is distributed between states.

Closely related are the legal issues for taxing digital services in the EU and beyond; however, our focus in this paper is on taxes and digitalization from a purely economic perspective.[3] In particular, we focus on the main role of the tax system in the economy: the financing of the public sector and the welfare state. We recognize, of course, that governments and politicians assign a host of other objectives to the tax system, such as the promotion of economic growth, the redistribution of incomes, the support of healthy lifestyles and diets, the reduction of alcohol consumption, and the reduction of damage to the environment. Research on taxes often focuses on how taxes should be designed to achieve a variety of different policy objectives while reducing negative side effects. Our paper follows this tradition, but with a specific focus on the impact of digitalization on the core question of how to raise taxes to finance the public sector. Along the way, we also touch on other issues, notably equity, growth and redistribution.

[3] See, for example, Rendahl (2020).

One difficulty for tax policy is that there are goal conflicts among policy objectives. Increased environmental taxes, for example, provide incentives to reduce harmful emissions, but they risk adverse effects on employment if they induce a company to relocate elsewhere. Since countries in the EU are closely intertwined through the internal market, such effects could be substantial. This is one of the reasons why the EU has developed a regulatory framework that concerns the taxes that affect other member states. This is especially true for VAT on goods and services, where member states are limited to having a maximum of three different tax brackets. There are also restrictions that guarantee the brackets do not fall below specified levels. In this way, potential conflicts between different countries are reduced.

Over the years, considerable research has focused on understanding how taxes affect the incentive to work; great insights have been gained about the various trade-offs involved—for example, how to encourage work and innovation through low taxes, on the one hand, and how to raise taxes to finance public spending, on the other.[4] Digitalization does not entail any fundamentally new trade-offs in this realm; instead, old and familiar ones appear in new shapes and forms. We should also be clear at the outset that by digitalization, we do not mean to imply technological change per se, but rather its impact on work, production, and leisure.

In this paper, we discuss how the economic effects of digitalization can have far-reaching consequences for countries' ability to tax. It is becoming easier and cheaper to replace human work with machines or computers. Our argument is *not* that countries will be unable to collect taxes: the ministries of finance have a multitude of instruments in their arsenals, ranging from VAT, to capital and excise duties, to reducing mortgage interest rate subsidies. Rather, the argument is that choices made by consumers, for a given set of taxes, span a wider array of options. Therefore, the distortionary effect of taxation on what would have been an unconstrained outcome will increase substantially over time. Or put differently, the cost of distortionary taxation will increase due to the expanding technological capacity to shift factors of production. This discrepancy between tax policy and the options technology makes available to businesses and consumers not only limits economic growth, it increasingly endangers the potential for taxes to achieve other social objectives.

In what follows, we discuss how digitalization affects core tax bases. The combination of globalization and technology has resulted in economies becoming more sensitive to global tax rates, notably through the ease with which factors of production – and thus tax bases – can be moved to more favourable low-tax jurisdictions. The problem is noted in legal work and in popular news media but has so far received scant attention in economic research. Our paper summarizes the available research and points to some policy implications for the design of the tax system in the EU and individual countries.

By far the most important tax is that on labour. In OECD countries, it accounts for roughly half of all government revenue. Even small changes in the tax base can significantly influence tax revenues.[5] Another important tax base is corporate profits. The OECD estimates that corporate taxes accounted for just over 13 percent of public revenue (based on an average over some eighty countries) in 2016. Corporate taxes are thus a smaller source of income than taxes on labour, but are nevertheless large enough to be significant. However, the design of corporate tax is important for creating conditions for economic growth. A high level of corporate tax is often cited as harmful to the economy.

This paper begins by discussing general trends. In the next section we describe how digitalization becomes an additional lever that amplifies existing economic forces. One factor

[4] See for example Gruber and Saez (2002) and Kleven and Schultz (2014).

[5] See Chapter 5 in Blix (2018).

behind these changes is the increasing importance of so-called intangible assets, as discussed in the following section. The changes we highlight affect the entire economy and, by extension, the tax bases. The first tax base we examine is tax on labour. More specifically, we discuss how the wage share of labour in the economy has decreased over time and the consequences this will have for tax revenue. Then we turn to corporate taxation and the issue of how multinational companies are taxed in different jurisdictions. The subsequent section analyses the implications of the sharing economy and so-called gig jobs on tax revenue. We summarize the effects on different tax bases in the penultimate section. The chapter concludes with a policy discussion.

2. Digitalization amplifies economic forces

One way to illustrate how the economy changes and how that affects taxation is to study how companies and their business models are affected by digitalization. The fortunes and misfortunes of companies often coincide with their ability to adapt to changing market conditions as technological advances open the door for new goods and services. In a well-functioning market economy, we would typically expect at least some of the largest companies to change over time. Let us take an example: during the 1980s, the US camera company Kodak was one of America's most highly valued companies. It was a leader in developing and commercializing digital imaging technology. Although the company was a pioneer in digital imaging technology, it was unable to transform its organization from its historic roots in physical film.

