

DISCUSSION

// NO.19-010 | 04/2019

# DISCUSSION PAPER

// MARCEL OLBERT AND CHRISTOPH SPENGLER

## Taxation in the Digital Economy – Recent Policy Developments and the Question of Value Creation

# Taxation in the Digital Economy

## – Recent Policy Developments and the Question of Value Creation\*

Marcel Olbert

University of Mannheim

Christoph Spengel

University of Mannheim & ZEW

March 2019

### **Abstract**

The paper reviews the evidence on the challenges of digitalization for direct (corporate profit) and indirect (consumption) taxation. Based on both anecdotal and empirical evidence, we evaluate ongoing developments at the OECD and European Union level and argue that there is no justification for introducing a new tax order for digital businesses. In particular, the significant digital presence and the digital services tax as put forward by the European Commission will most likely distort corporate decisions and spur tax competition. To contribute to the development of tax rules in line with value creation as the gold standard for profit taxation the paper discusses data as a “new” value-driving asset in the digital economy. It draws on insights from interdisciplinary research to highlight that the value of data emerges through proprietary activities conducted within businesses. We ultimately discuss how existing transfer pricing solutions can be adapted to business models employing data mining.

**JEL Classifications:** H20, H25, H26, L21, L86, M14

**Keywords:** Digital Economy, Corporate Taxation, Business Model Analysis, Data Mining, Tax Planning

---

\*The authors gratefully acknowledge the support from the Leibniz ScienceCampus MaTax and the Leibniz Collaborative Excellence grant “Taxation in the Era of Digital Transformation”.

## 1. Introduction

Digitalization has become the leading phenomenon in today's world since the industrial revolution. Scholars, politicians, and businesses uniformly agree that the digitalization of both the society and the economy poses several challenges to the international business tax framework. Most economists and supranational organizations add optimistic predictions of future economic growth, innovation, and societal change to the first statement on digitalization (Brynjolfsson and McAfee 2017; Brynjolfsson and Mitchell 2017; OECD 2016, 2017b). With regard to taxation, however, considerable controversy in the tax community prevails. The inherent discussion is recently gaining momentum and importance since the publications of the OECD's interim report on the tax challenges arising from digitalization (OECD 2018b) and the European Commission's proposals on new tax rules targeting digital firms (European Commission 2018c, 2018b). In this paper, we review the academic evidence on the tax challenges of digitalization and critically assess current reform proposals against the background of this (lacking) evidence and the economic consequences of digitalization. We further discuss how to reach the often-cited goal of aligning taxation with value creation in a pragmatic and timely manner.

An abundant literature on international taxation in the digital economy has emerged since the OECD's Action Plan on BEPS (OECD 2013), and even more publications build on and criticize these articles and the OECD's work published in the OECD's 2015 Final Report "Addressing the Tax Challenges of the Digital Economy" (OECD 2015a). It is neither the aim nor within the scope of this article to provide a comprehensive overview.<sup>1</sup> However, we note that there is no in-depth analysis of what the current tax challenges are and that no scientific evidence exists for the asserted flaws in the existing tax system (Schoen 2018).<sup>2</sup> We therefore take one step back and ask what exactly the tax challenges in the digital economy are. Based on empirical evidence, we show that both policymakers and research neglect well-known and considerable enforcement issues in indirect taxation (i.e., VAT in Europe) and that profit shifting might be, but is not necessarily, a particular concern of digital businesses. We further highlight that firms may optimize their tax position by making real business decisions (i.e., relocating investment)

---

<sup>1</sup> See Olbert and Spengel (2017) for a review of articles published until early 2017.

<sup>2</sup> Different scholarly proposals take on a paramount view in that the current tax system, in general, is unable to solve the challenges of the digital economy and that a fundamental tax reform is needed, e.g., Hongler and Pistone (2015), Brauner and Baez Moreno (2015), Devereux and Vella (2017), Schreiber and Fell (2017), Schoen (2018). Fundamental reform options might solve existing problems in theory but also raise – again in theory – new questions concerning taxing the digital economy (Devereux and Vella 2018). Given that such far-reaching options for reform are unlikely to be adapted in the mid-term and that their justification is not self-evident (Schoen 2018), this paper does not discuss these approaches in detail. It rather focuses on the recent developments at the level of the OECD and the European Commission.

– a behavior aimed at maximizing firm value (Endres and Spengel 2015; Scholes et al. 2015) and incentivized by international tax competition (Devereux, Lockwood, and Redoano 2008; Devereux and Vella 2018). While this phenomenon should not be labelled as aggressive tax planning, it might be of particular relevance in the digital economy in which countries’ tax codes differ substantially in their attractiveness for investments in digital business models (Spengel et al. 2017)<sup>3</sup>.

In light of these insights, we welcome the OECD’s endeavor to avoid any tax-related ring-fencing of digital firms and, instead, develop guidelines within the existing tax framework based on global coordination. By contrast, the European Commission’s proposed interim solution in the form of a Digital Services Tax (DST) is clearly ring-fencing, bears a substantial risk of double taxation and legal uncertainty, and most likely, does not justify its administrative costs. Similarly, the proposed comprehensive long-term solution – a Significant Digital Presence (SDP) – will ring-fence important business models given the arbitrary thresholds for its application. Taken together, both EC proposals would likely result in limited additional tax revenue collected from a few firms at the cost of increasing tax competition and economic distortions instead of leveraging the potential benefits of additional investments in digital business models within the European Union.

We finally discuss a potential conceptual consensus on taxing digital businesses with a particular focus on data as a value driver. We thereby aim to shed some light on a heated but largely unfounded debate on whether and how firms’ use of data should be taxed. We intend to provide an intuitive and scientifically founded approach to conceptualize value creation within the existing tax framework. Based on our earlier discussion (Olbert and Spengel 2017), we argue that traditional businesses (currently considered non-digital) are increasingly adopting digital business models, too, rendering any proposals including ring-fencing elements pointless. We use the example of data mining as a versatile business model to show that prevailing transfer pricing solutions exist and that the mere collection of raw data should not trigger any profit taxation unless policymakers are willing to fundamentally review the justification of taxing rights. We do not claim to provide a final answer to the (direct) tax challenges of the digital economy. We rather highlight the need for further (empirical) research and offer some food for thought within the ongoing policy discussion.

This paper proceeds as follows. Section 2 briefly reviews the evidence on the tax challenges of digitalization covering direct and indirect taxes, and it distinguishes between anecdotal and

---

<sup>3</sup> For the interpretation of the analytical results, see also <https://www.pwc.com/us/en/press-releases/2018/understanding-the-zew-pwc-report.html>.

empirical evidence. Section 3 evaluates ongoing developments at the OECD and European Union level. Section 4 provides a discussion of value creation as the gold standard for profit taxation with data as a “new” value-driving asset in the digital economy. We highlight the value of data, draw on insights from interdisciplinary research, and show how existing transfer pricing solutions can be adapted to business models employing data mining. Section 5 concludes.

## **2. What do we know about the tax challenges of digitalization?**

### **2.1. Direct vs. indirect taxation**

In its final report on “Addressing the Tax Challenges of the Digital Economy” in 2015, the OECD acknowledges that challenges arise in both direct and indirect taxation (OECD 2015). There seem to be two major challenges in collecting direct taxes, in particular corporate income taxes. First, digital firms are able to access foreign markets without incurring a taxable nexus according to prevailing, traditional standards (e.g., by a local subsidiary or sufficient physical presence to establish a permanent establishment (PE)). Second, digital firms presumably engage in more aggressive profit shifting activities since they rely on mobile and intangible assets to a greater extent than traditional firms. As a result, the report identifies BEPS to be *exacerbated*. The major indirect tax challenge is that highly digitalized businesses are able to locate their point of sales in low-tax consumption jurisdictions to minimize their VAT<sup>4</sup> (or GST) whenever consumption taxes are levied based on the origin principle, i.e., the tax liability arises in the country where the provider of digital services or goods is located.

The current public debate largely concentrates on the issue of profit shifting and a fair share of (direct) income taxation in the market location although empirical estimates point towards a relatively low income-tax sensitivity of profits reported by multinational firms in developed countries (Dharmapala 2014). As the OECD notes in its report on BEPS Action 11 (Measuring and Monitoring BEPS (OECD 2015b)) and recent evidence by Torslv et al. (2018) suggests, these empirical results might understate the true economic magnitude of tax-motivated profit shifting which is inherently hard to measure. With respect to indirect taxation, in contrast, it is evident that billions of revenue are at stake when (not) collecting consumption taxes (e.g., the estimated VAT gap amounts to over EUR 150 billion in the EU in 2015 (CASE and IHS 2017; European Commission 2016b)). Therefore, the question remains why the European Commission does not address consumption taxes in its current policy proposals. In its 2018 interim report,

---

<sup>4</sup> VAT refers to value-added taxes as levied in the European Union. Similarly, other countries face challenges to enforce other types of consumption taxes such as general sales taxes (GST) in the US. General sales taxes only apply to final sales made by vendors to (private) customers and are typically levied where customers are located if vendors have a taxable nexus at this location.

the OECD claims that many member states have successfully addressed these challenges by implementing the destination principle for B2B services (chapters 3.2 and 3.4 of the revised OECD International VAT/GST Guidelines (OECD 2017a)) and for B2C services (accompanied by a simplified registration system) as evidenced by increasing VAT revenues (OECD 2018b).<sup>5</sup> Rising consumption tax revenues, however, might also be a consequence of the general economic conditions or improved enforcement in non-digital sectors (CASE and IHS 2017) and we lack evidence whether (digital) consumption taxes affect corporate decisions of (digital) firms (Jacob, Michaely, and Müller 2018; Olbert and Werner 2018).

