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Cloudy with a Chance of Taxation

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CLOUDY WITH A CHANCE OF TAXATION

by

Rifat Azam and Orly Mazur***

ABSTRACT

The growth of the digital economy, and, in particular, cloud computing, has put a significant strain on sales taxation and other consumption tax systems. The borderless, anonymous, and digital nature of cloud computing raises questions about the paradigm used to determine the character of the transaction and the location where consumption, and therefore, taxation occurs. From a U.S. perspective, the effective resolution of these issues continues to grow in importance in light of the recent Supreme Court decision in South Dakota v. Wayfair and the growing number of U.S. businesses transacting overseas in jurisdictions that impose value-added taxes (VATs).

The cloud magnifies difficulties with VAT compliance and enforcement, as businesses increasingly are subject to VAT laws in multiple jurisdictions. Tax authorities therefore have to collect from remote vendors who have numerous opportunities for VAT avoidance and evasion. The outcome of these challenges is unfair competition, a burden on international trade, and a huge gap in VAT revenues.

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In this important Article, we closely analyze these cutting-edge challenges and contribute to the debate on how to tax the digital economy. We argue that while the approaches taken by both the Organisation for Economic Co-operation and Development, of which the United States is a member, and the European Union introduce some noteworthy improvements to the current system, more substantial measures are necessary. Thus, we propose a range of fundamental changes that include improving the existing registration-based VAT system through the enhanced use of new technologies, replacing the current system with a blockchain real-time basis VAT system, and shifting the VAT collection burden from suppliers to payment intermediaries. As the digital transformation of the economy accelerates, each of these changes will help adapt consumption taxation to the modern realities of our digital era.

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INTRODUCTION

The digital economy is changing the world.¹ It has digitalized our economy, society, and lives, which, in turn, has revolutionized everything from the way we consume and interact to the way we do business.² Given this new environment, almost every sector of the economy has had to evolve to take into account these changes.³ The tax system is no exception.

1. See IMF, *Measuring the Digital Economy* 7 (Apr. 5, 2018), <https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/04/03/022818-measuring-the-digital-economy>; OECD, *Addressing the Tax Challenges of the Digital Economy: Action 1: 2015 Final Report* (Oct. 5, 2015), https://read.oecd-ilibrary.org/taxation/addressing-the-tax-challenges-of-the-digital-economy-action-1-2015-final-report_9789264241046-en#page1 [hereinafter *Action 1 Final Report*]; Philippe Stephanny & Juan Vazquez, *VAT and the Digital Economy: The Untold Story of Global Challenges*, 87 TAX NOTES INT'L 337, 339 (July 24, 2017); *What Is Digital Economy?: Unicorns, Transformation and the Internet of Things*, DELOITTE, <https://www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digital-economy.html#> (last visited May 27, 2019).

2. See CHRIS SKINNER, *DIGITAL HUMAN: THE FOURTH REVOLUTION OF HUMANITY INCLUDES EVERYONE* (2018); *Five Trends Reshape Indirect Tax Landscape*, EY TAX INSIGHTS, <http://taxinsights.ey.com/archive/archive-articles/five-trends-reshape-indirect-tax-landscape.aspx> (last visited May 27, 2019); *What Is Digital Economy?*, *supra* note 1.

3. See *Digital Transformation Is Racing Ahead and No Industry Is Immune*, HARV. BUS. REV. (July 19, 2017), <https://hbr.org/sponsored/2017/07/digital-transformation-is-racing-ahead-and-no-industry-is-immune-2>; Florian Leibert, *3 Things Every Company Can Do to Benefit from Digital Disruption*,

This new global digital era has significant implications for our current tax systems. These systems are unable to adequately tax digital transactions, giving rise to uncertainty for taxpayers and concern for tax administrations. Given the rapid and widespread shift in consumption from the physical world to the digital world, one particular area of concern is the continued viability of consumption tax systems, such as the value added tax (VAT).

Several methods can be used to tax the value of goods and services consumed by taxpayers, the most popular of which is the VAT. Coinciding with this digital revolution, the VAT has become the “go to” tax for many countries across the world.⁴ Limited to use in less than 10 countries in the late 1960s, today the VAT system (including the Goods and Services Tax (GST))⁵ is an important source of revenue in more than 166 countries worldwide.⁶ This number is expected to grow through the 21st century as the digital economy continues to pose threats to the viability of current tax systems and introduces new ways to capture additional tax revenue.⁷

Although the United States is one of the few modern economies without a VAT system, the VAT can have a significant impact on any business engaged in international trade, including many U.S. businesses.⁸ As the world becomes more digital, the number of businesses

WORLD ECON. F. (Dec. 14, 2017), <https://www.weforum.org/agenda/2017/12/3-things-every-company-can-do-to-avoid-digital-disruption/>.

4. See Jay Nibbe, *Indirect Taxes Are ‘Tax of the Moment,’* EY TAX INSIGHTS, <https://taxinsights.ey.com/archive/archive-articles/indirect-taxes-are-tax-of-the-moment.aspx> (last visited May 27, 2019).

5. References in this paper to “VAT” generally refer to both VAT and GST systems.

6. OECD, *Consumption Tax Trends 2016: VAT/GST and Excise Rates, Trends and Policy Issues* 21 (2016), https://www.oecd-ilibrary.org/taxation/consumption-tax-trends-2016_ctt-2016-en; *VAT Compliance: The Impact on Business and How Technology Can Help*, PWC (2017), https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/pwc_vat_compliance_paying_taxes_2017.pdf [hereinafter *VAT Compliance*]. According to the OECD, VAT revenues are at an all-time high in OECD countries at 6.8% of GDP and at 20.1% of total tax revenue on average, up from respectively 6.6% of GDP and 19.8% of total tax revenue in 2012. OECD, *Consumption Tax Trends*, *supra*, at 11.

7. See *VAT Compliance*, *supra* note 6.

8. See *EY Roundtable—Taxing the Cloud*, J. INT’L TAX’N, Apr. 2014, at 38, 43–44; Nibbe, *supra* note 4.

engaged in cross-border economic activities continues to increase exponentially, thereby exposing more companies to VAT liability in numerous jurisdictions. Moreover, because the VAT system is not equipped to tax this new world, businesses confront uncertainty, heavy compliance burdens, and potential double taxation when trying to comply with their VAT obligations. At the same time, applying current VAT principles to the digital world gives rise to VAT collection and enforcement challenges, which threaten government tax revenues, distort competition, and burden international trade.⁹ Given the Supreme Court's recent holding in *South Dakota v. Wayfair*, enabling states to impose retail sales tax collection duties on out-of-state retailers, the implications of the VAT debate have become even more significant for the U.S. sales tax system.¹⁰ Thus, even from a U.S. perspective, the ability of current VAT systems to effectively tax digital transactions has considerable implications that should be taken seriously.

With the digital economy continuing to rapidly grow and transform, addressing these challenges has increasingly been the subject of ongoing discussions.¹¹ Although countries are beginning to adapt their

9. See *Action 1 Final Report*, *supra* note 1, at 119; OECD, *International VAT/GST Guidelines* 10 (2017), https://read.oecd-ilibrary.org/taxation/international-vat-gst-guidelines_9789264271401-en#page1 [hereinafter *OECD Guidelines*]; THOMAS ECKER, A VAT/GST MODEL CONVENTION 31 (2013).

10. See *South Dakota v. Wayfair, Inc.*, 138 S. Ct. 2080 (2018). Some important implications are discussed in Walter Hellerstein, *Taxing Remote Sales in the Digital Age: A Global Perspective*, 65 AM. U. L. REV. 1195, 1224 (2016) (noting that “the broad lessons that emerge from the global perspective on taxing remote sales provide meaningful guidance for, and are generally reflected in, the U.S. RST”).

11. Significantly, the Organisation for Economic Co-operation and Development (OECD) issued a report identifying the tax challenges of the digital economy as its number one action item to address base erosion and profit shifting and, more recently, issued an interim report further considering the tax challenges of the digital economy. See *Action 1 Final Report*, *supra* note 1; OECD, *Tax Challenges Arising from Digitalisation—Interim Report 2018: Inclusive Framework on BEPS* (2018), <https://www.oecd-ilibrary.org/docserver/9789264293083-en.pdf?expires=1552576373&id=id&acname=guest&checksum=8F634139ED017A7F30C8AA9D41125B84> [hereinafter *OECD Interim Report*]. In light of the OECD's work, numerous governments have begun taking unilateral actions to tax digital activities. See, e.g., HM TREASURY, CORPORATE TAX AND THE DIGITAL ECONOMY: POSITION PAPER UPDATE

VAT systems, more significant reforms are needed. Now is the time to seriously consider how to adapt our VAT rules to the 21st century, and we seek to further these efforts. Specifically, this Article makes three key contributions to the evolving debate over taxing the digital economy.

First, this Article provides a detailed examination of the main difficulties that the digital economy poses for the application of existing VAT rules. Cloud computing, a significant component of the digital economy, magnifies many of the challenges that the digital economy creates for our current VAT system.¹² In particular, the cloud environment involves the use of borderless, anonymous, instantaneous transactions and has facilitated the electronic delivery of services on a much larger scale than previously experienced. Consequently, there has been a significant increase in both the number of transactions subject to VAT and the number of suppliers who must comply with VAT requirements. These features of the cloud environment contradict fundamental

(Mar. 2018) (UK); *Proposal for a Council Directive on the Common System of a Digital Services Tax on Revenues Resulting from the Provision of Certain Digital Services*, COM (2018) 148 final (Mar. 21, 2018); *Proposal for a Council Directive Laying Down Rules Relating to the Corporate Taxation of a Significant Digital Presence*, COM (2018) 147 final (Mar. 21, 2018).