Moving beyond the Kodak case, let us look more closely at how the ten most highly valued companies changed between 1980 and 2017. A study by the International Monetary Fund (IMF) shows that *none* of the largest companies from 1980 are left on the new list for 2017, which now also includes two Chinese companies. The new list, detailed in Table 1, is not only dominated by American and Chinese IT companies, it is comprised mainly of companies that have reached stratospheric valuations within a relatively short period of time. The two IT companies Amazon and Apple have on occasion surpassed a valuation of more than one trillion dollars (a thousand billions), almost twice the size of Sweden's GDP in 2018.

Table 1. The ten companies with highest market capitalization in 1980 and 2017

1980	Exxon Mobil, General Electric, Coca-Cola, HP, IBM, Walt Disney, Eastman Kodak, Ford, Intel and du Pont.
2017	Alibaba, Apple, Alphabet (Google's parent company), Microsoft, Amazon, Facebook, Tencent, Berkshire Hathaway, Johnson & Johnson and JPMorgan Chase

Source: IMF (2019, p. 14).

Furthermore, there is *no* European company on the top ten list. This is one reason why the US and many EU countries have partly conflicting interests in designing a digital tax (which we return to below). Thomson Reuters publishes lists of the most valued companies in the world; the figures for 2018 foreshadow a continued bleak picture for Europe. The highest-ranking European company is the petroleum company Royal Dutch Shell (which placed 15th in 2018). And according to *Forbes* magazine, in a list of top 100 IT companies, the highest-ranked European company barely achieved a top twenty position.[6]

[6] The rankings from Forbes change a bit from-year-to-year but the top IT companies are dominated by China, USA and South Korea.

What are the economic forces behind these major changes? A decisive factor is the ability to scale operations at little (or no) marginal cost. Unlike in a physical factory, where it is typically necessary to invest in new machines to increase production beyond some level, it is essentially costless to deliver a digital service to an additional customer. This makes it easier for digital companies to operate on a global scale. Another key factor is the benefit of network effects, which imply that the value of using a service increases exponentially as more people join. For example, the value of an individual's activity on Facebook becomes greater the more his or her friends also participate. This further contributes to the profitability of acting on a global scale.[7]

Granted, economies of scale have always been present in production, but digitalization has dramatically amplified these effects. When Sergey Brin and Larry Page worked with search optimization in the mid-1990s, they downloaded essentially the entire Internet to some servers at Stanford University in the United States. This work subsequently became the basis for starting Google, which within a short period of time had global reach and impact. Some other digital companies have also reached very high market capitalization within a short period of time. Digitalization has changed how value is created in the economy and has thereby also increased the mobility of tax bases. According to IMF, "the international corporate tax system is under unprecedented stress."[8] While companies have certainly been able to move their physical production in the past, the global expansion of the world wide web has provided them with greater opportunities to locate to low-tax jurisdictions or to the cloud. At the same time, as we will discuss next, intangible knowledge has increased in importance, transforming the economic landscape and ultimately leading to more mobile tax bases.

3. Intangible knowledge exceed physical capital

The way the economy generates value is shifting. Machines, buildings, and physical infrastructure remain important parts of the capital stock, but their relative share of value creation is gradually decreasing. As technology advances, the value of intangible assets – or "soft" knowledge – becomes more critical. These assets include knowledge of company-specific work processes, designs, patents and copyrights, and data and software. Digitalization is an integral part of this development as more companies sell digital services or provide existing services via websites or platforms.

Intangible, knowledge-based assets, need not be completely unmoored from the physical dimension. Though easier to move than physical structures, they cannot be be moved seamlessly or arbitrarily. This is particularly evident when it comes to the recruitment of those with top-tiered skills. Many digital companies are based in Silicon Valley because of the access to people with the requisite skills and knowledge. Take the example of Apple, whose production is almost exclusively in Asia and especially in China. Apple "owns" almost nothing in its production chain, but can nevertheless impose more or less iron-clad demands on its subcontractors. Apple's products have the insignia "Designed by Apple in California – Assembled in China." All of the decisions that make iPhones so popular are based on knowledge available in Cupertino, California. Thus, it is quite clear that the value is largely generated in the United States.

As the importance of intangible knowledge in the production chains grows, physical or digital goods can be placed in locations that yield the most benefits. Digitalization thus gives an extra push to the flexibility of global value chains. Consider, for example, companies that mainly

[7] See OECD (2018).

[8] IMF (2019, Executive Summary, para. 1).

sell digital services, such as advertising on social networks or search platforms. Even though Facebook and Google earn their revenue from local markets, their business model and know-how is concentrated in Silicon Valley. As a result of digital business models, only a fraction of the revenue in the country of operation is taxed locally. Perhaps unsurprisingly, several countries around the world want to amend international treaties on taxation to allow them to benefit from these profits (more on this later).

A general difficulty in this area is that intangible capital tends to be harder to measure than physical capital. However, research in this area has made some progress. There is new evidence that in the US, the value of aggregate intangible assets became larger than the value of aggregate physical capital (including buildings and equipment in 1993.[9] Calculations show that the share of Sweden's GDP that is comprised of intangible assets is the largest in the world, even higher than in the US. In Finland and the UK the share of intangible assets is also large, while some countries in Southern Europe have low or very low shares.