In a recent working paper, Olbert and Werner (2018) find that digital firms in the service sector significantly decrease (increase) reported sales in the country of their incorporation in response to VAT rate increases (cuts) between 2007 and 2015. Assuming the location of a multinational group's subsidiaries (firms) is fixed and independent of VAT changes, this evidence is consistent with firms channeling sales of digital services and goods through locations with lower VAT rates. In its strategy on the Digital Single Market the European Commission has acknowledged that a consumption tax system with low compliance costs and no discrimination based on the location of vendors or consumers is indispensable to avoid economic distortions in the digital economy (European Commission 2016a). Indeed, Hoopes, Thornock, and Williams (2016) show that circumventing sales taxes in the US provides a competitive advantage of e-commerce sellers and the evidence in Olbert and Werner (2018) highlights that digital firms are particularly sensitive to VAT rates (holding other macroeconomic factors constant). Consumption taxes or more general forms of destination-based taxes are typically justified by the existence of a market's demand side (Devereux and Vella 2017; Schoen 2018). Consequently, the enforcement of the destination principle is not only key to restoring uncollected consumption tax revenue, but should also be considered in the discussion of reforming corporate income taxation. If the destination principle is successfully implemented for digital transactions, jurisdictions in which digital providers have no nexus for income taxation are compensated for providing a consumer market. We therefore encourage researchers and policymakers to focus on the role of consumption taxes (i.e., VAT in the EU) in the digital economy from two perspectives: as a tax that affects corporate decisions and as a tax that contributes to collecting a fair share of revenue in market countries.

---

<sup>5</sup> E.g., EUR 3 billion collected through the EU's MOSS regime in the first year of adoption (2015) or ZAR 585 million in South Africa after applying a similar principle recommended by the OECD in 2016/2017.

## 2.2. Real decisions vs. tax avoidance

The OECD states that *current international tax standards may not have kept pace with changes in global business practices, in particular in the area of intangibles and the development of the digital economy* (OECD 2013, 2015, 2018). While the current policy debate definitely points at several fundamental weaknesses of the current system for taxing businesses in the digital economy (e.g., Devereux and Vella 2017), the overall concern lies with (corporate) taxpayers' behavior as to minimize their taxes. Minimizing (corporate) taxes, often labelled tax avoidance in the literature, is the result of any transaction that has an effect on a firm's explicit tax liability (Hanlon and Heitzman 2010). Abstracting from any illegal behavior (e.g., non-compliant sheltering), such tax planning activities range from real activities that are tax favored (i.e., investing in a low-tax country or low-taxed asset) to more artificial activities specifically targeted to minimize taxes (e.g., treaty shopping through holding companies).

We argue that it is important to distinguish between real activities and “pure formal”, legally structured tax planning activities when evaluating current policy, corporate behavior, and reform proposals. A recent study examines the costs of capital for effective marginal and average tax rates (EATRs) for profitable hypothetical investments in digital business models (Spengel et al. 2017). The study builds on a neoclassical model adapted from Devereux and Griffith (1998) and compares the effective tax burdens of marginal and profitable investments in assets of traditional business models (machinery, industrial buildings, inventory, financial assets, acquired IP) with those of investments in digital business models (self-developed and acquired software, IT hardware, self-developed and acquired IP). Ireland as a commonly labelled tax haven for multinational firms and also Italy<sup>6</sup> stand out as very attractive locations for real investments in digital business models, while Germany, France, Japan, and the US (before the 2017 enactment of tax reform) rank last. The primary drivers of these results are the following. (i) Investment costs of digital business models can typically be immediately expensed (e.g., personnel expense in the course of data mining or software development); (ii) fixed asset investments of digital businesses such as acquired software typically face more generous depreciation rates than traditional assets such as plant or machinery; and (iii) special provisions such as bonus/hyper deductions for high-tech investments (e.g., in Italy), R&D tax credits (e.g., in Austria), and IP box regimes favor digital business models to a substantially greater extent than traditional businesses.

---

<sup>6</sup> The study only considers factors of direct taxation (i.e., tax rates and rules determining the corporate income tax base). New tax rules targeting turnover of firms in the digital economy such as the 3% “web tax” on digital transactions such as in Italy might have adverse effects on a country's attractiveness for digital companies.

Companies investing in digital technologies and business models considering these tax factors when deciding about locating their investments will optimize their direct tax burden which is a cost to the business (Scholes et al. 2015). Companies making such real decisions should thus not be blamed for being overly tax aggressive if their reported tax liabilities experience a downward trend. In contrast, it is obvious that policymakers intend companies to make such decisions since FDI in general and investments in digital technologies are expected to spur economic growth and increase employment rates. For instance, the Irish government and the Italian government offer tax incentives of around EUR 13 billion to stimulate investment in digital industrial platform actions (Irish Department of Finance 2018; Lazaro 2017).

If companies engage in particularly aggressive BEPS, such behavior should be combatted with anti-avoidance measures because, in contrast to real decisions in response to tax incentive stemming from countries' tax competition, such BEPS undermines the concept of taxing economic rents. Respective legislation has been developed over the past decades and is being implemented in domestic tax law following the BEPS action plan and the European Commission's ATAD directive (Council of the European Union 2016). Yet, such aggressive tax planning is not particular to the digital economy<sup>7</sup> and the respective measures should apply equally to all sectors of the economy. If policymakers, however, are concerned that little or no taxable profits of digital business models are allocated to countries in which they access consumer markets but have not invested in such a manner that a taxable presence under current legislation exists, one should carefully evaluate the current framework (see section 4) (Devereux and Vella 2018).

### **2.3. Anecdotal vs. empirical evidence of BEPS**

As noted in the media and some scholarly articles (Dharmapala 2014; Economist 2016), there are prominent examples of multinational companies with digital business models paying little taxes in countries with large markets and reporting relatively low global ETRs. This anecdotal evidence has been a driving force of the debate and policy work on BEPS. An often-neglected fact is that similar anecdotal evidence exists for purely non-digital companies that sell, for instance, hardware, construction equipment, or food. One might argue that some of these firms rely on intangible assets such as their brand and that internet (platform) technologies contribute to brand value. Yet, enough anecdotes on firms obviously considered as part of the traditional economy exist. Thus, such anecdotes cannot serve as a justification for new tax rules for the digital economy itself. However, they suggest that the application of profit allocation rules and

---

<sup>7</sup> The consensus in the literature seems to be in line with the OECD's statement that the problem is rather exacerbated in the digital economy.

respective anti-avoidance legislation is unsatisfactory if such tax structures are considered a BEPS issue.

Empirical evidence on the tax challenges in the digital economy, to the best of our knowledge, is very scarce. It is well documented that companies strategically locate intangible assets such as valuable patents (Dischinger and Riedel 2011; Ernst, Richter, and Riedel 2014; Griffith, Miller, and O’Connell 2014) and trademarks (Heckemeyer, Olligs, and Overesch 2018) in low-tax jurisdictions. The common understanding is that digital businesses heavily rely on intangibles throughout their value chain (OECD 2015). Yet, these intangibles often differ from those reported in financial statements or measured in patent and trademark statistics and can take the form of organizational capital, self-developed software and platforms, and processed data, among others (Brynjolfsson and McAfee 2014; El Sawy and Pereiry 2013). Klassen et al. (2014) provide a theoretical model and some consistent empirical evidence that e-commerce decreases the cost of income shifting and enables US MNCs to lower their reported GAAP effective tax rates. Apart from that, we know nothing about particularly aggressive income shifting in the digital economy, i.e., whether firms strategically use the above-mentioned intangible assets to facilitate income tax planning.<sup>8</sup>

### **3. A brief review of recent policy developments**

#### **3.1. OECD BEPS Action 1**

On 16 March 2018, the OECD published the details “Tax Challenges Arising from Digitalisation – Interim Report 2018” (OECD 2018b) as part of its work on Action 1 of its Action Plan on BEPS. While labelled “interim,” this report builds on the 2015 “final” report on addressing the tax challenges (OECD 2015)<sup>9</sup> and provides a much more detailed analysis of the characteristics of the digital economy and digital business models and a more critical discussion of potential solutions to address the tax challenges.<sup>10</sup>

In the interim report, the OECD devotes one entire chapter (2) to the main features of certain highly digitalized business models and the notion of value creation. In particular, the OECD offers a first attempt to substantiate the term “value creation” by distinguishing between three types of digital value creation and by providing several case studies: Through (1) value chains, high-technology companies create value by converting inputs into outputs via discrete and sequential but interrelated activities. Yet, more digitalized companies are supposed to operate

---

<sup>8</sup> Olbert and Werner (2018) find only limited evidence of a stronger tax sensitivity of pre-tax earnings for digital firms in the European service sector.

<sup>9</sup> For a detailed review of the 2015 final report, see Olbert and Spengel (2017).

<sup>10</sup> For a condensed summary, see EY (2018).

through multi-sided (2) value networks in which mediating technologies (e.g., a software interface) are used by platform firms to link users (i.e., customers) to engage in transactions. In one-sided markets, companies employ (3) value shops to serve one specific type of user or customer with a technology-intensive application. Based on this business model analysis, the OECD stresses that the main characteristics of digital business models are scale without mass (low marginal costs of serving a large number of customers), reliance on intangible assets, and the collection of data from user participation.