In addition, an increasing amount of academic scholarship has focused on the taxation of the digital economy. *See, e.g.*, Rifat Azam, *Global Taxation of Cross-Border E-Commerce Income*, 31 VA. TAX REV. 639 (2012); Jinyan Li, *Protecting the Tax Base in the Digital Economy*, in UNITED NATIONS HANDBOOK ON SELECTED ISSUES IN PROTECTING THE TAX BASE OF DEVELOPING COUNTRIES 407 (Alexander Trepelkov et al. eds., 2015); Orly Mazur, *Taxing the Cloud*, 103 CALIF. L. REV. 1 (2015); Orly Mazur, *Transfer Pricing Challenges in the Cloud*, 57 B.C. L. REV. 643 (2016); Arthur Cockfield, *BEPS and Global Digital Taxation*, 75 TAX NOTES INT'L 933 (Sept. 15, 2014); Andrés Báez Moreno & Yariv Brauner, *Policy Options Regarding Tax Challenges of the Digitalized Economy: Making a Case for Withholding Taxes* (Apr. 23, 2018), <https://ssrn.com/abstract=3167124>; Wolfgang Schön, *Ten Questions About Why and How to Tax the Digitalized Economy*, (Max Planck Inst. for Tax Law and Pub. Fin., Working Paper No. 2017-11, 2017), <https://ssrn.com/abstract=3091496>.

12. *See* Walter Hellerstein, *Consumption Taxation of Cloud Computing: Lessons from the US Subnational Retail Sales Tax Experience*, in VALUE ADDED TAX AND THE DIGITAL ECONOMY: THE 2015 EU RULES AND BROADER ISSUES 149, 149 (Marie Lamensch et al. eds., 2016) (“If one is looking for an appropriate focus for examining the challenges that the digital economy poses for VATs, it would be hard to find a better candidate than cloud computing.”); *see also Action 1 Final Report*, *supra* note 1, at 54.

premises of the VAT system, giving rise to substantial challenges when attempting to capture the appropriate amount of VAT on cloud computing transactions.

For instance, the use of the cloud generally eliminates the transfer of any physical components.¹³ Therefore, border controls cannot apply to virtual transactions as they do to physical goods, contributing to VAT compliance and enforcement complexities. Because many cloud transactions are relatively small and are often consummated between parties in different places that do not necessarily know each other's location, it is often difficult for both suppliers and tax authorities to acquire and verify the customer information. This difficulty is compounded by the fact that cloud transactions are unrestrained by time and place, which means that cloud services are often provided from remote locations that may vary throughout the term of the cloud service agreement and may not necessarily correspond to, or may even obscure, the place of consumption.¹⁴ Thus, the place of consumption and the jurisdiction with taxing authority can be difficult for a service provider and tax authorities to identify. This determination also depends on correctly characterizing the transaction. However, the virtual nature of cloud computing transactions blurs the distinction between goods and services and gives rise to other characterization issues.¹⁵ Given these features, cloud computing has proven to be a disruptive technology, not only in the business world, but also in the tax world.

Second, building on this background, this Article contributes to the existing literature by critically evaluating the progress made at the international level (by reviewing the work of the OECD) and the progress made at the national level (by considering the approaches taken by the European Union (EU)) in addressing these challenges. Despite important progress made by both the OECD and EU, we argue that the current approaches are not enough and more substantial reform is needed.

Third, we build upon and address the shortcomings of these current approaches to develop a range of policy options. Recognizing that

13. See Mazur, *Taxing the Cloud*, *supra* note 11, at 9–10.

14. See *Action 1 Final Report*, *supra* note 1, at 59; *EY Roundtable*, *supra* note 8, at 39; Mazur, *Taxing the Cloud*, *supra* note 11, at 11; Mark Brinda & Michael Heric, *The Changing Faces of the Cloud*, BAIN & CO. (Jan. 25, 2017), <https://www.bain.com/insights/the-changing-faces-of-the-cloud/>.

15. See Hellerstein, *supra* note 12, at 162.

there is no easy solution to the challenges that the digital revolution has created for VAT systems, this Article provides an arsenal of tools that VAT jurisdictions and international institutions can consider in their attempts to better cope with the challenges of VAT and cloud computing and to protect their tax bases.

The remainder of this Article proceeds as follows: Part I provides a brief overview of the key principles that underlie most VAT systems and identifies the key features of cloud computing transactions that present the main challenges to current VAT systems. Part II explores the numerous challenges that cloud computing transactions pose for VAT systems and how these challenges, collectively, threaten to undermine the VAT tax base. Part III discusses the initiatives taken by the OECD and EU to address these challenges and analyzes their progress in this regard. Part IV argues that additional and more substantial VAT reform is essential and sets forth several recommendations for VAT reform. In making these recommendations, we seek to ensure that our consumption tax systems evolve to reflect the economic realities of this global, digital era.

I. TAXING CLOUD COMPUTING

The rise of the VAT is one of the most interesting stories and significant trends in the evolution of global tax systems in recent times and has become one of the world's most dominant revenue instruments.¹⁶ With the exception of the United States,¹⁷ the VAT system now applies in most major economies throughout the world, and its use continues to

16. See KATHRYN JAMES, *THE RISE OF THE VALUE-ADDED TAX* (2015).

17. The VAT has been proposed and discussed numerous times in the United States, but it has never yet been accepted. See *A Value Added Tax for the United States?*, TAX FOUND. (June 1, 1979), <https://files.taxfoundation.org/legacy/docs/sr-vat-19790601.pdf>; Daniel J. Mitchell, *The Case Against the Value-Added Tax*, CATO INST. (July 26, 2011), <https://www.cato.org/publications/congressional-testimony/case-against-valueadded-tax>. Instead of a national VAT, in the United States, most states impose a retail sales tax, which is a single stage consumption tax imposed on the sale or lease of most goods and some services to the final consumer. Despite structural and other differences between the VAT system and the U.S. retail sales tax, cloud computing raises some similar issues for both tax systems, and both systems have significant implications for multinational businesses. See ALAN SCHENK ET AL., *VALUE ADDED TAX: A COMPARATIVE APPROACH* 20 (2d ed. 2015).

grow as more countries adopt VAT systems and revise their current ones.¹⁸

The increasing popularity of the VAT interacts with another fascinating trend: the growing and prevalent use of cloud computing. Given the scalable, relatively inexpensive, on-demand access to information technology (IT) capabilities that the cloud provides, more and more companies have moved their business to the cloud. As a result, cloud computing has contributed to the rapid and widespread shift in consumption from the physical world to the virtual world in a manner that has created significant challenges for VAT systems worldwide. This trend is only expected to continue to increase as experts predict the public cloud market will grow to \$236 billion in 2020.¹⁹

A. Cloud Computing: A New IT Paradigm

Broadly speaking, cloud computing refers to the on-demand delivery of computing resources remotely through the internet (the “cloud”).²⁰ These transactions differ from the traditional provision of goods and services in several respects that undermine the fundamental features of current VAT systems. First, cloud computing transactions occur almost entirely in the virtual world. In a typical cloud computing transaction, the cloud vendor provides the user with online access to software, applications, computing power, and other information technology (IT) resources,

18. OECD, *Consumption Tax Trends*, *supra* note 6; Emily Ann Satterthwaite, *On the Threshold: Smallness and the Value-Added Tax*, 9 COLUM. J. TAX L. 177 (2018).

19. See *Public Cloud Market Will Grow to \$236 Billion in 2020*, FORRESTER (Sept. 1, 2016), <http://blogs.forrester.com/press-newsroom/public-cloud-market-will-grow-to-236-billion-in-2020/> (noting that this forecast is much higher than what Forrester projected several years ago).

20. See PETER MELL & TIMOTHY GRANCE, NAT’L INST. OF STANDARDS & TECH., U.S. DEP’T. OF COMMERCE, SPECIAL PUB. NO. 800-145, *THE NIST DEFINITION OF CLOUD COMPUTING 2* (2011) (defining cloud computing as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models”).

whereas previously the vendor would have provided the user with physical or electronic possession of those same resources.²¹

Second, the cloud model provides for broad network access.²² This means that customers can access IT resources through the internet from any location, at any time, and from various devices, such as mobile phones, tablets, and laptops.²³ This feature has eliminated the need for the supplier of IT resources to be physically present in the same jurisdiction as the consumer.

Third, the cloud model provides for on-demand service, which enables customers to unilaterally acquire configurable computing capabilities on an as-needed basis automatically.²⁴ By automating many processes, cloud computing transactions often minimize the interactions between the consumer and the service provider, as well as eliminate the need for the cloud service provider to know where the consumer is located and where it is using the cloud services.²⁵

Fourth, the cloud model uses resource pooling, which refers to a cloud vendor combining its computing resources “to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.”²⁶ Through the use of resource pooling, the performance and consumption of cloud services is likely to involve multiple,

21. See Mazur, *Taxing the Cloud*, *supra* note 11, at 9–13. The three most common cloud computing models are “software as a service” (SaaS), “infrastructure as a service” (IaaS), and “platform as a service” (PaaS). SaaS generally refers to the online provision of software and applications and has quickly transformed the manner in which software is delivered and consumed. See *Action 1 Final Report*, *supra* note 1, at 41. IaaS provides users with virtual access to offsite servers, network equipment, storage, and other computing hardware that users often use to build their own IT platform. PaaS is a means of providing customers with the underlying computing infrastructure, such as the computing hardware components and the operating system, on which to develop and host their own software and applications. See MELL & GRANCE, *supra* note 20, at 2–3.

22. MELL & GRANCE, *supra* note 20, at 2–3.

23. See *id.*

24. *Id.*

25. See Michael A. Jacobs & Kelly C. Miller, *The State Tax Implications of Cloud Computing*, 57 ST. TAX NOTES 709, 713–14 (Sept. 13, 2010).