Finally, we want to touch on perhaps the most mobile production factor of them all: cloud services. Through large servers, Amazon, Cisco, Google and IBM can provide digital processing of large amounts of data. For example, you can buy server time to run artificial intelligence, AI, and machine learning programs, methods that are becoming increasingly important in academic, security and commercial applications. But cloud services also include storage of data, such as Dropbox. Companies can relatively easily move their cloud services to a country with low taxes. Additionally, through the use of so-called virtual private networks (VPN), it is relatively easy to hide services from prying eyes, including tax authorities.

In summary, intangible knowledge and capital are increasingly important for growth and value creation. Production factors that have long been able to move between countries gain even more mobility because of digital applications, which puts the corresponding tax base under pressure. We return to these issues, but will first discuss the largest tax base: labour income.

4. Falling wage share of labour reduces the pie that can be taxed

In most countries, the most important tax base comes from labour. In OECD countries, taxes on labour generate about half of all public revenue. The share is even higher in countries with large public spending, such as in the Nordic countries and parts of the EU.[10] If we consider VAT as a tax on labour income, the share of tax revenues from labour is even higher.

The public debate has sometimes focused on whether robots will replace human work and what consequences this might have for unemployment and, by extension, the opportunities for ordinary people to earn a living. We argue that this debate distracts from more pressing policy issues. Taxes on labour constitute such a large tax base that even small changes in employment and hours worked will have major consequences for government revenue. Estimates from the Swedish government's long-term scenarios show that the number of hours worked in the economy is crucial to financing the welfare state.[11] In these calculations, the

[9] Haskel and Westlake (2018).

[10] Blix (2018).

[11] In the 2019-base scenario, this takes the form in that GDP is assumed to have less and less contribution from hours worked due to the rise of the old-age dependency ratio, see Ekerby et al. (2019, p. 50).

sensitivity of hours worked in the welfare state is related to the consequences of an aging population that shrinks the share of those who work.[12]

The challenge from digitalization is that tax bases may erode as jobs shift from humans to robots. To cope, the welfare state may need to adapt regulations and improve the flexibility of the labour market. For countries with high taxes on labour, for example several EU countries, the challenge is even greater; government revenue may be at risk if tax bases are not broadened or rates changed.[13] The way in which this is done is of great importance to society, the labour market, and GDP growth.

What are the processes that might result in less tax revenues from labour? Automation has affected many tasks and is expected to do so even more in the future. Historically, it is in the manufacturing industry and in agriculture where human labour has been replaced by machines.[14] In the future, we can expect this trend to continue. Consider some examples. When self-driving vehicles are eventually allowed to leave the garage and take to the streets on their own, we can expect that demand for taxi and truck drivers, as well as as that for driving schools, will be reduced. The same logic applies to insurance services linked to the auto industry. Agriculture has so far required some human activity for the handling of fruit and vegetables, but this is also starting to change. Machines are now so sophisticated that they can take on an increasing range of such tasks. Logistics warehouses used by, for example, Amazon and Wal-Mart in the US, and Clas Ohlson in Sweden, have increasingly been semi-automated and a greater share of tasks has been taken over by machines. In the UK, the company Ocado has shown how to apply digital technology to scale up the delivery and handling of fresh vegetables and other agricultural products.

Advancement in artificial intelligence (AI) is arguably the harbinger of the next wave of automation in skilled work. Machine learning algorithms from the company "Deep Mind" can already develop winning strategies from scratch, and need only be told the rulebook to get started.[15] This is a significant step from the performance of the first machines developed by IBM. They were good enough to beat the world's best chess players but were specifically trained for that purpose and could essentially do nothing else. Today’s AI learns by playing a very large number of games against itself.[16]

Technology is very successful in specific domains, but as of the early 2020s, there is no so-called general AI that can outperform humans in versatility or adaptability. It is difficult to say whether such a general AI will be achieved in the coming years, decades, or ever.[17] What is clear, however, is that continuous advances towards general AI do affect what skills are in demand. Success in the labour market now requires abilities in realms where robots still underperform compared to humans, such as cognitive agility, social skill, and flexibility. The highest degree of automation tends to be in areas where work is repeated in predictable ways.[18]

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[12] For an overview of the other studies on the Swedish Welfare State, see Blix (2013).

[13] Blix (2018).

[14] See, for example, Frey (2019) and Autor (2015).

[15] Silver et al. (2017).

[16] https://deepmind.com/blog/alphago-zero-learning-scratch/.

[17] For an overview of the issues, see Bostrom (2014).

[18] Autor (2015).

Let us take an example from the highly specialized professions. In healthcare, AI has proven to be as good or better than dermatologists in detecting cancer.[19] Similar developments are likely in other areas that require a large amount of data. When provided with a key for what the "answer" looks like – an already made cancer diagnosis or some other word/image – a robot can detect the pattern and find similar instances in new health data. People are increasingly becoming inferior in contexts that require processing of large amounts of data and the application of specific rules, especially under time pressure.