With regard to potential (new) approaches to taxing digital business models, the OECD considers the implementation and the impact of the BEPS package and reviews domestic interim measures. The review covers (1) alternative PE thresholds as adapted in Israel and India, (2) additional withholding taxes, (3) turnover taxes as Italy's levy on digital transactions, and (4) specific regimes targeted at large firms, namely the Diverted Profits Tax in the UK or the recent BEAT provisions of the 2017 US tax reform. However, the OECD did not recommend any of these or any other targeted measures as interim solutions. Instead, the OECD concludes that there is no possibility to ring-fence the digital economy and that member countries currently do not reach any consensus such that further consideration is needed. The OECD seems to favor the revision and adaptation of the current framework with a particular focus on nexus and profit allocation. Importantly, the OECD stresses that if, however, national governments decide to pursue interim measures, such rules should comply with international standards and trade obligations, be temporary and targeted, and minimize the impact on start-up companies and administrative burdens. An update on the OECD's work should be expected in 2019 with the aim of reaching a consensus-based solution by 2020.

### **3.2. Proposed Council Directives by the European Commission**

After the report of the EU High Level Expert Group in 2014 that supported the development of ideas to tax digital businesses on a destination basis (European Commission 2014; Olbert and Spengel 2017), the European Commission went further than the OECD and issued two draft Council Directives on 21 March 2018: (1) Taxation of profits based on a corporation's Significant Digital Presence (SDP) and (2) a common system for a Digital Services Tax (DST).<sup>11</sup> While the latter (2) option should serve as an interim solution until definite rules on the first (1) option can be established as a comprehensive solution, both proposals ultimately aim at the attribution of taxing rights to the jurisdiction where users are located. The European

---

<sup>11</sup> For a more detailed overview and a preliminary discussion, see Petruzzi and Koukouloti (2018) and Sheppard (2018).

Commission asks EU member states to adopt the proposals into domestic law by 31 December 2019.

The SDP (1) defines criteria of a “digital footprint” of a business in a jurisdiction which is deemed to exist if (i) annual revenue from the provision of digital services to users amounts to at least EUR 7 million, (ii) at least 100,000 users are served, or (iii) 3,000 business contracts with users are concluded in a fiscal year. It further covers the attribution of profits based on economically significant activities related to data and users. Here, the SDP would constitute a hypothetical separate enterprise and the traditional functional analysis would be conducted to attribute profits according to the OECD transfer pricing guidelines. When profits must be allocated among different entities (and countries), the EC essentially mandates the use of the profit-split method if the taxpayer does not prove that some other transfer pricing method is more appropriate (Sheppard 2018). Proposed splitting factors are R&D and marketing costs, the number of users, and data collected in each country, respectively.

The EC acknowledges that the proposal of the SDP lacks thorough elaboration in particular concerning the mechanism of allocating profits. As political action is desired, the DST is proposed as an intermediate, targeted solution (2). It prescribes a 3% levy on gross revenue (net of VAT and other taxes) resulting from the supply of advertising, intermediation, and transmission of data services. The tax should be collected in the country where the recipient of the service (i.e., the payer of the revenue) is located. The tax base is the sum of revenues only from placing advertisements on a digital interface targeted at users of that interface, offering a multi-sided digital interface where commercial and non-commercial users interact, and the transmission of data collected about users and generated from users’ activities on digital interfaces. The EC provides for a specific list of services exempt from the tax such as the direct provision or sale of online content (e.g., video streaming, downloadable software applications). The tax liability only arises if the taxpayer’s (group of affiliated entities) worldwide revenue exceeds EUR 750 million and the within-EU revenue exceeds EUR 50 million. While the collection of the tax is based on the origin of the revenue stream, the distribution of the tax revenues to countries follows allocation keys related to users’ activities which are mainly influenced by the number of users in a given country. The EC anticipates that the implementation and enforcement of such tax are difficult tasks for EU member states and therefore considers a one-stop shop solution similar to the newly established MOSS for the collection of VAT on electronic B2C services.

### 3.3. Critical Assessment

While the difficulty to reach consensus among member states and the conflicting interests between industrial countries and small and open economies might have influenced the major conclusions in the OECD's 2018 interim report, the report offers valuable advancements in the discussion of how to deal with new forms of value creation when taxing international business profits. The OECD offers a detailed business model analysis which is the first of its kind on the international policy level. Along the lines of Olbert and Spengel (2017), the OECD acknowledges that digital business models can and should be analyzed carefully to enable the revision and final application of existing guidelines. The OECD goes further and proposes to differentiate between value chains, value networks, and value shops. While practitioners and scholars in management science and economics might disagree with these concepts or might want to propose further criteria, we welcome such form of classification as it can be applied to businesses within a wide range of industries and degrees of vertical integration. Such concepts should not be viewed as mutually exclusive or only applicable to "purely" digital firms, but rather as additional frameworks for conducting a functional analysis according to the OECD transfer pricing guidelines.

The work on profit allocation is particularly relevant and should be prioritized over additional or revised nexus rules for two reasons. First, even if new forms of taxable nexus are established, the question of allocating profits resulting from a highly integrated, cross-border business is inevitable. Second, most digital businesses that are obviously targeted in the current policy discussions do have a salient taxable nexus in countries in which consumer markets are relatively large.<sup>12</sup> Thus, re-thinking the way profits are allocated might already address many of the perceived tax challenges. However, the re-thinking exercise is more demanding and requires more work than what has been published so far. While the OECD acknowledges in its 2015 report that the value of data in digital business models is directly reflected (or monetized) in local advertising revenue (OECD 2015), the 2018 report contains no specific indication on the role and value of data as an asset and any activities around the use of data for corporate tax purposes. The OECD also acknowledges that "none of the BEPS measures were conceived to clarify the possible treatment and relative value of data". We consider more detailed work on

---

<sup>12</sup> For instance, Facebook operates through a German subsidiary (Facebook Germany GmbH) that is registered in Hamburg. The company has offices in Hamburg and Berlin. Also, smaller and younger digital companies make physical investments in their important local markets. For example, the French company Payfit was founded in 2016 and employs a business model in the financial technology sector. It enables small and medium enterprises to easily and quickly pay their employees and operates through office locations in Cyprus, the UK, Gibraltar, France, Spain, Germany, and the United Kingdom. See <https://payfit.com/fr/>.

the tax treatment of data extremely important (and urgent). The collection, transformation, and use of data within business models (collectively called data mining) are becoming integral elements of the value chains of both purely digital and also previously physical (traditional) companies (see section 4.).

Both the media and scholars have perceived the EC's proposals on the SDP and the DST as a rushed and shortsighted attempt to gain momentum in the policy debate (Becker and English 2018; Bloomberg 2018). In particular, the DST has received the most direct criticism due to its potential to create additional (double) taxation and legal uncertainty for taxpayers, to clash with international trade regulation, and to be ring-fencing and distortive. Moreover, the DST would severely limit the flexibility of EU member states in terms of international tax competition (CFE Fiscal Committee 2018; Devereux and Vella 2018; van Horzen and van Esdonk 2018; Petruzzi and Koukouloti 2018; Sheppard 2018; Wissenschaftlicher Beirat beim Bundesfinanzministerium (The Advisory Board to the (German) Federal Ministry of Finance) 2018). We share this criticism and do not aim to provide a more detailed discussion of these critical points. The EC's proposals obviously depart from the current system and will raise new issues that the EC might still address or discuss in the near future.

Instead, we will discuss the presumptions taken by the EC against the background of the political goals as communicated together with the proposals for the two directives.<sup>13</sup> The EC states that there is a misalignment between taxation and the place of value creation. The two proposals are supposed to contribute to a "modern and stable tax framework which stimulates innovation", to a "solution which can ensure a fair and effective taxation", to "rules...that are fit for the characteristics of digital businesses", to making "sure that public finances ... are sustainable", and to "fight(ing) against aggressive tax planning". We identified six presumptions in the EC's communication, the proposed measures, and its impact assessment that and will briefly comment on these presumptions in the following.

1. Corporate tax rules are outdated

Undoubtedly, the current framework of international and domestic tax law in place dates back to a time in which the use of information technologies by most businesses was far from intense or sophisticated, if even existent. Since then, entirely new business models (and companies) have emerged and are still emerging. One can thus conclude that tax rules are outdated and that the time is right to re-think the current framework and existing rules (Devereux and Vella 2017).

---

<sup>13</sup> The respective documentation is available at [https://ec.europa.eu/taxation\\_customs/business/company-tax/fair-taxation-digital-economy\\_en](https://ec.europa.eu/taxation_customs/business/company-tax/fair-taxation-digital-economy_en).

Further, as the OECD discusses in chapter 7 of the 2018 interim report, digitalization might also bring opportunities for the administration and collection of corporate taxes.

## 2. Digital businesses are undertaxed

On its webpage, in its communication, and through other media channels, the EC prominently claims that digital businesses are undertaxed and refers to empirical results of a joint study of the Center for European Economic Research (ZEW), the University of Mannheim, and PwC (“Digital Tax Index 2017”, (Spengel et al. 2017)). We highlight that the Commission's statement that “companies with digital business models pay less than half the tax rate of businesses with traditional business models” is prone to misinterpretations.<sup>14</sup> Such real under-taxation, i.e., that some companies really “pay” less tax than they are supposed to, can be the result of aggressive tax planning (avoidance) strategies. However, the study by Spengel et al. (2017) measures average effective tax rates (AETRs) and the cost of capital for stylized marginal and profitable corporate investments in typical assets of digital business models. The quantification relies on a neoclassical investment model (Devereux and Griffith 1998, 1999, 2003) and incorporates many relevant tax parameters that affect an investment in digital assets such as developed or acquired software in a given country. Investments in digital business models, on average, face lower average effective tax rates (and costs of capital) since more favorable depreciation rates typically apply to software and information technologies (compared to industrial buildings and machinery) and digital business models benefit to a greater extent from special incentives such as R&D credits and IP box regimes.<sup>15</sup> Overall, the numbers refer to effective tax burdens of stylized investments and not to any payments made by real-life corporations. By contrast, there is no empirical evidence that digital firms pay systematically less taxes than traditional firms (Bauer 2018). Thus, corresponding public statements should be made with the right amount of care.