26. See MELL & GRANCE, *supra* note 20, at 2.

instantaneous exchanges that are ongoing and occur in multiple jurisdictions.²⁷

Finally, by lowering the barriers to entry, the cloud environment has enabled more businesses to engage in cross-border trade and has dramatically multiplied in recent years the global reach of international cloud computing services. This often exposes suppliers to additional VAT compliance challenges as they have to comply with the VAT requirements of many different jurisdictions.²⁸

B. The Broad-Based Multistage Taxation of the VAT

VAT systems vary across jurisdictions. The leading and most influential form of VAT, and the focus of this Article,²⁹ is the European VAT model.³⁰ The second main VAT model, adopted by a smaller group of countries, is the New Zealand GST Model.³¹ These VAT models differ in several significant respects and may encounter distinct challenges as

27. See Matthew Adam Susson, *Thinking Out Cloud: California State Sales and Use Taxability of Cloud Computing Transactions*, 17 *CHAP. L. REV.* 295, 315 (2013).

28. See Charlene Adline Herbain & Marie Lamensch, *Reforming the VAT System for the 21st Century*, *TAX PLAN. INT'L INDIRECT TAXES* (BNA), Aug. 31, 2015.

29. Due to space and time considerations, an examination of the challenges of the digital economy on the New Zealand GST Model and on VAT systems that vary from these two models is outside the scope of this Article.

30. See SCHENK ET AL., *supra* note 17, at 47–48. “The EU’s credit-invoice VAT is the most prevalent form of VAT in use today.” *Id.* at 48. The European VAT Model is based on the European VAT Directive. See Council Directive 2006/112 of 28 November 2006 on the Common System of Value Added Tax, 2006 O.J. (L 347) 1 (EU); Rebecca Miller, *Sources of Conflict in Cross-Border Services Rules for VAT* (Sydney Law Sch. Research Paper 08/14, 2008), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1068542.

31. The New Zealand GST Model has been adopted by New Zealand, Australia, Canada, South Korea, Singapore, South Africa, and a few other countries. See Goods and Services Tax Act 1985 (N.Z.); Miller, *supra* note 30; Alain Charlet & Jeffrey Owens, *An International Perspective on VAT*, 59 *TAX NOTES INT'L* 943, 945 (Sept. 20, 2010); see also Richard Ainsworth, *VAT Fraud: MTIC & MTEC—The Tradable Services Problem*, *TAX.NETWORK* 1 & n.2 (Mar. 2, 2012), <https://tax.network/rainsworth/vat-fraud-mtic-mtec-the-tradable-services-problem/#>.

a result of the digital economy.³² Nevertheless, most VAT systems also share several features in common.

First, VAT systems share a similar objective. A VAT, like the U.S. retail sales tax, is an indirect tax that aims to tax personal consumption comprehensively, neutrally, and efficiently.³³ As the name implies, the VAT functions by imposing and charging tax on the value added at each stage of the production and distribution of goods and services, whereas a retail sales tax is only imposed upon final sale to the consumer.³⁴ The amount of tax is calculated as a percentage of the sales price, which is collected and remitted by each business supplier in the supply chain to the appropriate tax authorities on a periodic basis.³⁵

Second, because the VAT is a tax on final consumption, VAT systems have in place a mechanism to ensure that the tax is borne by the final consumer, rather than by the businesses involved in the supply chain.³⁶ Different methods exist, but under the most common method, the credit invoice method, a business may deduct the tax it incurs on its purchases (input tax credits) from the tax it collects on its taxable sales (output tax).³⁷ By only remitting this net tax liability to

32. One of the main differences between the European VAT Model and the New Zealand GST Model is the manner in which the jurisdiction to tax is determined. The European VAT Model is source-based, which means that the jurisdiction to tax is based on the location of the supply. On the contrary, the New Zealand GST Model is residence-based, which means the jurisdiction to tax is generally based on the residence of the supplier. *See* SCHENK ET AL., *supra* note 17, at 57–58; *see also* Miller, *supra* note 30 (discussing and comparing the key features of the cross-border service rules in the European VAT Model and the New Zealand GST Model). Not only do these two VAT models differ in certain respects, but many variants to these main VAT models also exist across jurisdictions. *See* SCHENK ET AL., *supra* note 17, at 47–58.

33. SCHENK ET AL., *supra* note 17, at 23.

34. *See id.* at 11–12; Leandra Lederman & Joseph C. Dugan, *Information Matters in Tax Enforcement* 19 (Jan. 30, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3325598.

35. *See* SCHENK ET AL., *supra* note 17, at 47; Walter Hellerstein, *A Hitchhiker's Guide to the OECD's International VAT/GST Guidelines*, 18 FLA. TAX REV. 589, 594 (2016).

36. *See* Hellerstein, *supra* note 35, at 594.

37. *Id.*; *see* SCHENK ET AL., *supra* note 17, at 47. For other methods and varieties of VAT in use, *see id.* For an illustration of the mechanics of the

the tax authorities and receiving a refund for any excess input tax paid, the VAT system relieves businesses of the burden of the VAT.³⁸ Nevertheless, businesses remain involved in the VAT collection process and continue to experience many compliance burdens associated with the VAT system.³⁹

The following example illustrates the basic principles of a VAT and how it collects the same amount of tax as an ideal retail sales tax (RST).

A winemaker buys grapes from a grape grower and uses them to produce a case of wine for sale to retailers. . . . The winemaker sells each case of wine for \$70 before tax. The retailer sells a case of wine for \$100 before tax. In an ideal RST, only the sale by the retailer to consumers would be taxed. If the RST rate were 20%, \$20 of tax would be collected by the retailer on the sale of a \$100 case of wine to a final consumer and remitted to the government.

. . . . Because the VAT is charged on all sales of taxable goods and services (“taxable supplies”), the grape grower collects 20% VAT on her sales of grapes, charging the winemaker \$6 of tax on each \$30 of sales. The grape grower remits the \$6 of VAT to the government. The winemaker charges the retailer \$84 (\$70 + \$14 of VAT) per case of wine. Instead of sending all \$14 of VAT to the government, however, the winemaker subtracts the \$6 of VAT paid by the winemaker to the grape grower from the \$14 collected in VAT, and remits \$8 to the government per case of wine sold. Similarly, instead of remitting \$20 per case of wine sold to the government, the retailer subtracts the \$14 of VAT paid by the retailer to the winemaker from the \$20 collected in VAT from the consumer, and remits \$6 to the government per case of wine sold. The tax authority

credit-invoice method, see Walter Hellerstein & Harley Duncan, *VAT Exemptions: Principles and Practice*, 128 TAX NOTES 989, 989–90 (Aug. 30, 2010).

38. See Hellerstein, *supra* note 35, at 594.

39. See *infra* Part II.

receives \$20 in total—\$6 from the grape grower, \$8 from the winemaker, and \$6 from the retailer.⁴⁰

Finally, the jurisdictional reach of the VAT is another important feature of a VAT system. The basic question is whether to apply the destination principle or the origin principle to international transactions. Under the destination principle, personal consumption is assumed to occur in the country of destination and is taxed in that jurisdiction.⁴¹ In this jurisdictional setting, a country may impose VAT on its imports since the importing country is presumed to be the country of consumption. Under similar reasoning, the sale for export is not subject to VAT by the exporting country.⁴² On the contrary, under the origin principle, VAT applies in the country of production, regardless of where the goods or services are consumed.⁴³ Hence, exports are taxed but imports are exempted.

Recently, there has been an increasing agreement worldwide that, with respect to digital supplies, the destination principle should govern international VAT transactions.⁴⁴ To implement this principle, VAT systems generally include place-of-supply rules that set forth where consumption occurs and therefore which jurisdiction can impose its VAT. Because final consumption is often not apparent or easy to ascertain at the time of the transaction, these place-of-supply rules frequently rely on proxies for determining where consumption is most likely to occur and may differ across jurisdictions.⁴⁵ Thus, despite the consensus to apply the destination principle to digital transactions, countries

40. Itai Grinberg, *Where Credit Is Due: Advantages of the Credit-Invoice Method for a Partial Replacement VAT*, 63 TAX L. REV. 309, 314–15 (2010).

41. See SCHENK ET AL., *supra* note 17, at 196.

42. Instead, exports are zero-rated. This means that “not only is the sale for export not taxed, but also a refund is given of VAT paid on inputs included in the exports.” *Id.* at 25.

43. See *id.* at 196.

44. See *id.* at 196; Edoardo Traversa & Emanuele Ceci, *VAT Fraud and the Digital Economy Within the European Union: Risks and Opportunities*, in VALUE ADDED TAX AND THE DIGITAL ECONOMY, *supra* note 12, at 67, 73. But the origin principle continues to play an important role in consumption taxation. The origin principle is implemented in many VAT systems and in the majority of the U.S. retail sales tax systems. See Miller, *supra* note 30.

45. OECD Guidelines, *supra* note 9, at 40–41.

diverge in how they implement the principle in practice, particularly with respect to cross-border cloud transactions.

C. The Challenges of Applying the VAT to Cloud Computing

Cloud computing magnifies the significant challenges that the digital economy has created for VAT systems worldwide. Because “almost any service bought or sold in the ‘cloud’—[is] a distinct class of taxable supplies” for VAT purposes, taxing cross-border digital supplies from the cloud creates difficulties for existing VAT systems that were designed to tax traditional goods and services.⁴⁶ As a result, “many businesses are struggling with the VAT ramifications of the cloud services that they are purchasing, providing or both,”⁴⁷ and governments are having to confront laws that often result in cloud computing transactions being subject to no or an inappropriately low amount of VAT.⁴⁸ In this section, we further explore these challenges.

1. Characterizing the Transactions

Most VAT systems around the world make several distinctions that affect the details of the VAT liability. One common distinction with significant VAT implications is the one made between goods and services.⁴⁹ However, many cloud transactions contain components of both the sale of goods and the provision of services, which further blurs the distinction between a good and a service. In addition, by digitalizing the provision of IT resources and eliminating the transfer of any physical components, cloud computing has transformed many goods into services that are generally intangible in nature. As a result, distinguishing goods from services in the context of cloud computing transactions is problematic and raises the challenging question: Should we classify these

46. Ainsworth, *supra* note 31, at 1 (footnote omitted). This Article focuses on the challenges raised by cross-border digital supplies from the cloud, which is one type of service.