Despite the rapid development in automation and AI, however, the concern that jobs will disappear is overblown. It is true that major changes are driven by digitalization, but there is a fairly large consensus in economic research that jobs *are not* are disappearing overall.[20] Although particular jobs are continually disappearing, new jobs are also being created. At the outset of industrialization, there were some occurrences where entire professions disappeared, for example when steam-powered or electric machines were introduced.[21] Subsequently, the trend has been for well-defined tasks to be automated, while many professions survive in that the content of jobs shifts over time. As some parts become automated, humans can essentially focus on other parts of the production chain.

What should instead be subject to analysis and reflection is the fact that the wage share of income has decreased over time. In most industrialized countries—for example in France, Germany and the United States—the share of GDP income that comes from wages has declined.[22] The size of the decline varies. For those countries where data is available, the fall is on average five percentage points between 1975 and 2012. The development in Sweden differs from most other countries in that the decline occurred in the 1980s and then stabilized at a lower level.[23]

There are probably several explanations for this development. One explanation pertains to the role of large companies.[24] Digital technologies have increased “winner takes all” tendencies.[25] This is especially the case for goods and services, where there are large fixed costs to start a business but the costs to add a new user are small. It is more profitable to have *one* social network with a billion users, rather than four networks with 250 million users each. Economies of scale are also increasing due to new technologies that enable internationally integrated markets. Companies that fluidly inhabit those markets can become very profitable but have few employees who are taxed. In other words, the management and owners of these companies can claim large compensation or make large capital gains. It is cheaper to invest in machines that replace human labour. As this is done, a larger share of total output instead goes to the owners of capital – and less to the employees.

Another line of research shows that the relationship between technological development and the labour share of income depends on a number of factors. First, new technology leads to increased productivity and consequently increased overall demand. Second, new technology

[19] For an overview, see Blix and Levay (2019).

[20] Heyman et al. (2020).

[21] Frey (2019).

[22] Karabarbounis and Neiman (2014).

[23] Blix (2018).

[24] Autor et al. (2017).

[25] Autor et al. (2019).

can lead to human work being replaced by robots.[26] Third, new technology can lead to demand for new services that were not previously demanded. The declining wage share in the US can be explained by the emergence of so-called "superstar" companies where a few individuals can control, using digital tools, very extensive operations.[27] At the aggregate level, the IMF estimates that about half of the fall in the wage share of GDP can be attributed to automation over a number of decades.[28] The long-term forces pushing labour towards a smaller share of national incomes are strong, but come only gradually and therefore tend to receive scant attention compared to business cycle fluctuations.

Another consequence of technological development is that people will probably work less in the future. This is mainly due to two factors. First, falling working hours is a long-term trend in society. For example, data from the Dutch Maddison project shows that from 1870–1990, hours worked per capita was halved, falling from about 1400 to 700 hours per year.[29] A continued substitution of robots for humans will likely have a large impact in the future, as robots continue their entry into the labour market. Such a gradual reduction in working hours—about 0.5 per cent per year over a long period—is hardly noticeable from year-to-year, but is of great importance when the effects accumulate over time.

Second new technologies lead to leisure time becoming "cheaper," which can become a growing problem for tax authorities. Many games and other digital services are ostensibly free of charge, but indirectly, there is a cost. This applies to everything from popular email to search or navigation services. Instead of directly charging consumers for a popular service, there is a form of agreement (or contract) between the companies and the consumer, where the latter gives away personal data, which can then be used for digital advertising or marketing. It is revenue from such advertising that fully or partially finances several digital companies that have grown to become very large, notably Facebook, Google and Twitter. In popular games, such as *Fortnite*, playing is free of charge, but the company offers various forms of digital packages for sale in the game and garners revenue in this more indirect way.

Services that on the surface are provided freely thus generate income in other ways, and have grown substantially in size and importance in the economy. At the same time, such “free” services are difficult – or perhaps impossible – to tax directly as consumption, because there is no traditional transaction where money changes hands from a buyer to a seller. The technology for collecting VAT on a “free” service has not yet been developed. The rise of free services can also have other indirect effects. Buying physical goods and services can be a way of acquiring status and thus boost the value of leisure time. With the advent of free digital services, less income is needed to enjoy leisure time. We can think of this as lowering the price on leisure time, which may alter the incentive to work.

5. Pressures within international corporate taxation

Corporate tax is a not only a source of revenue for the state, it also has strong symbolic status in political discussions about growth, distribution, and competitiveness. Previously, it was primarily multinational companies that could move or shift their operations and factors of production around the world to maximize profits with relative ease. Technological development and digitalization have made it easier for small- and medium-sized companies to do the same. As we discussed above, it is often the intangible parts of digital companies, such

[26] Acemoglu and Restrepo (2019).

[27] Autor et al. (2019).

[28] IMF (2017, p. 78).