## 3. A pre-specified amount of revenue, number of customers, and number of concluded contracts are valid criteria to determine a significant digital presence

Specifying quantitative thresholds for the applicability of rules is always, at least to some extent, arbitrary. For instance, there is no theoretical argument why firms with exactly EUR 750 million should provide Country-by-Country Reporting and firms with EUR 749 million should not or why the threshold for deductible interest according to the ATAD is exactly 30% of EBITDA and not 20% or 40%. However, such thresholds are imperfect remedies with an underlying

---

<sup>14</sup> See also <https://www.pwc.com/us/en/press-releases/2018/understanding-the-zew-pwc-report.html>.

<sup>15</sup> The European Commission acknowledges this result in its impact assessment of the proposed directives, accordingly (European Commission 2018a).

justification given the legal purpose of the rule. With regards to the SDP, justifying quantitative criteria at all is problematic. Digital business models are unique as evidenced by the challenge to identify and quantify so-called hard-to-value intangibles and the emergence of monopoly power and network effects (OECD 2015). As a result, different digital business models have different forms of generating revenue, interacting with users, and concluding contracts. In particular, the proposed criteria assume the importance of users and concluded contracts to be homogenous. For example, a highly specialized B2B digital services provider<sup>16</sup> might provide a platform with only a few hundred users and might conclude only a few but economically large contracts with its customers. To generate the same amount of revenue, a digital services provider that offers a platform with both B2C and B2B applications such as a professional social media platform, interacts with millions of customers and concludes a massive number of small-scale contracts.

4. The DST applies where largest gap between value creation and the ability to tax exists

The EC labels the digital services tax as the interim solution that “focuses on activities where there is a large gap between the value created and member states’ ability to tax it – where user participation and user contribution play a central role in value creation.” Within the proposal, the EC provides a relatively clear-cut definition of what types of services the tax is levied (see section 3.2). However, there is no further description of the gap between value creation and the ability to tax profits and, in particular, no explanation why this gap is particularly large with respect to companies that offer services falling under the scope of the DST as opposed to services that are excluded from the scope of the DST, such as content streaming services. Thus, prominent firms offering these services such as Netflix, Soundcloud, and Amazon (with its respective services for video and music streaming) will not face such tax (Sheppard 2018). This suggests that there is no or no large gap between value creation and the ability to tax profits of these business models. These business models, however, produce streaming content based on a detailed analysis of large amounts of collected user data. For example, Netflix states “in the ordinary course of business and in particular in connection with content acquisition and merchandising our service to our members, we collect and utilize data supplied by our members” and “(...) laws that limit our ability to collect, transfer and use data, could have an adverse effect on our business.”<sup>17</sup> Further, these companies collect user data, offer their

---

<sup>16</sup> For instance, kloeckner.i offers tools and platforms with front to end digital solutions for the steel industry, <https://www.kloeckner-i.com/en/>.

<sup>17</sup> According to Netflix’s annual report for fiscal year 2018 (10k). Further, in the privacy statement, the company states that “For example, we use information to: (...) analyze and understand our audience, improve our service

streaming services, and have the potential to collect advertising revenue all around the globe without establishing a physical nexus. Against this background, it is at least questionable why the EC seems not to conclude that “user participation and user contribution play a central role in value creation” in these cases. This simple example shows that applying the DST only to arbitrarily selected firms engaged in online advertising and firms that have very salient multi-sided interfaces might not only ring-fence the digital from the traditional economy but might even cause further ring-fencing within the digital economy.

5. It is possible to distinguish between business models for which DST applies

Another implicit assumption within the proposal for a DST is that it is actually possible to distinguish between revenues for which the DST is supposed to apply and those that should not fall under the scope of the DST. In practice, however, the collection of the DST would often imply the differentiation between services offered by the same company. If all companies with total worldwide revenue exceeding EUR 750 million and revenue within the EU exceeding EUR 50 million are potentially liable to the DST, the business models of a wide range of companies both in the purely digital and also in the traditional sectors would have to be assessed in great detail. For example, Alphabet Inc.’s (i.e., Google’s) video and music platform YouTube allows users to stream online content for free or based on a subscription fee. Such services would be excluded from the DST (see above). However, the platform also connects private users with commercial users (e.g., music labels, broadcasters) and allows Alphabet to collect advertising revenue. Such services would clearly fall under the scope of the DST. An exemplary case in the (formerly) traditional automotive sector is the German car manufacturer BMW. Up to date, BMW generates its largest share of revenue by selling cars (i.e., a non-digital business model). However, BMW is currently promoting its Connected Drive applications that will be an increasingly important source of revenue. Customers pay for a subscription to BMW’s online platform and can then consume digital services on-demand. Such services cover content streaming but also other platform services that fall within the scope of the DST. Further, BMW connects private users with commercial users that can sell their services to BMW’s customers. Alphabet, BMW, and any other competitor with similar business models and of similar size fall within the size threshold of the DST and will need to carefully evaluate to what extent the DST could be levied on their services revenue. Even abstracting from the fact that the portfolio of services and the revenue mix of those companies will be rapidly changing in the future, the administrative burden and legal uncertainty will be immense for both taxpayers and authorities.

---

(including our user interface experiences) and optimize content selection, recommendation algorithms and delivery,” see <https://help.netflix.com/legal/privacy?locale=en&country=DE>.

## 6. It is “necessary to find a targeted, interim solution at the EU level”

The discussion of presumptions 1-5 stresses the notion that changing the tax regime by imposing new forms of taxes is not necessarily justified but might instead lead to new issues (Devereux and Vella 2018; Schoen 2018). Our practical examples and recent scholarly contributions highlight that both the DST and the SDP are clearly ring-fencing and potentially lead to economic distortions since companies might face double taxation, legal uncertainty, and increasing effective tax burdens. If the EC seriously strives to support European companies to flourish in the digital economy,<sup>18</sup> these approaches might counteract this overarching goal (Schoen 2018).

Further, it is doubtful whether the targeted interim solution (DST) actually contributes to sustainable public finances. The estimated additional revenue of EUR 5 billion constitutes an unweighted average of EUR 179 m per EU member state. Policymakers should carefully evaluate whether this figure has the potential to generate fairness and efficiency in the EU tax systems, protect the integrity and a proper functioning of the single market,<sup>19</sup> and outweigh the potential compliance costs as discussed in this article. In this vein, it is not surprising that several EU member states such as Scandinavian countries, Ireland, the UK and, most likely, Germany<sup>20</sup> are recently taking a more careful, if not reluctant, position. Given this development, the EC might focus on developing a comprehensive solution along the lines of the OECD instead since this approach has proven successful in other areas of the BEPS project.

## 4. Value creation in data-driven businesses

### 4.1. Conceptual consensus and ways forward

Research and macroeconomic statistics confirm that data is an increasingly important value driver. However, the views on what exactly the value of data is and how it should be treated for corporate income tax purposes are diverging and often premature.<sup>21</sup> In this section, we aim to highlight that the ways data contribute to value creation can differ widely across industries and businesses. We offer a conceptual approach to think about the data-driven value creation process within the tax policy debate. Such a conceptual approach could then help to assess

---

<sup>18</sup> EC, A fair and efficient tax system in the EU for the digital single market, 2017

<sup>19</sup> explanatory memorandum

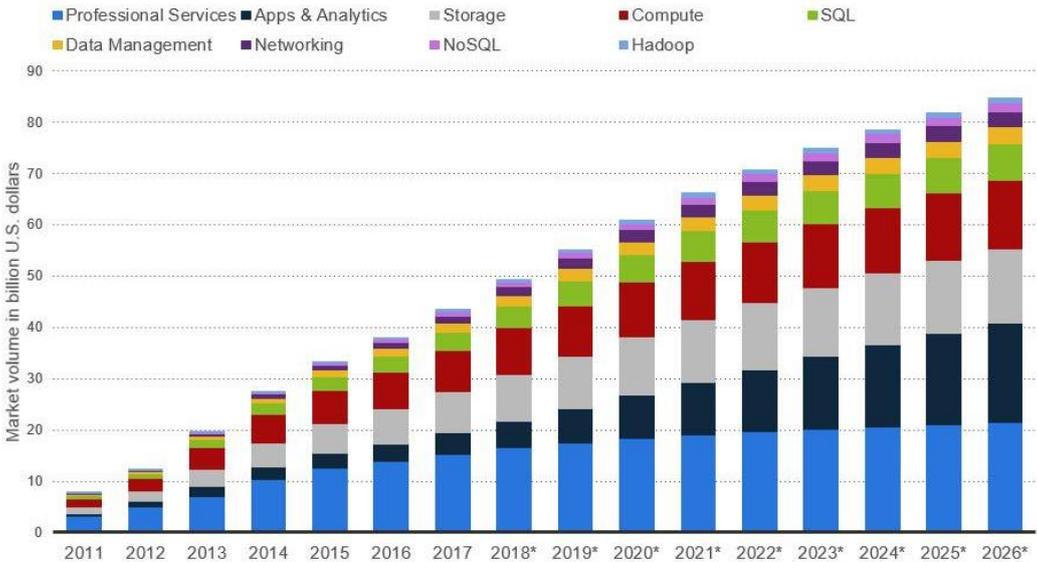
<sup>20</sup> See <https://www.irishtimes.com/business/economy/eu-finance-ministers-give-cool-reception-to-digital-tax-plan-1.3478055> and <https://www.welt.de/wirtschaft/article181433612/Internetkonzerne-Scholz-will-fiskalisches-Eigentor-bei-Digitalsteuer-verhindern.html>.