47. Richard T. Ainsworth & Robert Chicoine, *Fighting Technology with Technology: Taking Aim at Electronic Sales Suppression*, 89 TAX NOTES INT’L 1037, 1066 (Mar. 12, 2018).

48. *Action 1 Final Report*, *supra* note 1, at 120.

49. *See, e.g.*, Council Directive 2006/112, *supra* note 30, arts. 14, 24.

digital transactions like their equivalent physical transactions, or should we classify these transactions in a different and unique manner?⁵⁰

To illustrate this challenge, consider the following example. Microsoft Inc., a U.S. corporation, develops office-related software and owns all the intellectual property rights to the software. Subscribers purchase an office account, which enables them to access the most recent version of the software online and to store their files and data on the “Microsoft cloud” or servers and hardware located remotely and owned by Microsoft. Subscriber A is a law student from Germany who pays \$10 a month for the subscription. Subscriber B is a lawyer from France who pays \$10 a month for the subscription.

In this example, the question is whether the Microsoft subscription transaction should be classified as the sale of goods or the provision of services for VAT purposes. On the one hand, selling access to the Microsoft software is similar to the sale of software on a physical disk. Accordingly, the transaction could be characterized as the sale of goods. On the other hand, this transaction is comparable to the provision of services, because no physical goods are transferred in the transaction. Moreover, the transaction includes not only the supply of software but also several components of services, such as software updates, technical support, storage, and global access services. These features would suggest a services characterization.

Even if the character of the digital product is clear, most VAT systems also require a supplier to distinguish between a business to business (B2B) transaction and a business to consumer (B2C) transaction to appropriately assess VAT. As discussed above, VAT is imposed on final consumption by consumers but not on businesses, which can deduct their input tax under the credit invoice method or follow the reverse charge method.⁵¹ Thus, the determination of whether the other side of the transaction is a consumer or a business has important tax implications.⁵² But, suppliers often face significant challenges in determining

50. See Cecília Hargitai, *Value Added Taxation of Electronic Supply of Services Within the European Community* 28 (Jean Monnet Program, Working Paper No. 13/01), <https://jeanmonnetprogram.org/archive/papers/01/013301.html>.

51. See *supra* text accompanying notes 36–37.

52. Different place-of-supply rules often also apply depending on whether the transaction is a B2B transaction or B2C transaction. Accordingly, to properly apply the VAT rules of most jurisdictions, cloud service providers

whether the cloud services recipient is a business or a consumer. It is difficult for e-suppliers to obtain reliable information on their distance e-customers in the very short time frame required to process the transaction and account for the VAT liabilities.⁵³

In our Microsoft example above, to calculate the appropriate VAT liability of the subscriber, Microsoft, as the supplier of the software and related services, would have to first characterize the recipients *A* and *B* as consumers or businesses. Given the current digital environment, Microsoft is likely to communicate with *A* and *B* solely through electronic means and on an automated basis. Often, these communications do not contain sufficient data to clarify the appropriate characterization of the subscriber as a business or consumer according to the applicable laws.⁵⁴ Microsoft also has to bear the costs and burdens of understanding the definitions and characteristics of consumer and business in the country of supply, and of applying these definitions on the facts as collected by Microsoft. Furthermore, changes frequently occur during the term of the transaction. For example, Subscriber *A*, a law student, is expected to become a lawyer and would probably

must first ascertain the VAT status of their customers. See Aleksandra Bal, *The Myth of Taxing Cloud Computing Under EU VAT*, 25 INT'L VAT MONITOR 343, 345 (2014).

53. See Marie Lamensch, *The Treatment of "Digital Products" and Other "E-Services" Under VAT, VAT/GST*, in VAT/GST IN A GLOBAL DIGITAL ECONOMY 15, 19 (Michael Lang & Ine Lejeune eds., 2015).

54. For instance, in the EU, a supplier may treat a customer as a business or "taxable person" if (i) the customer has provided its VAT identification number and the supplier confirms its validity; (ii) the customer provides proof that it is in the process of applying for it; or (iii) the customer is a non-EU person that provides a certificate or other appropriate documentation that demonstrates the customer is a taxable person, and the supplier carries out a reasonable level of verification of the accuracy of the information. Council Implementing Regulation 282/2011 of 15 March 2011, Laying Down Implementing Measures for Directive 2006/112/EC on the Common System of Value Added Tax, art. 18, 2011 O.J. (L 77) 1, 7. However, "in practice, it will be difficult or impossible for recipients of cloud computing services to attach to an online order form documentary evidence that they are in the process of registering for VAT or a copy of their registration certificate for refunding VAT. Just like the services they provide, the ordering procedure of CSPs is likewise essentially automated and involves minimum human intervention." Bal, *supra* note 52, at 345.

continue the subscription and the use of Microsoft's software in his business capacity as lawyer. But Microsoft, as the supplier of the software, may not know of this change, and it is often costly for a supplier to put in procedures to track these changes. In addition, Subscriber *A* and Subscriber *B* might provide false data, and Microsoft's ability to verify the data may be limited.⁵⁵

2. Locating the Place of Supply

The cloud environment also creates challenges in determining which country is entitled to collect VAT on cross-border "services" delivered via the cloud according to the destination principle. In this digital, mobile age, identifying the place of consumption of certain cross-border transactions, especially services and intangibles, can be quite difficult, because these types of transactions do not physically enter a particular jurisdiction.⁵⁶ Without a physical entry point, these transactions are not subject to border controls, which previously served as an effective way to accurately identify the place of consumption.⁵⁷ The cloud environment, by significantly contributing to this recent growth in services and intangibles, exacerbates the already existing difficulties in identifying the appropriate place of taxation of cross-border trade.⁵⁸

The cloud environment also facilitates the ability of a supplier to provide services from a remote location via the use of the internet. This disconnect between the place of performance and place of consumption further magnifies the difficulties in identifying the place of consumption and, therefore, the place of taxation.⁵⁹ For instance, the physical location of the supplier is no longer indicative of the location of the consumer and cannot serve as a reliable proxy for the expected place of consumption. Given these challenges and the trend towards the

55. These issues are exacerbated when the supplier is a small business or one that offers low-value, high-volume services, which is often the case in the cloud context.

56. See *Action 1 Final Report*, *supra* note 1, at 120.

57. See *OECD Guidelines*, *supra* note 9, at 16; Walter Hellerstein, *Consumption Taxation of Cross-Border Trade in Services in an Age of Globalization*, in *GLOBALIZATION AND ITS TAX DISCONTENTS: TAX POLICY AND INTERNATIONAL INVESTMENTS* 305, 308–09 (Arthur J. Cockfield ed., 2010).

58. See *Action 1 Final Report*, *supra* note 1, at 121–22.

59. See *id.* at 133.

destination principle, the place-of-supply rules of many jurisdictions have begun to evolve to focus on the location of the consumer.

This shift creates new issues. For instance, where is the location of the consumer and what is the appropriate proxy for a transaction that occurs entirely online and on an as-needed basis? Because cloud computing transactions, by their nature, enable customers to access the online service from anywhere in the world whenever they want, there are practical difficulties to determining where the customer is located at the time that the service is consumed.

Consider the following situation: a U.S.-based vendor provides online access to its video streaming software to a consumer who lives in Spain, has a German bank account, and accesses software online in the United Kingdom.⁶⁰ Is the customer's billing address, IP address, or some other location the best proxy for the place of final consumption of the software usage? This challenge escalates when the customer accesses the services from multiple jurisdictions and the contract often spans several years. Given the ongoing nature of many cloud offerings, multiple and varying points of use are a common occurrence.

Similar issues arise in a B2B transaction where the customer is a business. Consider for example a U.S.-based vendor that provides online access to its proprietary software to a business customer headquartered in Luxembourg with employees worldwide. The cloud computing customer contract sets forth the cloud services provided, the costs and payment terms, the duration of the contract, and generally includes the business customer's headquarters as the mailing and billing address.⁶¹ However, the contract generally does not state the location of the customer's employees that will utilize the service or the extent to which each employee will utilize the cloud service. How does the supplier determine the place where the business customer is consuming the services? Is it where the business is established, where the business has a physical presence, where the business's employees are located, or some other location? Each alternative creates challenges for businesses trying to compute and

60. See *EY Roundtable*, *supra* note 8, at 47 (noting that this cross-over situation is not uncommon).

61. See Joel Waterfield, *TIP on Tax: How Cloud Computing Providers Can Weather the On-Going Tax Storm* 1, 3 (Mar. 1, 2013), <https://docplayer.net/967754-Tip-on-tax-how-cloud-computing-providers-can-weather-the-on-going-tax-storm.html>.

comply with their VAT obligations and for tax authorities' attempting to enforce VAT collection. Moreover, in many instances, one business may utilize the cloud services through many related entities located in various jurisdictions. What is the best proxy for the place of consumption under these circumstances when the contract only provides for one price and one point of contact?

The timing and anonymous nature of a typical cloud computing transaction further contributes to the difficulties in developing an appropriate proxy for the place of consumption of cloud services. Because cloud computing transactions are often concluded instantaneously between parties that do not know each other or have an insignificant amount of interaction, cloud service providers may not know the location of the customer in the short time frame available for collecting and remitting the appropriate amount of VAT to the correct tax authorities.⁶²

The unclear characterization of cloud computing transactions also creates challenges in determining the jurisdiction that has VAT taxing authority over the transaction, because most jurisdictions apply different place-of-supply rules to supplies defined as goods versus supplies defined as services, as well as to transactions characterized as B2B transactions versus B2C transactions.⁶³ Moreover, different rules may apply to different types of services and to different recipients of the service.⁶⁴

Although electronic commerce, in general, presents many similar issues,⁶⁵ cloud computing has enabled many businesses to offer cross-border services on a much larger scale, which has escalated the need for countries to address these issues.⁶⁶ This has resulted in different countries responding to the place-of-taxation question in different ways.