[29] See https://www.rug.nl/ggdc/historicaldevelopment/maddison/.

as programs and data, that are important. Given a satisfactory level of physical infrastructure, the choice of the actual physical location is subject to larger degrees of freedom than before. IT-companies, for example, can choose to build a data or distribution centre where the state or municipality provides a substantial tax subsidy, as was the case with Facebook's servers in Luleå in the north of Sweden. Corporate taxes are thus just one of many factors that a company takes into account when making decisions.

The link between the level of corporate taxes and the amount of money they contribute to public coffers has received considerable attention. Although corporate tax rates have been trending downward since the 1990s, revenues have remained fairly stable.[30] The fact that many countries have successfully lowered the corporate tax rate comes from an understanding that high rates are detrimental to growth in both an absolute sense, and in relation to other countries.

There has also been a concern that international tax competition would lead to a race towards ever-lower corporate taxes (a "race to the bottom"). In the 2010s, this concern was partly replaced by a debate between countries about who is entitled to tax the profits of multinational companies. Digitization has led to an increasing number of companies operating in several countries at the same time, so the question of how countries should coordinate corporate taxation has become increasingly urgent. According to existing rules, companies pay taxes where the value is created, but even countries that do not have large digital companies want to tax their profits. Some businesses—mainly digital ones—make significant profits but pay little corporate tax in many countries where they operate. This has been particularly evident in Ireland, which has a low corporate tax rate and has attracted several digital companies. In that context, the European Commission pursued a lawsuit against the Irish government, arguing that some companies have received undue tax advantages. The companies, on the other hand, argue that they only followed rules and established practices. For example, in an open letter in 2016, Tim Cook, CEO of Apple, argued that the debate is more about which countries collect the tax revenue than the overall level of the company's corporate tax.[31]

The discrepancy between global profits and locally paid taxes has led to many newspaper headlines and been a topic of controversy in business-focused media. On the one hand, it is difficult for most people who are not specialized tax lawyers to evaluate the arguments put forward, but on the other hand, many people's views on what constitutes a fair tax are challenged. In 2016, for example, the village of Crickhowell in Wales experienced something of a tax revolt when it was discovered that a small bakery paid higher corporate taxes than Facebook.[32] The more complex the rules and the more exceptions to the general principles, the further it benefits primarily large companies as they have access to the best (and the most expensive) legal expertise. But the example from Wales shows that people have a strong view of what constitutes fair taxation.

According to estimates from the OECD, global tax planning is estimated to cost governments about USD 100–240 billion in missing revenue to the treasuries on an annual basis.[33] Another estimate from the IMF shows that tax planning in OECD countries costs about 1 percent of

[30] Baert et al. (2019).

[31] Cook (2016).

[32] De Freytas-Tamura (2016).

[33] OECD (2015a, p. 15).

GDP, while in developing countries the loss is even higher.[34] For example, 1 percent of Swedish GDP would cover more than the country's entire legal system in 2018. However, identifying missing income due to tax planning is by no means the same as actually raising that money. Stricter rules risk creating a larger administrative burden for small and large companies alike.

In order to reach an agreement on where taxes should be paid, international cooperation is necessary. One of the most far-reaching projects is the so called Base Erosion and Profit Shifting project, BEPS, which is run by the G20 and the OECD.[35] To date, more than 130 countries cooperate within this framework to harmonize the principles of corporate taxation. The purpose of BEPS is to deal with the problem that companies can exempt profits from taxation or move profits between countries. Here, the EU has an important role. Most aspects of taxation are decided by member states but some aspects are subject to rules at the EU level.[36] When EU countries are united, binding decisions can be made for member states, but it is often a laborious process to reach consensus. A coordinated EU is also an important force for change within OECD/BEPS.

During the 2010s, a number of tax treaties and directives were created both within BEPS and in the EU. However, there is a risk that the coordination of the interests of various states will be more difficult in the future. States have not only a material interest in attracting company headquarters and their high-value activities, they also often value the symbolism of the location choice. More importantly, countries need tax revenues to fund welfare services as their populations age. At times, these symbolic and fiscal needs fuel tensions between countries.

In 2018, an attempt was made among EU Member States to introduce a "digital tax" of 3 percent on the turnover of digital companies, for those companies with a turnover greater than 750 million euros. One problem with such a tax would be that it creates additional special rules and new boundary problems. In addition to the additional layer of complexity, critics also fear that it further distracts the attention from distortionary tax exemptions given to large traditional European companies.[37] In addition, it would hamper developments in the EU compared to Asia and the US. However, the EU requires unanimity for such decisions and the proposal was vetoed by Sweden and Ireland. These countries have several digital companies that would be hurt by the new tax. As we discussed above, it is already worrying that Europe has so few successful companies, and a digital tax is likely to further aggravate the outlook. Countries that invest in the competence of its people through schools and universities should receive some of the value that arises when people with high skills create successful companies in the country.

The British business newspaper *Financial Times* reports that several EU countries started to go their own way in 2019.[38] This illustrates one possible future trend: there is a risk that the world will move towards increased conflict and tax competition. In the EU, we see that

[34] See Figure 1 in IMF (2019, p. 10).