<sup>21</sup> For a detailed discussion, see (Olbert and Spengel 2017).

specific digital business models since they all rely on some form of value creation through the collection and use of data.

While businesses have always relied on some form of data, the ongoing discussion refers to businesses using large amounts of data that help to make better business decisions and shape entire business models. Such data is often labeled Big Data. To extract value from Big Data, businesses have to go through an “entire discovery process that requires insightful analysts, business users, and executives who ask the right questions, recognize patterns, make informed assumptions, and predict behavior” (Brynjolfsson and McAfee 2017; Oracle 2018). Figure 1 shows that the market for big data, i.e., investments, applications, and services related to this discovery process, is expected to grow steadily in the future and offers businesses great potential. In 2018, the global big data industry was expected to be worth more than USD 50 billion. Since the value of data, in general, can hardly be reflected in current accounting figures produced by businesses (Lev and Gu 2017),<sup>22</sup> we suggest to think about the specific investments and activities businesses conducted to create value with data. As recent research in innovation management confirms, it is not the quantity of (user) data but the quality of how such data is used to generate network effects that is crucial for value creation (Schrage 2016). While it might seem too superficial from a technical point of view, we refer to the phenomenon of data mining when analyzing these investments and activities in the next section.

**Big Data Market Forecast Worldwide from 2011 to 2026, by segment (in billion U.S. dollars)**



**Figure 1: Big Data Market Forecast Worldwide from 2011-2026, by segment (in USD billion), source: Statista<sup>23</sup>**

<sup>22</sup> <https://blogs.cfainstitute.org/investor/2018/04/18/assessing-value-in-the-digital-economy/>

<sup>23</sup> Available at <https://www.statista.com/statistics/255970/global-big-data-market-forecast-by-segment/>.

On the international tax policy level, it is widely acknowledged that the value of data should be considered when taxing business profits.<sup>24</sup> Put simply, there are two general options to adapt the tax system to reflect the value of data. First, one could acknowledge that it is impossible to correctly reflect the value of data (and other processes in digital business models) in the existing framework. Such acknowledgement would call for a fundamental tax reform with options ranging from a destination based cash flow to a residence based shareholder taxation as proposed by leading scholars (Devereux and Vella 2017; Schoen 2018). The merit of such reforms is that the tax base would depend on rather immobile factors limiting the potential of economic distortions, tax planning, and tax competition (Devereux and Vella 2018). Considering the need for international consensus and inherent political feasibility, a more promising approach in the near future would be the second option to further develop existing principles, i.e., allocating profits according to the arm's length principle based on the separate entity approach. A major task would first be to define the notion of value creation and then produce some clear guidance on how to allocate profits.<sup>25</sup>

In an earlier publication, we have suggested that a thorough analysis of digital business models based on interdisciplinary research and practical examples is both feasible and presents a promising starting point to adapt the existing tax framework concerning the allocation of profits (Olbert and Spengel 2017). Schoen (2018) further argues that such an approach helps to rethink the notion of taxable nexus in terms of where companies commit to digital investments. In general, digital business model analysis shows that digitalization produces intangibles that are not only quantifiable fixed assets but also involve process changes and “organizational inventions” (Brynjolfsson and McAfee 2014). Businesses create value along their entire value chain and information technologies are no longer supportive elements but integral parts of the value chain (Porter 1985, Amir and Zott 2011, OECD 2018b). In their recent work, Brynjolfsson and McAfee (2017) highlight that businesses can harness the forces of three new types of assets: machines (intelligent computers), platforms (business models using software interfaces), and crowds (high-scale access to information and users). They argue, however, that the respective counterparts of the old economy: mind (people), products (physical goods and services), and core (internal knowledge across the supply chain) are not obsolete. Instead, there is a common “need to rethink the balance” between these new and old assets in order to understand “when, where, how, and why machines, platform, and crowds can be effective (...)”. The World Bank estimates that 64% of the global wealth resided in human capital in 2014 (World Bank Group

---

<sup>24</sup> EU (2014), OECD (2015), OECD (2018), HM Treasury (2018).

<sup>25</sup> We acknowledge that the paradigm to tax business profits in line with value creation is not uncontested and no perfect solutions exist in theory (see, e.g., Devereux and Vella (2018) and Schoen (2018)).

2018). In today's increasingly digital economy, any efforts to design tax rules in line with value creation should thus center on the role (and location) of specific people functions in integrated, digital business models.

#### **4.2. An application: data mining**

During the rise of the digital economy, claims have been made that data contains value similar to valuable natural resources like oil. However, this analogy is flawed (Marr 2018, Goldfein and Nguyen 2018). Data only compounds in value if it is tied to a particular problem domain and solves problems for customers and businesses. In other words, data needs to be transformed by businesses that aim at value creation and this fact should be taken into account when thinking about corporate income taxation and data. Clearly, (raw) data is not comparable to oil.

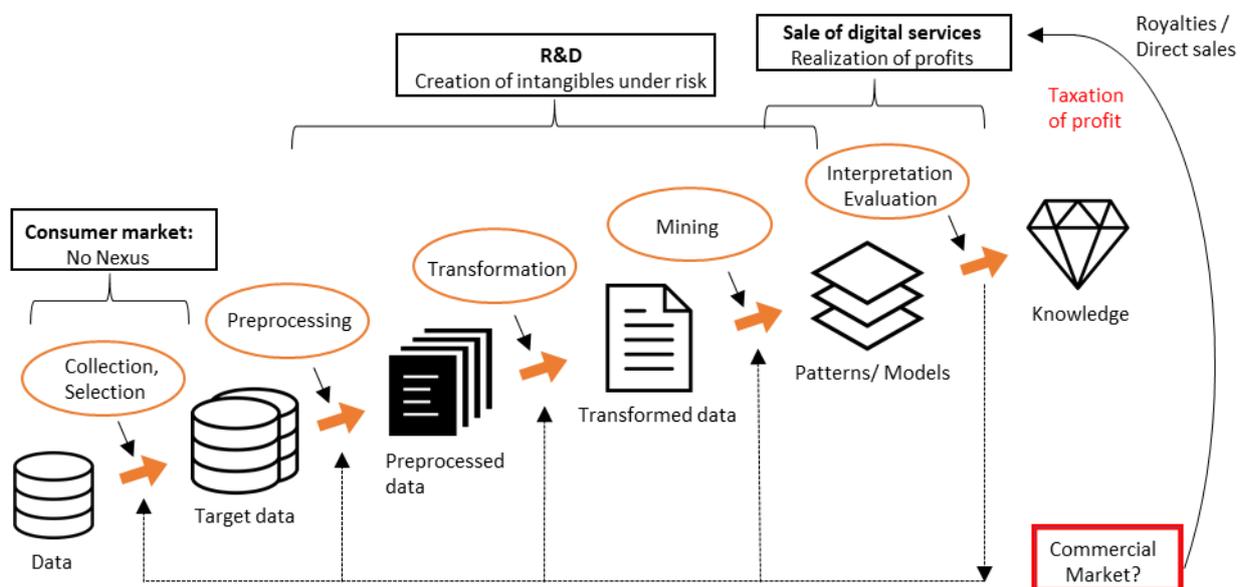
The concept of data mining refers to the techniques, methods, and algorithms to analyze large amounts of data with the ultimate goal to transform data into knowledge (Witten et al. 2017, Larose et al. 2014). When put into the context of a business model analysis, data mining can be considered as the part of a business model that creates value out of data. This notion is confirmed by practical and empirical evidence that companies invest in data mining with the ultimate purpose to increase their return on investment (Boire 2014). We aim to conceptualize the process of data mining that can be spread across different legal entities and functions of a globally operating company. While this approach does not provide a specific business model analysis of a single company, some form of data mining is inherent to any digital business model. It should thus be helpful to thinking about profit allocation for tax purposes in line with value creation in the digital economy. For example, many products of Alphabet Inc. directly rely on the data mining process, which does not necessarily involve the use of personal user data but involves every form of data that is generated by the use of Google's products and services.<sup>26</sup> Other data applications of companies offering physical goods or services are more subtle since the internal data mining process helps to develop these goods and services internally.<sup>27</sup>

---

<sup>26</sup> "A big challenge is in developing metrics, designing experimental methodologies, and modeling the space to create parsimonious representations that capture the fundamentals of the problem. These problems cut across Google's products and services, from designing experiments for testing new auction algorithms to developing automated metrics to measure the quality of a road map. Data mining lies at the heart of many of these questions, and the research done at Google is at the forefront of the field". See <https://ai.google/research/pubs?area=DataMiningandModeling>.

<sup>27</sup> For example, SAP's Netweaver Business Warehouse (based on the S4/Hana platform) helps industrial companies to manage and leverage their internal data to improve a diverse range of (non-digital) business models. See [https://help.sap.com/saphelp\\_erp60\\_sp/helpdata/de/4a/eb293b31de281de10000000a114084/content.htm](https://help.sap.com/saphelp_erp60_sp/helpdata/de/4a/eb293b31de281de10000000a114084/content.htm).