62. See Marie Lamensch, *Tax Assessment in a Digital Context: A Critical Analysis of the 2015 EU Rules*, in *VALUE ADDED TAX AND THE DIGITAL ECONOMY*, *supra* note 12, at 39, 41; Bal, *supra* note 52, at 345.

63. See Bal, *supra* note 52, at 345; Thomas A. Boniface et al., *Understanding VAT Obligations in the Cloud*, *J. INT'L TAX'N*, Aug. 2013, at 29, 30.

64. See Waterfield, *supra* note 61, at 4.

65. See Rifat Azam, *E-Commerce Taxation and Cyberspace Law: The Integrative Adaptation Model*, 12 *VA. J.L. & TECH.* 5 (2007).

66. See Donato Raponi & David O'Sullivan, *VAT and Taxation of the Digital Economy from the Perspective of the EU Policy Maker*, in *VALUE ADDED TAX AND THE DIGITAL ECONOMY*, *supra* note 12, at 11, 12.

Some countries have implemented specific place-of-taxation rules for electronically supplied services, which includes some cloud computing services, while others have not specifically addressed these questions. Even among those that have addressed the question of how to identify the place where the cloud computing services are consumed, the place-of-taxation rules either differ in their terms or in their application.⁶⁷

3. Collecting VAT: Registration and Compliance

Collecting and remitting the appropriate amount of VAT on cloud computing transactions is another challenging aspect of the application of current VAT systems to the new cloud environment. Because customers in a country can now easily receive cloud computing services in digital form from providers all over the world without any border controls, the foundations of the current enforcement regime are at risk. Countries have limited ability, resources, and enforcement power over foreign cloud vendors.

This feature also increases the number of cross-border transactions to private consumers, which creates enforcement challenges in the market jurisdiction, especially given the low-value nature of many of these transactions.⁶⁸ With ineffective enforcement, the risk of noncompliance grows. Noncompliance may also increase as a result of the heavy compliance burden that cloud vendors and other digital suppliers face in trying to determine their customer's location for VAT purposes.⁶⁹

In theory, jurisdictions could attempt to use the current registration-based VAT collection regime to assist with compliance and enforcement issues. Under the registration-based system, businesses register with the VAT administration, issue invoices to charge VAT based on the place of supply, collect the VAT, and remit it to the appropriate government authority. However, in the growing digital economy with businesses having customers in multiple jurisdictions and supply occurring worldwide, the current registration-based system puts onerous compliance burdens on suppliers.

67. See ECKER, *supra* note 9, at 39.

68. See *Action 1 Final Report*, *supra* note 1, at 147; Bal, *supra* note 52, at 348.

69. Traversa & Ceci, *supra* note 44, at 76.

4. Tackling Fraud and Avoidance Schemes

VAT-related fraud and avoidance represents another significant challenge in the cloud environment.⁷⁰ Although the issue of VAT-related fraud and avoidance is not unique to the cloud environment, the cloud environment creates new opportunities for VAT fraud and abuse, as well as facilitates many existing schemes.⁷¹ Several key characteristics of cloud computing transactions can facilitate certain types of VAT evasion and avoidance.⁷² In particular, by providing supplies virtually, the cloud environment enables the visibility of these transactions to diminish.⁷³ As a result, cloud computing transactions become more difficult

70. Generally, VAT fraud refers to tax evasion or failing to pay the full amount of VAT due through the use of fraud, concealment, or other illegal measures. See *OECD Guidelines*, *supra* note 9, at 109; Eur. Parliamentary Research Serv., *Bringing Transparency, Coordination and Convergence to Corporate Tax Policies in the European Union: I—Assessment of the Magnitude of Aggressive Corporate Tax Planning* 4 (Sept. 2015), [http://www.europarl.europa.eu/RegData/etudes/STUD/2015/558773/EPRS_STU\(2015\)558773_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/558773/EPRS_STU(2015)558773_EN.pdf). Common examples of VAT-related fraud include under-reporting sales or over-reporting deductions to reduce the VAT liability, overstating input credits to obtain inappropriate VAT refunds, inappropriately claiming to be a business customer to avoid direct payment of VAT, falsifying statements that result in VAT not being transferred to governments, and missing trader fraud.

VAT-related tax avoidance, on the other hand, does not involve the use of illegal measures to minimize a taxpayer's VAT liability. These transactions arise when a taxpayer generates a tax benefit by acting in a manner that literally complies with the text of the VAT rules but circumvents the rule's intended purpose. In practice, these transactions are difficult to precisely define and target because the abusive nature of the transaction ultimately depends on the facts and circumstances of the particular arrangement. See *OECD Guidelines*, *supra* note 9, at 109; Orly Sulami, *Tax Abuse—Lessons from Abroad*, 65 *SMU L. REV.* 551, 559 (2012).

71. In fact, the problem of VAT-related fraud and avoidance has existed since the adoption of the VAT. See SCHENK ET AL., *supra* note 17, at 311; Traversa & Ceci, *supra* note 44, at 67.

72. See *Action 1 Final Report*, *supra* note 1, at 144 (discussing how the digital economy exacerbates BEPS risks).

73. See OECD, *Technology Tools to Tackle Tax Evasion and Tax Fraud* 6–7 (Mar. 31, 2017), <https://www.oecd.org/tax/crime/technology-tools-to-tackle-tax-evasion-and-tax-fraud.pdf>.

to track, thereby increasing the ability of non-compliant taxpayers to conceal the true place of consumption, as well as to underreport the true amount of sales in a particular jurisdiction. For instance, a cloud vendor located in a particular jurisdiction may arrange its supply of cloud services so that it appears to be provided cross-border instead of to a local customer, thereby avoiding VAT in the market jurisdiction.⁷⁴ Fraudsters may also exploit this lack of visibility and the speed with which cloud transactions are completed to engage in missing trader fraud, which is a significant source of tax leakage in the EU and other community settings.⁷⁵

Moreover, because cloud services can be provided remotely, this facilitates the ease with which a business may channel the supply of digital services through low- or no-tax jurisdictions, which may enable a taxpayer to escape VAT in all jurisdictions.⁷⁶ As the volume of cloud offerings continues to increase, the failure to minimize VAT evasion and avoidance schemes further contributes to substantial revenue losses and trade distortions.⁷⁷

II. CURRENT APPROACHES

Recognizing the challenges that the digital economy poses for VAT systems, the OECD has developed internationally agreed principles, standards, and mechanisms to address the VAT treatment of international services and intangibles, including the provision of digital products (the “OECD Guidelines”), and has issued numerous other reports to address

74. See Traversa & Ceci, *supra* note 44, at 75.

75. Missing trader fraud is often also referred to as carousel fraud or missing trader intra-community fraud. This type of fraud generally takes advantage of cross-border trading rules that allow supplies to move between jurisdictions tax-free. See Richard Ainsworth & Musaad Alwohaibi, *The First Real-Time Blockchain VAT—GCC Solves MTIC Fraud*, 86 TAX NOTES INT’L 695, 697 (May 22, 2017); Richard Ainsworth, *VAT Fraud—Technological Solutions 1* (Bos. Univ. Sch. of Law, Working Paper No. 10-28, 2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1677997; *VAT Fraud: A Global Challenge*, VATBOX, <https://vatbox.com/wp-content/uploads/2018/01/VAT-Fraud-Jan-2018.pdf> (last visited May 30, 2019).

76. See *infra* Part II.D; see also Traversa & Ceci, *supra* note 44, at 75.

77. See Traversa & Ceci, *supra* note 44, at 76; Ronan McGivern et al., *E-Commerce in the European Union: Can the EU VAT Keep Pace with the Changing Economy?*, 89 TAX NOTES INT’L 449, 452 (Jan. 29, 2018).

some of these challenges.⁷⁸ At the national or regional level, the EU has been a leader in developing VAT rules to accommodate the growing digital economy. It has implemented various rules and initiated multiple studies to maximize its VAT collection in this new digital era. The following section discusses some of the OECD's and EU's responses to the challenges raised by the digital economy, which affect many cloud transactions, and our analysis of these approaches.

A. Characterizing the Transactions

The OECD and EU have each taken steps to resolve the characterization challenges created by this new, digital world. Each of these approaches make important progress in this area, while also highlighting the difficulties that exist in fully addressing the characterization issues of the digital economy.

1. OECD Approach

The OECD explicitly has endorsed the position that digital supplies are considered services for VAT purposes.⁷⁹ Instead of providing a special definition for electronically supplied services, the OECD considers the supply of all digital products as services. Therefore, most cloud computing transactions are classified as services for VAT purposes. This means that in our Microsoft example above, the digital products provided by Microsoft to subscribers *A* and *B* are classified as services, and all applicable VAT rules on services should be implemented. Although this approach is positive in that it clarifies the proper characterization of digital supplies, treating all digital supplies as services oversimplifies the true characteristics of these transactions and could cause distortions in tax treatment. An approach that specifically defines electronically

78. *OECD Guidelines*, *supra* note 9, at 3. "These Guidelines were intended to set the standard for countries when designing and administering their domestic rules." *Id.*

79. See OECD, *Consumption Tax Aspects of Electronic Commerce* (2001), <http://www.oecd.org/tax/consumption/2673667.pdf> [hereinafter OECD, *Consumption Tax Aspects*]; OECD, *Electronic Commerce: Taxation Framework Conditions* (1998), <https://www.oecd.org/ctp/consumption/1923256.pdf> [hereinafter OECD, *Electronic Commerce*].

supplied products or services is likely to better minimize these types of distortions.

As to the characterization of the recipient of cloud computing services as a business versus a consumer, the OECD has made numerous recommendations throughout the years. In its early work on e-commerce, the OECD suggested that VAT registration numbers could and should be used to verify the status of e-customers.⁸⁰ However, in the absence of a global system of authentication, these VAT registration numbers cannot be checked and authenticated on a real-time basis, which limits the effectiveness of these numbers in the context of international transactions.