[35] Much of BEPS work can be found at http://www.oecd.org/tax/beps/.

[36] Andersson et al. (2010).

[37] Bauer (2019).

[38] Politi et al. (2019).

France is ready to introduce a digital tax, while the UK, Spain, and several other countries show signs of following suit.[39]

The conflicts over corporate taxation, however, might slowly be heading towards a solution. Within the framework of the BEPS project, there are three main ways to change corporate taxation:

- To tax the digital business based on the location of users.
- To tax corporate customer data, insofar as it is used for marketing purposes.
- Taxing companies with significant operations (measured appropriately) in a country for the profits that arise in that country.

In October 2019, the OECD/BEPS reached an agreement, in principle at least, based primarily on the first- and last-mentioned approaches.[40] In the future, the agreement will allow countries to tax parts of multinational corporate profits when the users are accessing the service within their country, thereby reducing the possibility that multinationals can escape taxes by choosing the most advantageous tax regime. In addition, countries will be able to tax multinational companies that have a physical presence in the country.

The proposal has received much attention, yet many details remain unresolved, not least of which are the definitions and thresholds to be applied. In November 2019, the OECD took another step toward concreteness, publishing a proposal for a minimum global corporate tax.[41] It remains to be seen if the EU can rally behind it. It would reduce the opportunities for countries with low corporate taxes, such as Ireland, to use their low taxes to gain a competitive edge. The US was initially supportive of the proposed changes but seemed to reverse its stance in December 2019 when Steven Mnuchin, the US Treasury Secretary, sent a letter to the OECD raising "serious concerns."[42] So far, the OECD proposals have created a backlash from multinational corporations while others argue that they only present a patchwork and do not go far enough.[43] The EU has countered by attempting to put pressure on the US.[44]

While further ups and downs of the OECD BEPS negotiations are likely to follow, it is clear that much work will be required to bridge viewpoints between countries with conflicting tax interests. On a positive note, the initial soundings of agreement on principles, at least, indicates a willingness for reform. But much is at stake if the negotiations fail or drag out over time. For companies, there is increasing uncertainty about the size of future tax payments, which might reduce the returns on investment and research, not least into digital technology and AI. For consumers in Europe, there is also the risk of ending up with more expensive or lower quality services, or sometimes not getting access to some services at all.

6. The Challenge of Gig Jobs and Platform Services

Gig jobs have become an increasingly common feature of the labour market. They are characterized by lack of an employee/employer relation and are often found via platforms. In terms of taxation, they are a minor source of revenue, but have received a great deal of

[39] Rendahl (2020).

[40] OECD (2019a) and Giles (2019a).

[41] OECD (2019b) and Giles (2019b).

[42] Fleming and Brunsden (2019).

[43] Plender (2020).

[44] Fleming and Brunsden (2019).

attention and have become a symbol of the challenge technology poses to established institutions, including the tax system. For example, in Europe *Uber* is registered in the Netherlands, and does not regard its drivers as employees but as self-employed or as corporations. These kinds of choices have created controversy in many countries.[45]

In terms of taxation, it is not only the level of tax rates that matters, but also the neutrality between different forms of businesses in relation to tax levels and the costs that regulations entail. The difference is most apparent when it comes to platforms that provide services. In England, for example, accommodation rental services via the *AirBnB* platform face a lower tax rate than ordinary hotel activity. According to calculations by the *Financial Times*, savings from different tax treatments amount to about a third of the total cost savings.[46] The reverse problem also exists; digital producers experience cost disadvantages. Digital books are often taxed in the EU as an ordinary service, while physical books often have a much lower VAT.[47] It is possible to justify a lower tax on books (and knowledge), but the situation is awkward when nearly identical products are taxed differently depending on different formats of delivery.

Thus questions about how platforms are to be taxed contain many difficult dimensions that do not relate directly to the total amount of tax revenue. Political assemblies have been slow in adapting legislation, with the consequence that these difficult dimensions have been dealt with primarily as technical questions, by tax administrations around the EU. However, at least since 2015, these questions have started to attract more and more attention from the EU. What is at stake for the tax system?

In the public debate, the discussion around gig jobs either focuses on the positive aspect of the new services—the increasing value for consumers—or the negative aspects of income volatility and social uncertainty for freelancers. Notably, people working in the gig economy as self-employed are unlikely to have the same access to the social security system as those in regular employment contracts.[48] In Sweden, the differences are even more significant, as the self-employed do not get the benefits included in collective wage bargaining agreements, such as the topping-up of income during parental leave, and further health and insurance polices.

New digital technologies make it cheaper and easier to hire gig workers. Platforms such as *TaskRabbit* in the UK or *TaskRunner* in Sweden make it easy for individuals to order gig work for a variety of household services. With a few keystrokes, it is also possible to obtain highly qualified services in law, finance, design, and software. Opportunities for self-employment are expanding. An author can print her own book in large editions through the internet, and many other services can be coordinated through mobile apps. Goods and services can be obtained quickly, cheaply, and easily via different platforms. This is appreciated by consumers, who use platforms for an expanding set of goods and services. People with low incomes have more opportunities to buy services rather than spending money on expensive durable goods they might only rarely use. Beyond the well-known case of *Uber*, there are also many other services where it is possible to share an available space in a car via an app, which can be a viable alternative to buying a car.