Figure 2 depicts the process of data mining with raw data located at the left end of the picture and valuable “knowledge” symbolized by a diamond at the right end. In a B2C business model, a company collects raw data from users located in their consumer market and finally uses the knowledge when deciding about what services to offer where and when and how to develop them. In a traditional, industrial business model, a company might collect raw data on its internal transactions (e.g., wear and tear, results of chemical reactions ) at a plant in a country where few other business functions are located and finally uses knowledge to improve and sell services in several foreign markets. The current political concern is that companies can collect raw data and later sell their services and products (leveraged by knowledge) without establishing a (physical) taxable nexus under existing rules in markets where data is collected. Profit taxation typically occurs where companies (report to) allocate knowledge as proxied by entrepreneurial functions (people, assets, risk).



**Figure 2: The process of Data Mining, source: own depiction<sup>28</sup>**

As the figure shows, value creation through data mining, however, requires several activities to transform raw data into valuable knowledge. First, a business has to decide upon data selection to extract target data from raw data. For instance, only some of the information gathered from consumers or transactions is relevant for creating future value. Then, this data must be processed and transformed into a format that is useful for the subsequent analysis. The next step involves data mining when defined more narrowly, i.e., a company’s data scientists that collaborate with managers at diverse business functions (Boire 2014, McKinsey Global Institute 2016, Witten

<sup>28</sup> Based on <https://www.researchgate.net/publication/324171539/download>. Icons taken from authors Freepik and Smashicons by flaticon.com.

et al. 2017) analyze the data to recognize patterns and models in the data. When these patterns are interpreted, the value is finally created for the business model.

Each digital business model and each traditional business model that gradually experiences a digital transformation is unique and, consequently, creates value through data mining in different ways. Also, a company might not engage in all steps of the outlined data mining process but either outsource some parts of it or, for example, monetize processed or transformed data by selling it to third parties that then engage in further data mining activities. Accordingly, different legal entities of the same company can be engaged in different steps of the data mining process.

The matrix in Figure 3 illustrates this argument. The upper horizontal axis summarizes the process of data mining as illustrated in Figure 2. Along this process, data gains in value. The vertical axis on the left categorizes different types of how businesses can use data to create value within their business models. Businesses might be involved in one or more data mining processes and use the data to generate revenue in different forms (“usage types”). For example, some data providers exclusively engage in collecting raw data and selling it to businesses that further transform and analyze this data. The international mass media and information firm Thomson Reuters, depicted on the bottom left, generates substantial revenue by collecting company data and macroeconomic data (mostly financial information) and then selling it to other parties that extract value from it (e.g., financial analysts or researchers). Other companies like Netflix (see above, here depicted in the middle on the top of the matrix) are internal users of data as they collect, select, and process data on its customers. Based on this internal data, Netflix improves and develops its service portfolio. Other businesses conduct more advanced data mining and use the valuable data (i.e., knowledge) internally or sell services or physical products based on the extracted value. For instance, the German engineering company Bosch covers the entire data mining process from collecting to interpreting the mined data and, based on the gained knowledge, offers a wide range of physical products. Its business customers in different industries use these products that are connected to Bosch’s internet of things platform.<sup>29</sup> Google, as noted earlier, offers a wide range of services and products that are created based on different processes of data mining, i.e., based on different levels of sophistication with respect to the data mining process. Another example is the financial services company Visa with its IntelliLink application. Visa also covers the entire data mining process and transforms

---

<sup>29</sup> See <https://www.bosch-si.com/iot-platform/bosch-iot-suite/homepage-bosch-iot-suite.html>.

its business clients' transactional data into valuable knowledge that clients pay for and use to make better business decisions.<sup>30</sup>



Figure 3: Categorization and examples of data mining business models

4.3. Leveraging data and digital business model analysis for transfer pricing

The challenge for allocating profits to legal entities within an integrated company according to the arm's length principle (and, presumably, in line with value creation) is to identify in what part of the data mining process a legal entity (i.e., taxpayer) is engaged. The next question is what is the value of the specific activities relative to the overall value created through data mining? This transfer pricing challenge could be addressed based on the conceptual analysis of the data mining process and the different business models that exist along the value chain of data mining.

Transfer pricing according to the arm's length principle relies on the comparability of controlled (intrafirm) transactions with third-party transactions (United Nations 2017, OECD 2017c). The very nature of intrafirm transactions often makes it impossible to find third market comparables (Keuschnigg and Devereux 2013) and this problem is obviously inherent to data-driven business models, too. We argue, however, that transfer pricing solutions can be developed for data-driven businesses similarly as for traditional business models because there exist (standalone) businesses that engage in specific activities of the data mining process.

To arrive at such a solution, common techniques of a functional analysis should identify the significant people functions involved and the investments made and risks assumed within the data mining process. Based on the above conceptual analysis of the data mining process, the

<sup>30</sup> See <https://usa.visa.com/run-your-business/commercial-solutions/solutions/intellilink.html>.

relative value contribution of the respective affiliated legal entities of an integrated firm in which such people functions and investments are located might then be identified by finding comparable functions and assets at standalone firms engaged in the same part of the data mining process.

For instance, proxies for the value of collected raw data can be derived from prices that companies focusing on data collection demand for their services. Such companies exist across many industries.<sup>31</sup> If an affiliate of a company running a digital platform is only concerned with collecting data in its specific market, and if this data is processed and analyzed in business functions at a different location, profits can be allocated to this affiliate based on available market prices. If, however, such an affiliate is also engaged in processing the data to contribute to the business' success (e.g., when software engineers are engaged in the R&D process), the identified market prices for the raw data can only be the lower bound for allocating profits. As a firm is involved in more activities towards the (valuable) part of the data mining process (towards the right on Figures 2 and 3), finding comparable transactions becomes a more complicated task. In such a situation, the profit split method should be considered to find consistent transfer pricing solutions.<sup>32</sup> The OECD's recent work on when and how to apply the profit split method and on revising the internationally accepted transfer pricing guidelines (OECD 2017c, 2018a) could build on these considerations to provide guidance as a comprehensive, consensus-based solution in a timely manner.

## **5. Conclusions**

Taxing digital businesses ranks high on the international policy agenda. The discussion on specific tax rules for the digital economy is gaining momentum since the release of the OECD's interim report on the tax challenges of digitalization and, more specifically, since the European Commission's publication of two draft Council Directives in March 2018. The OECD concludes that (yet to be reformed) tax rules should not depart from the existing framework and that further work on concepts of aligning taxation with value creation is necessary to arrive at internationally coordinated solutions. The European Commission, in contrast, proposes the Significant Digital Presence as a new taxable nexus in the digital economy and the Digital Services Tax as an interim solution to impose a levy on gross revenue from certain digital transactions.

---

<sup>31</sup> This market is also called Data as a Service ([https://www.idc.com/getdoc.jsp?containerId=IDC\\_P31301](https://www.idc.com/getdoc.jsp?containerId=IDC_P31301)). See, e.g., McKinsey Global Institutes (2016), <https://www.greenbook.org/market-research-firms/data-collection>.

<sup>32</sup> Evidently, our proposed solution relies on international cooperation between tax authorities as much as other transfer pricing-based solution including transactional profit split methods do.

Unlike the seemingly uniform argumentation in the policy debate, the empirical evidence is much less clear on the tax challenges of the digital economy. Our literature review provides little support for the claim that firms in the digital economy engage in particularly aggressive profit shifting. Policymakers should be concerned about the collection of consumption taxes and the enforcement of the destination principle against the background of an immense VAT gap in the European Union. What is more, one should expect that companies with digital business models respond to international tax competition by (re-)locating their significant (intangible) assets and functions via real investment. Such behavior would be an ultimate example of economic distortion via taxes. Against this background, the OECD's approach to further analyze digital business models and avoid ring-fencing, short-term measures appear much more sensible than the European Commission's effort to impose additional burdens or even new forms of taxes on businesses engaging in digital transactions. Overall, it is surprising that policymakers are primarily concerned with combatting tax avoidance in the digital economy given that most economists' view on the prospects of digitalization would rather call for designing tax rules that do not distort investment decisions. Along these lines, the European Commission's approach of taxing digital businesses contradicts its general endeavors to establish favorable conditions for a flourishing digital single market in the European Union.

Although the concept of taxing business profits according to value creation is imperfect itself, we use it to propose a conceptual way forward for a consensus-based, timely solution to tax businesses in the digital economy. We argue that the question of a taxable nexus is not a primary issue unless the pure collection of data via the internet is considered a particular value driver. In contrast, many firms with digital business models invest in (digital) assets and employ people in locations where they have a significant market. We analyze data mining as a concept that reflects the value creation process in many digital business models. In particular, we highlight that data mining consists of several processes that altogether make data valuable. Although the tax system is outdated, we provide some thoughts on how existing principles of transfer pricing can be applied to data-driven businesses since third party transactions along the value chain of data mining exist and can be priced.

While arguments exist that the current tax system relies on flawed foundations that lack justification, fundamental reform options that might overcome these weaknesses and have the merit of not taxing mobile assets and activities do not seem feasible in the near future given the often-conflicting national interests. Instead, tax policy itself might leverage the abundant data the digital economy provides for. For example, arm's length prices for data-driven intangibles might be available if several business models of data providers across the value chain of data

mining are used as a benchmark. In sum, we recognize a substantial need for further research in various disciplines on how value is created in digital business models in order to substantiate the debate of how profits generated by digital businesses should be taxed.