More recently, the OECD in the OECD Guidelines provides that “the identity of the customer is normally determined by reference to the business agreement.”⁸¹ Building on this recommendation, the OECD also provides an analysis of various approaches for determining and evidencing the status of the customer.⁸² This work provides a list of indicative factors that countries could require suppliers to use for purposes of determining the customer’s status, such as a VAT identification number, a certificate issued by the customer’s competent tax authority, information available in commercial registers, and commercial indicia that may provide reliable indication of the status of the customer.⁸³ This approach is making progress in the right direction.

2. EU Approach

The EU has taken a different approach to address the difficulties that arise when trying to classify digital products into traditional characterizations

80. OECD, *Electronic Commerce*, *supra* note 79. The OECD has also previously suggested that e-customers communicate their business status with the e-suppliers and that the e-suppliers should verify the information on a transaction-by-transaction basis, and also offered to continue to research and consider alternatives means to verify the business status of a customer, such as through the use of electronic certificates. *See* OECD, *Consumption Tax Aspects*, *supra* note 79.

81. *See* OECD Guidelines, *supra* note 9, at 42.

82. *See* OECD, *Mechanisms for the Effective Collection of VAT/GST Where the Supplier Is Not Located in the Jurisdiction of Taxation* (2017), <https://www.oecd.org/tax/tax-policy/mechanisms-for-the-effective-collection-of-VAT-GST.pdf>.

83. *Id.* at 32.

for VAT purposes. In particular, the EU has introduced a new category of services: “electronically supplied services.”⁸⁴ According to the EU VAT Directive, “electronically supplied services” (ESS) include “services which are delivered over the internet or an electronic network and the nature of which renders their supply essentially automated and involving minimal human intervention, and impossible to ensure in the absence of information technology.”⁸⁵ The EU VAT Directive also includes specific examples of ESS, such as (i) “the supply of digitised products generally, including software and changes to or upgrades of software”; (ii) “services providing or supporting a business or personal presence on an electronic network such as a website or a webpage,” among several other examples.⁸⁶ Based on this general definition and the given examples, it is very likely that most cloud computing transactions fall under the definition of ESS.⁸⁷

As to the challenge of characterizing the customer as a consumer or business, the EU’s main approach to manage this issue relies on the VAT Registration or Identification Number (VRN or VIN) of the customer. Under this system, if the customer provides a valid VRN or VIN, the customer is considered a business and the reverse charge method applies for VAT purposes.⁸⁸ If the customer does not provide a VRN or VIN, VAT authorities, in some cases, would allow reliance on

84. Council Implementing Regulation 282/2011, *supra* note 54, art. 7. The EU VAT Directive also introduced a special scheme for “telecommunications services” and “broadcasting services.” *See id.*

85. *Id.* Without this special definition for “electronically provided services,” most cloud computing transactions would likely be characterized as the supply of services under the general characterization rules provided by the EU Directive.

86. *See also* Council Implementing Regulation 1042/2013 of 7 October 2013 Amending Implementing Regulation (EU) No 282/2011 as Regards the Place of Supply of Services, 2013 O.J. (L 284) 1.

87. This conclusion is in line with a comprehensive study of the European Commission that analysed VAT legislation in all 28 EU Member States and found that cloud computing transactions fall under the interpretation of ESS. *See* Eur. Comm’n, *Interim Report of the Study SMART 2013/0042 on Analysis of Business Perceptions of the Tax Aspects of Cloud Computing* 49 (Sept. 18, 2014) (on file with authors).

88. *See* Council Implementing Regulation 282/2011, *supra* note 54, at 2 ¶ 19 & art. 4.

other evidences such as a referral to the website of the customer.⁸⁹ However, if the customer does not provide the appropriate evidence of being a business, the supplier must characterize the customer as a consumer, collect the VAT, and remit the VAT according to the special scheme for electronically supplied services.

The EU approach raises some concerns with respect to the ability to authenticate the recipient's declaration of himself as a business and the VRN/VIN that he provides. Under the EU's VAT Information Exchange System (VIES), foreign businesses can verify the validity of a VAT number issued by any EU Member State by selecting that Member State from the drop-down menu provided and entering the number to be validated.⁹⁰ However, customers can easily provide false data, manipulate the system, and conduct several schemes of VAT fraud.⁹¹ Thus, even with the use of VIES, e-suppliers cannot effectively ascertain that a VAT number used by an e-customer belongs to that e-customer.⁹²

B. Locating the Place of Supply

Given the current VAT model, the OECD and EU have also made some promising progress in attempting to grant VAT taxing authority to the appropriate jurisdiction. In particular, the adoption of the destination principle by both the OECD and EU, like many other jurisdictions, is a positive development in VAT tax policy.⁹³ This political consensus contributed substantially to developing coordinated VAT rules for the

89. See, for example, the UK VAT Guidelines: *Vat Rules for Supplies of Digital Services to Consumers in the EU: Defining Digital Services*, HM REV. & CUSTOMS, <https://www.gov.uk/government/publications/vat-supplying-digital-services-to-private-consumers/vat-businesses-supplying-digital-services-to-private-consumers#define-digital> (last updated Nov. 19, 2018).

90. *VIES VAT Number Validation*, EUR. COMM'N http://ec.europa.eu/taxation_customs/vies/?locale=en (last visited May 30, 2019).

91. See, e.g., Richard Thompson Ainsworth, *Black Swans: Recapitulative Statements/VIES (VAT) & Use Tax Reciprocity (RST)* 2 (Bos. Univ. Sch. of Law, Working Paper No. 12-10, 2012), https://scholarship.law.bu.edu/cgi/viewcontent.cgi?article=1053&context=faculty_scholarship.

92. See Lamensch, *supra* note 53, at 22.

93. See *OECD Guidelines*, *supra* note 9; Hellerstein, *supra* note 57, at 305; Lamensch, *supra* note 62, at 65.

digital economy through the VAT/GST guidelines and BEPS Action 1.⁹⁴ By adopting this principle, the economic efficiency and neutrality of cross-border trade is likely to improve, because the same tax rules apply to suppliers regardless of the supplier's jurisdiction.⁹⁵ This is especially important given the rise in cloud computing, because the cloud environment facilitates the ease with which suppliers can locate their business in a low VAT jurisdiction. Despite this progress, implementing the destination principle in practice continues to create considerable practical difficulties and raises significant enforcement issues.⁹⁶

1. OECD Approach

In accordance with the international consensus, the OECD Guidelines set forth place-of-taxation rules for cross-border supplies of services and intangibles that seek to allocate taxing authority to the country where final consumption is expected to occur.⁹⁷ These place-of-supply rules apply various proxies to determine the jurisdiction of consumption of various services and intangibles that would be difficult to otherwise ascertain.

With respect to B2B transactions involving internationally traded services or intangibles, the general rule treats the customer's location as the appropriate proxy for the place of consumption.⁹⁸ To identify this location, the OECD provides that a supplier can generally look to the parties' business agreement.⁹⁹

This query becomes more complicated when the customer has establishments in more than one jurisdiction. To illustrate the complexity that a multiple use entity creates, consider the plight of a U.S. cloud vendor that provides a bundle of virtual IT resources to a multinational

94. In contrast, the absence of political agreements on income taxation of the digital economy is one of the main reasons for the failure of the international tax regime to cope with the digital economy.

95. See *OECD Guidelines*, *supra* note 9, at 15 ("The key economic difference between the two principles is that the destination principle places all firms competing in a given jurisdiction on an even footing whereas the origin principle places consumers in different jurisdictions on an even footing.")

96. See *OECD Guidelines*, *supra* note 9; Hellerstein, *supra* note 57, at 305; Lamensch, *supra* note 62, at 65.

97. *OECD Guidelines*, *supra* note 9, at 38.

98. *Id.* at 41.

99. *Id.* at 42.

enterprise (MNE) headquartered in Ireland. The Irish MNE has related entities established in Germany, Singapore, and Mexico that each employ people who access the cloud services online from various locations worldwide. To which country should the U.S. cloud vendor remit the VAT payment?

In this case, the OECD Guidelines would require “the taxing rights accrue to the jurisdiction(s) where the establishment(s) using the service or intangible [for the purpose of its business operations] is (are) located.”¹⁰⁰ Because the establishments using the cloud services, in the example above, are located in Germany, Singapore, and Mexico, the cloud vendor would have to calculate, collect, and remit the appropriate VAT to these three jurisdictions. Because the cloud service provider may not necessarily know which of the MNE’s subsidiaries will actually use the cloud services and to what extent each subsidiary will use the services, the OECD Guidelines suggest that the recharge method, which relies on the customer’s internal recharge arrangements, should be used to allocate the taxing rights over the cost of an externally acquired service or establishment to jurisdictions where the establishments of use are located.¹⁰¹ Under certain circumstances, the OECD Guidelines also permit the entity to use a cost allocation or apportionment method that estimates the actual usage by each establishment.¹⁰²

The OECD Guidelines also set forth specific place-of-supply rules for B2C transactions involving internationally traded services or intangibles. These rules provide that the customer’s location is granted

100. *Id.* at 45.

101. *Id.* Pursuant to the recharge method, in the example above, the taxing rights over the cloud computing transaction first would be allocated to Ireland, which is the location of the customer’s establishment that contracts for the cloud services with the cloud vendor on behalf of the MNE group. *Id.* at 57. The OECD Guidelines recommend that this establishment be initially liable for any tax due on the transaction. *Id.* at 58. Next, the Irish entity would internally charge its related entities for the use of the external cloud services and apply the VAT to this recharge. Accordingly, the German, Singapore, and Mexican entities would each be liable for any VAT due on recharge. *Id.* at 58–61.

The OECD Guidelines also suggests that simpler methods, such as the direct use approach or the direct delivery approach, may be preferable in situations that do not involve multiple use of the service or intangible by several related entities. *Id.* at 46.

102. *See id.* at 61.

taxing rights over internationally traded services or intangibles.¹⁰³ For non-business customers, the customer's usual residence is generally used as the proxy for the customer's location.¹⁰⁴ Thus, in the case of an individual that lives in Spain, has a German bank account, and accesses software online in multiple jurisdictions, the general rule would require the cloud vendor to remit the VAT to Spain, the consumer's usual residence.