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[45] For an overview of the gig economy, see Abraham et al. (2018).

[46] Houlder (2017).

[47] Blix (2015, p. 152).

[48] For a discussion of the different benefit levels between permanent, temporary and the self-employed, see OECD (2015b). See also Blix (2018, p. 135–6)

Digital entrepreneurs are in search of new niches with untapped resources and products with high prices, such as festive clothing or drills that are only used once or twice a year. They also change how the demand for household services is met by using technology that saves time, making it easier to shop for groceries, get cleaning done, and send flowers, to name only a few examples. Of course, such services are not new, but they can more easily match supply with demand and offer lower costs in a way that is of great importance to the economy. *Amazon's Mechanical Turk*, which can provide gig workers with very small incomes for doing short and simple tasks, is a case in point.

A 2014 survey by the Freelancers Union, which represents and provides support to gig workers, found that 34 percent of all working in the United States have participated in activities in the sharing economy.[49] The European sharing market does not have as much gig work as the US, but the form is becoming increasingly important, particularly in the UK and the Netherlands. We can expect the sharing economy to have a greater impact in the future in countries with more regulated labour markets, unless development is limited, for example, by new legislation.

Overall, gig work and platforms provide a more flexible way of working, especially in European countries that have strong employment protection for insiders in the labour market. However, as more and more people become employed as gig workers, they are also exposed to higher risks, since the welfare systems are primarily intended for full-time employees. The public debate has centred on the weaker position of gig workers in the labour market compared to regular employees. Through the employment contract, employees receive a predictable salary, some job security, and many other benefits. In the US, for example, health insurance is typically linked directly to employment, and in Europe it is similarly easier to qualify for social security when in formal employment.

What does this entail for consumption and tax revenue? An important factor that may affect revenues from consumption taxes is that the benefits of ownership is gradually decreasing. Why own a car if you can order transport when you need it with a simple click? Why buy a dress for festivities that may be used only once or twice? Why not rent out vacant rooms in the apartment? While there are already incentives to utilize resources more efficiently, lower transaction costs will make them even stronger.

We identify several different effects of the gig economy on the possibilities for taxation. Reduced need for ownership implies a corresponding lower level of production to support demand – and thus less taxes paid by companies. For example, the tax revenue from a car sale is changed to the income from leasing a car or using a carpool. This can mean lower total consumption and/or redistribution to other consumption. Consumers have more income in their pockets that they spend on other goods and services, such as travel. The net effect of the changes is ambiguous and depends on exactly how much is redistributed and to which tax bases.

What is clearer, however, is the effect of a shift from regular employment to gig work on labour income taxes, since the latter is taxed at a much lower level in virtually all countries. It can result in lower tax revenues and also give rise to social tensions from increased differences in benefits and wage income. According to an OECD study, there is a particularly large difference in taxes paid between traditional workers and gig workers in the Netherlands and the UK.[50] In the Netherlands, the difference between employment and gig work can amount to almost 30 percentage points, depending on the exact location in the tax bracket.

[49] Konrad (2016).

[50] Milanez and Bratta (2019).

This difference creates strong motivation to hire gig workers instead of regular employees. The Netherlands and the UK also show significant increases in the proportion of gig workers/self-employed, while the share in Sweden, for example, remains stable. In countries with a large tax wedge between different forms of work, there is a push towards forms that have lower taxes, which would reduce tax revenues.

Gig work across borders is also growing. This creates problems for tax authorities as it is difficult to tax. For example, take the freelance platform *Upwork*, which has more than 12 million gig workers around the world but is controlled from Silicon Valley.[51] When *Upwork* has freelancers working in one country, for a customer in another country, and has headquarters in a third, it becomes difficult for authorities to discover or tax the transaction. Certain steps have certainly been taken to reduce the problem of tax evasion in Europe. For example, *Ube*r has been working on introducing technology that will automatically report travel income to the tax authority, and the EU is discussing various initiatives. It remains to be seen whether these initiatives are sufficient.

7. Erosion of tax bases should be taken more seriously

Taxes fund the public sector and the welfare state, but they are also used to achieve a multitude of other political objectives. Among these are the promotion of economic growth, the reduction of harmful environmental effects, the increase in the cost of unhealthful goods (tobacco and alcohol), and the redistribution of income.

The possibility of achieving these goals, as well as the political considerations that must be reckoned with, are increasingly being reshaped by technology. More specifically, digitalization is changing major parts of the economy and thereby affecting the conditions for a well-functioning tax system. The tax system is at risk of losing its legitimacy unless it can adapt to the changing technological landscape. Several important tax bases have become more mobile, which could erode total tax revenues and impair the preconditions for growth.