## References

- Bartelsman, E. J., & Beetsma, R. (2003). Why pay more? Corporate tax avoidance through transfer pricing in OECD countries. *Journal of Public Economics* 87(9-10), 2225-2252.
- Bauer, M. (2018). Digital Companies and Their Fair Share of Taxes: Myths and Misconceptions. *ECIPE Occasional Paper* 03/2018. <http://ecipe.org/publications/digital-companies-and-their-fair-share-of-taxes/>
- Becker, J., & Englisch, J. (2018). EU Digital Services Tax: A Populist and Flawed Proposal - *Kluwer International Tax Blog*. <http://kluwertaxblog.com/2018/03/16/eu-digital-services-tax-populist-flawed-proposal>.
- Bloomberg (2018). *Europe's Digital Tax is a Bad Idea*.  
<https://www.bloomberg.com/view/articles/2018-04-11/europe-s-digital-tax-is-a-bad-idea>.
- Boire, R. (2014). *Data Mining for Managers: How to Use Data (Big and Small) to Solve Business Challenges*. New York: Plagrave Macmillan.
- Brauner, Y., & Baez, A. (2015). Withholding Taxes in the Service of BEPS Action 1: Address the Tax Challenges of the Digital Economy. *IBFD Whitepaper*.  
<https://www.ibfd.org/sites/ibfd.org/files/content/WithholdingTaxesintheServiceofBEPSAction1-whitepaper.pdf>
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age : Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W.W. Norton & Company.
- Brynjolfsson, E., & McAfee, A. (2017). *Machine, Platform, Crowd : Harnessing Our Digital Future*. New York: W.W. Norton & Company.
- Brynjolfsson, E., & Mitchell, T. (2017). What Can Machine Learning Do? Workforce Implications. *Science* 358 (6370), 1530–34.
- CASE, & HIS. (2017). *Study and Reports on the VAT Gap in the EU-28 Member States: 2017 Final Report*. TAXUD/2015/CC/131. Retrieved from  
[https://ec.europa.eu/taxation\\_customs/sites/taxation/files/study\\_and\\_reports\\_on\\_the\\_vat\\_gap\\_2017.pdf](https://ec.europa.eu/taxation_customs/sites/taxation/files/study_and_reports_on_the_vat_gap_2017.pdf) (August 30, 2018).
- CFE Fiscal Committee. (2018). Opinion Statement FC 1/2018 on the European Commission Proposal of 21 March 2018 for a Council Directive on the Common System of a Digital Services Tax on Revenues Resulting from the Provision of Certain Digital Services. *European Taxation* 58(8); 371–74. Retrieved from  
[https://ec.europa.eu/taxation\\_customs/sites/taxation/files/proposal\\_common\\_system\\_digital\\_services\\_tax\\_21032018\\_en.pdf](https://ec.europa.eu/taxation_customs/sites/taxation/files/proposal_common_system_digital_services_tax_21032018_en.pdf).
- Council of the European Union. (2016). *Council Directive (EU) 2016/1164*. Retrieved from

- <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L1164&from=EN> (August 30, 2018).
- Devereux, M. P., & Griffith, R. (1998). Taxes and the Location of Production: Evidence from a Panel of US Multinationals. *Journal of Public Economics* 68(3), 335–67.
- Devereux, M. P., & Griffith, R. (1999). The Taxation of Discrete Investment Choices. *IFS Working Paper Series, W98/16*.
- Devereux, M. P., & Griffith, R. (2003). Evaluating tax policy for location decisions. *International Tax and Public Finance* 10(2), 107-126.
- Devereux, M. P., & Vella, J. (2017). *Implications of Digitalization for International Corporate Tax Reform*. Retrieved from <http://eureka.sbs.ox.ac.uk/6809/1/WP1707.pdf>.
- Devereux, M. P., Lockwood, B., & Redoano, M. (2008). Do Countries Compete over Corporate Tax Rates?. *Journal of Public Economics* 92, 1210–35. Retrieved from [www.elsevier.com/locate/econbase](http://www.elsevier.com/locate/econbase) (August 29, 2018).
- Devereux, M. P., & Vella, J. (2018). *Response to the EU Commission’s Consultation - Fair Taxation of the Digital Economy*.
- Dharmapala, D. (2014). What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature. *Fiscal Studies* 35(4), 421–48.
- Dischinger, M., & Riedel, N. (2011). Corporate Taxes and the Location of Intangible Assets within Multinational Firms. *Journal of Public Economics* 95(7–8), 691–707.
- Economist. (2016). Corporate Tax. Going After Google. 30 January 2016.
- Endres, D., & Spengel, C. (2015). *International Company Taxation and Tax Planning*. Alphen aan Den Rijn: Kluwer Law International.
- Ernst, C., Richter, K., & Riedel, N. (2014). Corporate taxation and the quality of research and development. *International Tax and Public Finance* 21(4), 694-719.
- European Commission. (2014). *Report of the Commission Expert Group on Taxation of the Digital Economy*. Retrieved from [http://ec.europa.eu/taxation\\_customs/resources/documents/taxation/gen\\_info/good\\_governance\\_matters/digital/report\\_digital\\_economy.pdf](http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/good_governance_matters/digital/report_digital_economy.pdf).
- European Commission. (2016a). *European Commission - Press Release - Commission Proposes New Tax Rules to Support e-Commerce and Online Businesses in the EU*. Retrieved from [http://europa.eu/rapid/press-release\\_IP-16-4010\\_en.htm](http://europa.eu/rapid/press-release_IP-16-4010_en.htm) (August 30, 2018).
- European Commission. (2016b). *European Commission Press Release 7 April 2016 - VAT Action Plan: Commission Presents Measures to Modernise VAT in the EU*. Retrieved

- from [http://europa.eu/rapid/press-release\\_IP-16-1022\\_en.htm](http://europa.eu/rapid/press-release_IP-16-1022_en.htm) (August 30, 2018).
- European Commission. (2018a). *Impact Assessment Proposal for a Council Directive Laying down Rules Relating to the Corporate Taxation of a Significant Digital Presence and Proposal for a Council Directive on the Common System of a Digital Services Tax on Revenues Resulting from the Provision of Certain Digital Services*. Retrieved from [https://ec.europa.eu/taxation\\_customs/sites/taxation/files/fair\\_taxation\\_digital\\_economy\\_ia\\_21032018.pdf](https://ec.europa.eu/taxation_customs/sites/taxation/files/fair_taxation_digital_economy_ia_21032018.pdf) (September 6, 2018).
- European Commission. (2018b). *Proposal for a COUNCIL DIRECTIVE Laying down Rules Relating to the Corporate Taxation of a Significant Digital Presence*. Retrieved from [https://ec.europa.eu/taxation\\_customs/sites/taxation/files/proposal\\_significant\\_digital\\_presence\\_21032018\\_en.pdf](https://ec.europa.eu/taxation_customs/sites/taxation/files/proposal_significant_digital_presence_21032018_en.pdf) (August 29, 2018).
- European Commission. (2018c). *Proposal for a COUNCIL DIRECTIVE on the Common System of a Digital Services Tax on Revenues Resulting from the Provision of Certain Digital Services*. Retrieved from [http://www.mef.gov.it/inevidenza/banner/170907\\_joint\\_initiative\\_digital\\_taxation.pdf](http://www.mef.gov.it/inevidenza/banner/170907_joint_initiative_digital_taxation.pdf) (August 29, 2018).
- EY. (2018). *The OECD's Interim Report on Tax Challenges Arising from Digitalisation: An Overview*. Retrieved from [https://www.ey.com/Publication/vwLUAssets/The\\_OECDs\\_interim\\_report\\_on\\_tax\\_challenges\\_arising\\_from\\_digitalisation\\_-\\_An\\_overview/\\$FILE/2018G\\_01610-181Gbl\\_OECD - An overview on tax challenges arising from digitalisation.pdf](https://www.ey.com/Publication/vwLUAssets/The_OECDs_interim_report_on_tax_challenges_arising_from_digitalisation_-_An_overview/$FILE/2018G_01610-181Gbl_OECD - An overview on tax challenges arising from digitalisation.pdf) (September 6, 2018).
- Griffith, R., Miller, H., & O'Connell, M. (2014). Ownership of Intellectual Property and Corporate Taxation. *Journal of Public Economics* 112, 12–23.
- Goldfein, J., & Nguyen, I. (2018). Data is not the new oil. *Techcrunch*. Retrieved from <https://techcrunch.com/2018/03/27/data-is-not-the-new-oil/>.
- Hanlon, M., and Heitzman, S. (2010). A Review of Tax Research. *Journal of Accounting and Economics* 50(2–3), 127–78.
- Heckemeyer, J. H., Olligs, P., & Overesch, M. (2018). 'Home Sweet Home' versus International Tax Planning: Where Do Multinational Firms Hold Their U.S. Trademarks? *National Tax Journal* 71(3), 485–520.
- HM Treasury. (2018). Corporate tax and the digital economy: position paper update. Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/710320/corporate\\_tax\\_and\\_the\\_digital\\_economy\\_position\\_paper\\_update.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710320/corporate_tax_and_the_digital_economy_position_paper_update.pdf)

[data/file/689240/corporate\\_tax\\_and\\_the\\_digital\\_economy\\_update\\_web.pdf](https://www.ibm.com/data/file/689240/corporate_tax_and_the_digital_economy_update_web.pdf).