Determining the customer's usual residence may be difficult in the e-commerce context given the "high-volume, low-value supplies that rely on minimal interaction and communication between supplier and its customer."¹⁰⁵ Accordingly, the OECD Guidelines suggest that information provided by the customer may constitute evidence of the customer's usual residence.¹⁰⁶ This means that a cloud service supplier may determine the customer's usual residence on the basis of information collected as part of the ordering process, such as the customer's address, country of bank account, credit card information, and the internet protocol address of the device used to download digital content as well as other relevant information.¹⁰⁷ This approach is a step in the right direction in that many of the place-of-supply rules adopted by the OECD can be applied by suppliers on an automated basis, which can help minimize the suppliers' compliance burden.

The OECD Guidelines recommend using an alternative proxy to allocate taxing rights for both B2C and B2B transactions when the customer's location does not give rise to the appropriate tax result and an alternative proxy would lead to a "significantly better result."¹⁰⁸ The OECD Guidelines set forth a framework for determining whether a

103. *Id.* at 66. This is the residual rule and is likely to apply most frequently to cloud computing transactions. A separate rule exists for supplies consumed in the same jurisdiction in which they are physically provided as well as for supplies of services and intangibles directly connected with tangible property. *Id.* at 66–67, 83–87.

104. *Id.* at 69.

105. *Id.* As a result, the OECD Guidelines suggest that "jurisdictions should provide clear and realistic guidance for suppliers on what is required to determine the place of usual residence of their customers in a business-to-consumer context." *Id.*

106. *Id.* at 70.

107. *Id.* This list is not exhaustive, and other items of evidence may become relevant as technology and business practices change over time. *Id.*

108. *Id.* at 79.

departure from the general place-of-taxation rule is necessary but note that such departure should be limited to the greatest extent possible.¹⁰⁹ Applying this framework to the cloud computing context suggests that it is likely that a cloud service provider should rarely have to rely on an alternative proxy to allocate taxing rights to the provision of the cloud services.¹¹⁰ Thus, even though the customer's usual residence may not be sufficiently accurate in predicting the place of final consumption, an alternative proxy that provides more accurate results is likely to be inefficient and overly burdensome from an administrative perspective.

2. EU Approach

The EU for many years has already had specific place-of-supply rules for telecommunications, broadcasting, and electronically supplied services, which encompass many digital transactions, including the majority of cloud computing transactions. These rules, as recently updated, provide that in both B2B transactions and B2C transactions, the taxing rights are allocated to the country where the customer is located.¹¹¹

More specifically, in the case of B2B transactions, the general rule is that the customer's location is the country where the business customer is established.¹¹² This location is generally presumed to be the place where the functions of its central administration are carried out unless the supplier provides the services to a fixed establishment of the

109. *Id.* at 80.

110. The examples of circumstances where an alternative proxy might be desirable in a B2B context require that: (i) the supply of services or intangibles is made to both businesses and final consumers, (ii) the physical presence of both the supplier and recipient is necessary, and (iii) the service is used at a readily identifiable location. *Id.* at 82. Similarly, the examples of circumstances where an alternative proxy might be desirable in a B2C context involve situations where services and intangibles are performed at a readily identifiable location that requires the physical presence of the consumer, such as the provision of internet access in an internet cafe. *Id.* at 83.

111. Council Directive 2008/8, of the European Union of 12 February 2008 Amending Directive 2006/112/EC as Regards the Place of Supply of Services, 2008 O.J. (L 44) 111 (EC).

112. *Id.* art. 44. This same place-of-supply rule applies to all services. It is not limited solely to telecommunications, broadcasting, and electronic services. *See id.*

business located elsewhere.¹¹³ However, whenever a supplier provides the services to a business or “taxable person” established in a different Member State, the VAT accounting and payment liability shifts to the customer, through the reverse charge mechanism.¹¹⁴ Pursuant to this mechanism, the customer reports both their purchase and the supplier’s sale on their VAT return.¹¹⁵ Accordingly, in the event that a taxable business customer has multiple establishments using the cloud services, the cloud vendor may be able to shift the VAT reporting obligations on the customer.

In the case of B2C transactions involving the supply of telecommunications, broadcasting, and electronically supplied services, the customer’s location is generally the country where the customer has his permanent residence or usually resides (when the customer is a natural person)¹¹⁶ or the country where the customer is established (when the customer is a legal person).¹¹⁷ The EU place-of-supply rules contain a list of rebuttable presumptions to assist suppliers in identifying the customer’s location.¹¹⁸ Because these presumptions only apply in limited

113. See Council Implementing Regulation 282/2011, *supra* note 54, art. 21; Council Directive 2008/8, *supra* note 111, art. 44. In the event that neither a place of establishment nor a place of fixed establishment exists, the place of supply is considered to be the place where the business is registered. *See id.*

114. Council Directive 2006/112, *supra* note 30, art. 196.

115. See Directorate-General for Tax’n & Customs Union (Eur. Comm’n), *Explanatory Notes on the EU VAT Changes to the Place of Supply of Telecommunications, Broadcasting and Electronic Services that Enter into Force in 2015*, at 47 (2014), https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/vat/how_vat_works/telecom/explanatory_notes_2015_en.pdf [hereinafter *Explanatory Notes*].

116. In situations where the customer has both a permanent residence and a usual residence, the priority is given to the place of usual residence. Council Implementing Regulation 1042/2013, *supra* note 86, art. 24. This rule helps address the issue of how to determine the place of taxation of customers having multiple locations.

117. *Id.* As of January 1, 2015, the provision of telecommunications, broadcasting, and electronic services are taxed in the country where the customer belongs regardless of whether the services are provided within Europe or abroad. Council Directive 2008/8, *supra* note 111, art. 5. In the case of B2C transactions involving other services, the place of supply is generally based on the supplier’s location. *Id.*

118. *Explanatory Notes*, *supra* note 115, at 55, https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/vat/how_vat_works/telecom/explanatory_notes_2015_en.pdf. For instance, where

circumstances, cloud vendors are likely to rely more often on the general presumption set forth by the EU VAT rules. This presumption allows suppliers to identify the location of the customer in B2C transactions on the basis of two items of non-contradictory evidence.¹¹⁹ Permissible evidence includes, but is not limited to: “(a) the billing address of the customer; (b) the internet protocol (IP) address of the device used by the customer or any method of geolocation; (c) bank details such as the location of the bank account used for payment or the billing address of the customer held by that bank; (d) the Mobile Country Code (MCC) of the International Mobile Subscriber Identity (IMSI) stored on the Subscriber Identity Module (SIM) card used by the customer; (e) the location of the customer’s fixed land line through which the service is supplied to him; [and] (f) other commercially relevant information.”¹²⁰

Although these presumptions are useful in that they provide suppliers with more guidance for complying with their VAT obligations,

cloud computing services are supplied at certain physical locations, such as at a Wi-Fi hot spot, an internet café, a restaurant, a hotel lobby, or any other location that requires the physical presence of the recipient to receive the supply, the cloud vendor may presume that this physical location is the customer’s location and the place of taxation. *See* Council Implementing Regulation 1042/2013, *supra* note 86, art. 24a. Similarly, a cloud vendor that provides electronically supplied services via mobile networks or through a fixed land line can presume the customer is located in the country indicated by the mobile country code attributed to the SIM card used to receive the cloud services or at the location of the fixed land line, respectively. *See id.* art. 24b. A specific presumption also applies where a decoder or similar device is needed to receive the services or when services are provided to customers on a ship, aircraft or train carrying out passenger transport operation. *Id.*

119. *See The Basic EU VAT Rules for Electronically Supplied Services Explained for Micro Businesses*, EUR. COMM’N 3, https://ec.europa.eu/taxation_customs/sites/taxation/files/information_microbusinesses_euvat_2015_en.pdf (last visited May 31, 2019); Council Implementing Regulation 1042/2013, *supra* note 86, art. 24b(d). A supplier may rely on this general presumption when the specific presumptions regarding customer location are unavailable to use either because they are not applicable or the supplier does not have and could not have collected the information that would fulfill the conditions for the specific presumption to apply. *Id.*

120. *Id.* art. 24f. This is a non-exhaustive illustrative list of permissible evidence, which can either be used to determine the customer’s location under the general presumption or to rebut the customer’s location under a specific presumption. *Id.*

these rules can be cumbersome when applied to some cloud computing services. For instance, a cloud vendor that provides online access to its software to a non-taxable entity whose billing address is in Spain, has a German bank account, and who accesses the software online in the United Kingdom would need to acquire two items of permissible and non-contradictory evidence of the final consumer's residence. In this situation, the billing address suggests the consumer's residence is Spain, the bank details of the bank used for payment suggest the residence is Germany, and the IP address of the device used by the customer suggests the consumer's residence is the United Kingdom. Thus, to comply with the EU VAT rules, the cloud vendor would need to seek out an additional item or items of evidence to support one of these locations before it can compute and remit the appropriate amount of VAT due on the supply of the cloud services. Moreover, the cloud vendor would not be able to solely rely on the factual information provided by the customer but would also have to verify these items of evidence by "normal commercial security measures."¹²¹

Despite the foregoing, certain circumstances provide for a different location to govern the place of taxation of these types of services. The EU VAT rules allow a supplier to rebut a particular presumption using three items of non-contradictory evidence that prove the place of supply is a different location.¹²² The tax authority may also rebut a legal presumption relied on by the cloud service provider if it determines that there has been misuse or abuse by the supplier.¹²³ In addition, to prevent double taxation, non-taxation, or distortion of competition, Member States may completely override the legal presumptions and the taxation at the customer's location, by treating the place of supply as the place where effective use and enjoyment of the services takes place.¹²⁴ It is unclear under what circumstances a Member State would choose to use this provision to shift the appropriate place of taxation either within or outside of the EU.

121. Council Implementing Regulation 282/2011, *supra* note 54, art. 20.

122. *Explanatory Notes*, *supra* note 115, at 55.