It goes without saying that digitalization does *not* mean the end of taxation. Ministries of finance around the world still have any number of tools in their arsenal, such as property and capital taxes, VAT, and excise duties. A factor that might strengthen tax authorities is their increased cooperation both inside and outside the EU, not least through new agreements on information exchange. Cooperation will lessen the possibility of tax avoidance and the problem of double taxation, which can strengthen the legitimacy and effectiveness of the tax system. In this context, the EU is an important force for finding solutions in OECD/BEPS, where many countries outside Europe are also included.

Productivity growth has been low despite rapid technological developments. Often, it takes time for new technologies and work processes to fully break through. However, if – or when – GDP growth regains its momentum, it is far from clear that increased GDP growth can compensate for the factors that weaken opportunities for taxation, given existing regulations or tax rates. In this paper, we have argued that digitalization is a lever that strengthens existing forces that make operational efficiency more difficult for tax authorities – and ultimately for politicians. Forces that drive the erosion of tax bases are:

- Increased automation and gig services erode taxes on work, the government's most important tax base. Jobs are not disappearing, but the wage share of GDP has declined and thus gradually reduced the basis for tax on work. The effects are likely to be

[51] Sundararajan (2017).

greatest in countries with high welfare ambitions, which often impose high labour taxes.

- Incentives to work as well as to enter secondary or tertiary education are dampened by high taxes on income and marginal taxes and by the fact that it is becoming "cheaper" to enjoy leisure time with digital services. Many such services, such as games or search engines, can be used at little or no cost. Free of charge digital services also do not generate any VAT revenue, and instead constitute a form of transaction where payment is instead made by sharing personal data.

- Corporate tax is also an important tax base, but technological advances give multinational companies greater opportunities to plan their activities to minimize their tax burden. The OECD estimates that tax planning globally leads to approximately USD 100–240 billion in missing tax revenue per year.

The arguments that tax bases are about to erode are largely qualitative. Ideally, we should be able to quantify the effects and indicate the orders of magnitude at stake. Although digitalization fundamentally shifts key factors in the underlying economy, the tax effects of digitalization have only received scant attention in the economics literature. Instead, it is international organizations such as the OECD, the European Commission, and the IMF that provide important analysis and policy input, as well as legal research. It is important that more academic researchers in economics begin to address the issue of eroding tax bases and to analyse the tax reforms that eventually will become necessary.

It is difficult to assess how fast tax bases will erode. However, it is clear that the ability to shift factors of production continues to increase. More and more, capital is used instead of labour and high-paid work in advanced countries can be outsourced to lower-paid work in other parts of the world.

What should *not* be done? Many proposals have been discussed. For example, Bill Gates, the founder of Microsoft, has proposed a robot tax as a way to tax digital companies, with the particular aim to slow down the automation of human work. One problem with such a tax is that it is difficult to distinguish between technologies that facilitate human work, on the one hand, and those that replace jobs, on the other hand. There is a clear risk that the Gates proposal becomes a tax on innovation and technological progress.

The work of the OECD within the BEPS framework shows a more promising way forward. The agreement from October 2019 lays out principles for corporate taxation in the future. If implemented, it will be the largest reform of the international tax system since the 1920s. It has the potential to make the tax system more efficient and equitable. If the negotiations break down and nation-states go separate ways, however, we instead risk increased complexity, fragmentation, and investment uncertainty. Already a number of countries, including France and some other EU member states, have implemented—or plan to implement—a digital tax. If coordination is not restored in the EU, investment uncertainty will increase. This presents a larger obstacle for start-ups and small companies when they plan ahead. They are also less able to counter the effects of tax changes compared to multinationals, since the margins for unforeseen events tend to be slimmer.

8. Policy conclusions

What might happen if these efforts toward tax reform drag out over time or fail to materialise? As the possibilities for substituting capital for labour increase, the distortionary effects of tax wedges may be further exacerbated. This could lessen incentives to work and hamper

productivity growth in the long term. Improvements in growth and welfare may hinge on the absence of such negative effects. The experience of structural change after the industrial revolution was that knowledge and skills became crucial to boost productivity, which in turn strengthened wage growth in the labour market. Labour market institutions must support such a development in our times, by promoting education and life-long learning.

An important part of a tax reform is thus to support people's abilities to adapt and develop new skills in times of rapid technological change. The EU has an important role to play as interlocutor in the international discussions within the OECD/BEPS, and in coordinating and supporting national reform efforts. The EU should urge its member states to address these issues more directly. The work done by the international community in formulating the new principles for corporate taxation constitutes a significant step, but the focus should also be on domestic tax systems. National policy agendas should pay heed to the changes brought by technological developments that have made factors of production—and thus tax bases—more fluid and mobile. This alters the trade-offs that politicians need to weigh against one another. The countries with high taxes on labour are especially vulnerable in this regard, which may risk resulting in lower total tax revenue and lower incentives for education and training. When AI and automation come in force, it is important that the tax system does not become a stumbling block for people to adapt, but instead supports the necessary structural change and thus improves the outlook for growth and welfare. To ensure we get *money for somethin*', we conclude that a new comprehensive tax reform is urgent.

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