- Hongler, P., & Pistone, P. (2015). Blueprints for a New PE Nexus to Tax Business Income in the Era of the Digital Economy. *IBFD White Papers*. Retrieved from [https://www.ibfd.org/sites/ibfd.org/files/content/pdf/Redefining\\_the\\_PE\\_concept-whitepaper.pdf](https://www.ibfd.org/sites/ibfd.org/files/content/pdf/Redefining_the_PE_concept-whitepaper.pdf).
- Hoopes, J. L., Thornock, J. R., & Williams, B. M. (2016). Does Use Tax Evasion Provide a Competitive Advantage to E-Tailers? *National Tax Journal* 9(1), 133–68.
- van Horzen, F., & van Esdonk, A. (2018). Proposed 3 % Digital Services Tax. *International Transfer Pricing Journal* 25(March), 267–72.
- Irish Department of Finance. (2018). *CORPORATION TAX Tax Strategy Group - TSG 18/01*. Retrieved from <https://www.finance.gov.ie/wp-content/uploads/2018/07/TSG-18-01-Corporation-Tax-DD.pdf>.
- Jacob, M., Michaely, R., & Müller, M. A. (2018). Consumption Taxes and Corporate Investment. *Working Paper*.
- Keuschnigg, C., & Devereux, M. P. (2013). The arm's length principle and distortions to multinational firm organization. *Journal of International Economics* 89(2), 432-440.
- Klassen, K. J., Laplante, S. K., & Carnaghan, C. (2014). A Model of Multinational Income Shifting and an Application to Tax Planning with E-Commerce. *The Journal of the American Taxation Association* 36(2), 27-53.
- Larose, D. T., & Larose, C. D. (2014). *Discovering knowledge in data: an introduction to data mining*. Hoboken: John Wiley & Sons.
- Lazaro, S. (2017). *Analysis of National Initiatives for Digitising Industry. Italy : Piano Nazionale “ Industria 4.0”*. Retrieved from [https://ec.europa.eu/futurium/en/system/files/ged/it\\_country\\_analysis.pdf](https://ec.europa.eu/futurium/en/system/files/ged/it_country_analysis.pdf) (August 30, 2018).
- Lev, B., & Gu, F. (2017). *The End of Accounting and the Path Forward for Investors and Managers*. Hoboken: John Wiley & Sons.
- Marr, B. (2018). Here’s Why Data Is Not The New Oil. *Forbes*. Retrieved from <https://www.forbes.com/sites/bernardmarr/2018/03/05/heres-why-data-is-not-the-new-oil/#96cbfe93aa96>
- McKinsey Global Institute. (2016). *The Age of Analytics: Competing in a Data-driven World*. Retrieved from <https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Analytics/Our%20Insights/The%20age%20of%20analytics%20Competing%20in%20a%20>

[Odata%20driven%20world/MGI-The-Age-of-Analytics-Full-report.ashx](#)

- OECD. (2013). *Addressing Base Erosion and Profit Shifting*. Paris: OECD Publishing.
- OECD. (2015a). *Addressing the Tax Challenges of the Digital Economy*. Paris: OECD Publishing. Retrieved from <http://www.oecd-ilibrary.org.ez.urosario.edu.co/docserver/download/2314251e.pdf?expires=1429553838&id=id&accname=guest&checksum=446CDC8269DEAE27FEB0B6D9820B9960>.
- OECD. (2015b). *Measuring and Monitoring BEPS, Action 11 - 2015 Final Report*, OECD/G20 Base Erosion and Profit Shifting Project. Paris: OECD Publishing. <https://doi.org/10.1787/9789264241343-en>.
- OECD. (2016). *The Internet of Things: Seizing the Benefits and Addressing the Challenges. OECD Digital Economy Papers, No. 252*. Retrieved from <https://www.oecd-ilibrary.org/docserver/5jlvwzz8td0n-en.pdf?expires=1535566732&id=id&accname=guest&checksum=42FDA2552FAB0BBAAEA38750854957BD> (August 29, 2018).
- OECD. (2017a). *International VAT/GST Guidelines*. Paris: OECD Publishing. Retrieved from <https://www.oecd-ilibrary.org/docserver/9789264271401-en.pdf?expires=1535609904&id=id&accname=ocid41023547&checksum=94026D85CE5F6473A183D71C33F92F11> (August 30, 2018).
- OECD. (2017b). *OECD Digital Economy Outlook 2017*. Paris: OECD Publishing. Retrieved from <https://www.oecd-ilibrary.org/docserver/9789264276284-en.pdf?expires=1535567296&id=id&accname=ocid41023547&checksum=0ABBFB12940FFBD41044E970A280C72A> (August 29, 2018).
- OECD. (2017c). *70 OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*. Paris: OECD Publishing.
- OECD. (2018a). *Revised Guidance on the Application of the Transactional Profit Split Method*. Paris: OECD Publishing.
- OECD. (2018b). *Tax Challenges Arising from Digitalisation - Interim Report 2018*. Paris: OECD Publishing.
- Olbert, M., & Spengel, C. (2017). International taxation in the digital economy: challenge accepted. *World tax journal* 9(1), 3-46.
- Olbert, M., & Werner, A.-C. (2018). *Corporate Income and Consumption Tax Planning in the Digital Age - Evidence from European Service Firms*. Working Paper.
- Oracle. (2018). *What Is Big Data?*. Retrieved from <https://www.oracle.com/big-data/guide/what-is-big-data.html> (September 6, 2018).

- Petruzzi, R., & Koukouloti, V. (2018). The European Commission's Proposal on Corporate Taxation and Significant Digital Presence : A Preliminary Assessment. *European Taxation* (September): 391–400.
- Porter, M. E. (1985). *The Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.
- El Sawy, O. A., & F. Pereiry. (2013). *Business Modelling Digital Space in the Dynamic An Ecosystem Approach*. Berlin, Heidelberg: Springer.
- Schoen, W. (2018). Ten Questions About Why and How to Tax the Digitalized Economy. *Bulletin for International Taxation* (June), 278–92.
- Scholes, M. S., Wolfson, M. A., Erickson, M. M., Hanlon, M. L., Maydew, E. L., & Shevlin T. J. (2015). *Taxes and Business Strategy : A Planning Approach*. Edinburgh: Pearson.
- Schrage, M. (2016). Rethinking the Value of Customers in a Digital Economy. *MIT Sloan Management Review*. Retrieved from <https://sloanreview.mit.edu/article/rethinking-the-value-of-customers-in-a-digital-economy/>.
- Schreiber, U., & Fell, L. M. (2017). International profit allocation, intangibles and sales-based transactional profit split. *World Tax Journal* 9(1), 1-18.” [https://www.ibfd.org/IBFD-Products/Journal-Articles/World-Tax-Journal/collections/wtj/pdf/wtj\\_2017\\_01\\_int\\_5.pdf](https://www.ibfd.org/IBFD-Products/Journal-Articles/World-Tax-Journal/collections/wtj/pdf/wtj_2017_01_int_5.pdf)
- Sheppard, L. A. (2018). International / OECD / European Union / United States Digital Permanent Establishment and Digital Equalization Taxes. *Bulletin for International Taxation* 72(4), 4–9.
- Spengel, C., Nicolay, K., Werner, A.-C., Olbert, M., Schmidt, F., & Wolf, T. (2017). *Steuerliche Standortattraktivität digitaler Geschäftsmodelle: steuerlicher Digitalisierungsindex 2017*. Retrieved from [ftp://ftp.zew.de/pub/zew-docs/gutachten/Studie\\_Digitale\\_Geschaeftsmodelle\\_2017.pdf](ftp://ftp.zew.de/pub/zew-docs/gutachten/Studie_Digitale_Geschaeftsmodelle_2017.pdf) and [www.pwc.de/digitalisierungsindex2017](http://www.pwc.de/digitalisierungsindex2017).
- Tørsløv, T. R., Wier, L. S. & Zucman, G. (2018). The Missing Profits of Nations. *National Bureau of Economic Research, No. w24701*.
- United Nations. (2017). Practical Manual on Transfer Pricing for Developing Countries. Retrieved from <http://www.un.org/esa/ffd/wp-content/uploads/2017/04/Manual-TP-2017.pdf>.
- Wissenschaftlicher Beirat beim Bundesministerium der Finanzen (The Advisory Board to the Federal Ministry of Finance). (2018). *Stellungnahme zu den EU-Vorschlägen für eine Besteuerung der digitalen Wirtschaft*. Retrieved from <https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Ministerium/Gesc>

[haeftsbereich/Wissenschaftlicher Beirat/Gutachten und Stellungnahmen/Ausgewaehlte Texte/2018-09-27-digitale-Wirtschaft-anl.pdf? blob=publicationFile&v=2.](#)

Witten, I. H., Eibe, F., Hall, M. A., & Pal, C. J. (2017). *Data Mining: Practical Machine Learning Tools and Techniques*. Amsterdam: Morgan Kaufmann.

World Bank Group, Lange, G.-M., Wodon, Q., Carey, K. (2018). *The Changing Wealth of Nations 2018: Building a Sustainable Future*. Washington, DC: World Bank.  
<https://openknowledge.worldbank.org/bitstream/handle/10986/29001/9781464810466.pdf?sequence=4&isAllowed=y>

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research. *Journal of Management* 37(4), 1019-1042. Retrieved from  
<http://www.cse.tkk.fi/fi/opinnot/T-109.4300/2013/luennot-files/Zott%20et%20al.%20-%202011%20-%20The%20Business%20Model%20Recent%20Developments%20and%20Future%20Research.pdf>



Download ZEW Discussion Papers from our ftp server:

<http://ftp.zew.de/pub/zew-docs/dp/>

or see:

<https://www.ssrn.com/link/ZEW-Ctr-Euro-Econ-Research.html>

<https://ideas.repec.org/s/zbw/zewdip.html>



**IMPRINT**

**ZEW – Leibniz-Zentrum für Europäische  
Wirtschaftsforschung GmbH Mannheim**

ZEW – Leibniz Centre for European  
Economic Research

L 7,1 · 68161 Mannheim · Germany

Phone +49 621 1235-01

info@zew.de · zew.de

Discussion Papers are intended to make results of ZEW research promptly available to other economists in order to encourage discussion and suggestions for revisions. The authors are solely responsible for the contents which do not necessarily represent the opinion of the ZEW.