123. Council Implementing Regulation 1042/2013, *supra* note 86, art. 24d. The customer, however, may not rebut a presumption even if the customer's actual location is different than the place of taxation identified by the presumption. *Explanatory Notes*, *supra* note 115, at 64.

124. See Council Directive 2008/8, *supra* note 111, art. 59a.

C. Collecting VAT: Registration and Compliance

Both the OECD and EU are aware of and working diligently to address the difficulties in enforcing and collecting VAT. Their initiatives, such as a simplified registration system, have enhanced VAT collections and been successful in many respects.¹²⁵ However, additional modifications and improvements to this registration system, as well as new measures that impose collection duties on intermediaries are necessary to effectively handle the unique challenges of the digital economy.

1. OECD Approach

The OECD Guidelines currently propose to use registration as the main collection method for B2C transactions and the reverse charge mechanism for B2B transactions.¹²⁶ But, in light of the compliance burdens that non-resident suppliers confront in this current economy, the OECD Guidelines have also recommended simplifying the current registration systems to improve collection.¹²⁷ These simplified registration-based collection systems appear to be successful in improving compliance among foreign suppliers of digital services and goods. This is partially because “the high-profile operators, which occupy a considerable part of the market, wish to be seen to be tax-compliant notably for reputational

125. In the United States, the Streamlined Sales Tax Project has also made commendable progress in this area. The Streamlined Sales Tax Project aims to simplify the states’ Retail Sales Tax systems through uniform definitions of certain sales and use tax related terms, uniformity of state and local tax bases, and simplification of state and local tax rates and the use of technology. It also enables one online registration with all states participating in the Streamlined Sales Tax project and eliminates the need to remit taxes to local jurisdictions by providing for state level administration of sales and use taxes. However, reporting and remitting the tax are still not centralized across states. The project also provides for the use of certified automated systems and service providers to aid in the administration of sales and use tax collections and provides for monetary allowances for new technological models. *Streamlined Sales and Use Tax Agreement*, STREAMLINED SALES TAX GOVERNING BD. (as amended through May 3, 2018), https://www.streamlinedsalestax.org/docs/default-source/agreement/ssuta/ssuta-as-amended-2018-05-03.pdf?sfvrsn=c5876d7_11.

126. See *OECD Guidelines*, *supra* note 9, at 71.

127. See *id.*

reasons.¹²⁸ Nevertheless, these methods have not been enough on their own to address the collection challenges of the digital economy.

To address these shortcomings, the OECD has suggested other possible collection mechanisms on foreign supply of intangibles and services.¹²⁹ Significantly, it has also recognized the critical need for international cooperation to reinforce VAT collection capacity on cross-border transactions and has included an analysis of frameworks of cooperation in the OECD Guidelines.¹³⁰

In addition, to improve VAT collection, the OECD has also suggested lowering the VAT exemption threshold currently applied in many countries on the imports of low-value goods.¹³¹ To achieve this result, the OECD, in its BEPS Report, concludes that a range of possible approaches are available to simplify VAT collection, especially on low-value goods. However, it gives special preference to collection through registration and intermediaries.¹³² Among the possible intermediaries, the BEPS Report endorses the use of e-commerce platforms and express carriers as VAT collecting intermediaries.¹³³

Significantly, the BEPS Report does not support the use of financial institutions to facilitate VAT collection. We do not agree with the analysis and the general conclusion that financial institutions should not be used to facilitate VAT collection, especially in the context of cloud computing transactions. According to the BEPS Report,

[t]he VAT/GST collection and remittance by financial intermediaries would need deep changes in the data collection and processing systems, since these intermediaries currently do not collect the relevant information for the assessment and payment of the VAT/GST and do not have systems in place to support the remittance of the tax in the jurisdictions of importation. It is therefore unlikely that financial intermediaries could play a role

128. See *Action 1 Final Report*, *supra* note 1, at 122.

129. See OECD, *Mechanisms*, *supra* note 82.

130. See *OECD Guidelines*, *supra* note 9, at 77, 103.

131. See *Action 1 Final Report*, *supra* note 1, at 123–26. The rise of e-commerce and cloud computing have substantially increased these types of imports, which risks the VAT base and distorts competition. See *id.*

132. *Id.* at 123–26, 181–219.

133. *Id.* at 204.

in a more efficient collection of VAT/GST on imports of low value goods.¹³⁴

Although it is true that imports of small assignments are increasing, these imports are also becoming more digital. Without physical components, border controls and carriers can no longer be effective tools of enforcement.

Furthermore, in cloud computing transactions, the platforms are usually the suppliers of the services rather than intermediaries. In these circumstances, VAT enforcement mechanisms are more limited. Even though requiring registration of foreign suppliers would likely be effective with the large suppliers who dominate the market and care about their reputation and the threat of further regulations, this type of registration system would likely be ineffective for smaller suppliers who are not motivated by these types of incentives. Therefore, contrary to the BEPS Report, we believe that it is necessary to use intermediaries as a backup collection mechanism and, as further discussed below, financial institutions represent an effective and efficient type of intermediary to collect VAT on cross-border digital transactions.¹³⁵

2. EU Approach

To address some of the registration and compliance issues created by the digital economy, the EU has also focused on simplifying its registration system. Specifically, it introduced the EU Mini One Stop Shop (MOSS) regime.¹³⁶ According to the MOSS regime, businesses supplying telecommunication services, television and radio broadcasting services, or electronically supplied services to EU consumers can now register in one jurisdiction, the Member State of identification, and file VAT returns in this jurisdiction, instead of having to register in each jurisdiction of supply.¹³⁷ The Member State of identification then remits

134. *Id.*

135. See discussion *infra* Part III.C.

136. See Directorate-General for Tax'n & Customs Union (Eur. Comm'n), *Guide to the VAT Mini One Stop Shop* (2013), https://ec.europa.eu/taxation_customs/business/vat/telecommunications-broadcasting-electronic-services/sites/mossportal/files/mini-one-stop-shop-guidelines_en_1.pdf.

137. Council Implementing Regulation 1042/2013, *supra* note 86; Council Regulation 967/2012 of 9 October 2012, Amending Implementing

the VAT to all Member States of consumption according to the EU place-of-supply rules and rates.¹³⁸ The impacts of the MOSS regime are significant and have generally been seen by various constituents as a positive change to the current VAT system.¹³⁹ The new system allows Member States to collect tax on each other's behalf and has led to a collection of EUR 3 billion of VAT revenues in 2015.¹⁴⁰ The MOSS system has also reduced the overall cost of businesses utilizing the MOSS registration scheme and has resulted in a total saving for these businesses of about EUR 500 million.¹⁴¹ Studies reveal that the 2015 reform of the

Regulation 282/2011, 2012 O.J. (L 290) 1; Commission Implementing Regulation 815/2012 of 13 September 2012, Laying Down Detailed Rules for the Application of Council Regulation 904/2010, 2012 O.J. (L 249) 3; Council Regulation 904/2010 of 7 October 2010 on Administrative Cooperation and Combating Fraud in the Field of Value Added Tax, 2010 O.J. (L 268) 1.

138. Council Implementing Regulation 1042/2013, *supra* note 86; Commission Implementing Regulation 815/2012, *supra* note 137, art. 5; Council Regulation 904/2010, *supra* note 137, art. 41.

However, in cases where suppliers have a business establishment in a Member State, the MOSS scheme is unavailable for supplies made in that Member State. These suppliers must account for VAT in that Member State using the local VAT registration system. Council Regulation 967/2012, *supra* note 137.

139. See Directorate-General for Tax'n & Customs Union (Eur. Comm'n), *VAT Aspects of Cross-Border E-Commerce—Options for Modernization Final Report—Lot 3: Assessment of the Implementation of the 2015 Place of Supply Rules and the Mini-One Stop Shop* 8 (2016), https://ec.europa.eu/taxation_customs/sites/taxation/files/vat_aspects_cross-border_e-commerce_final_report_lot3.pdf [hereinafter *VAT Aspects of Cross Border E-Commerce*]; Dóra Krinis, *VAT Challenges of the Digital Economy—An EU Perspective* (Apr. 2016) (unpublished dissertation, Univ. do Minho), <https://repositorium.sdum.uminho.pt/bitstream/1822/42303/1/D%C3%B3ra%20Krinis.pdf>. However, the EU has identified the following as issues to be addressed in the future: “(1) the lack of a threshold for micro-enterprises, (2) the lack of awareness of the changes in some [Member States], (3) difficulties in identifying customers for some businesses (4) record keeping/B2C invoicing requirements, and (5) home country audits.” *Id.* at 66; see *Commission Staff Working Document Impact Assessment Accompanying the Document Proposals for a Council Directive, a Council Implementing Regulation and a Council Regulation on Modernising VAT for Cross-Border B2C E-Commerce*, COM (2016) 757 final (Dec. 1, 2016).

140. *VAT Aspects of Cross Border E-Commerce*, *supra* note 139, at 8.

141. See *id.* at 15.

VAT system and the introduction of the MOSS regime have also contributed to a significant reduction in the VAT Gap in the EU.¹⁴² Based on the assessment and success of these changes, the European Commission has adopted new legislation to extend the place-of-supply rules and the MOSS regime on certain B2C transactions.¹⁴³

142. See Grzegorz Poniatowski et al., *Study and Reports on the VAT Gap in the EU-28 Member States: 2017 Final Report*, CTR. FOR SOC. & ECON. RESEARCH 8 (Sept. 18, 2017), https://ec.europa.eu/taxation_customs/sites/taxation/files/study_and_reports_on_the_vat_gap_2017.pdf.

143. Council Regulation 2017/2454 of 5 December 2017 Amending Regulation (EU) No 904/2010 on Administrative Cooperation and Combating Fraud in the Field of Value Added Tax, 2017 O.J. (L 348) 1; *Commission Proposal for a Council Directive Amending Directive 2006/112/EC and Directive 2009/132/EC as Regards Certain Value Added Tax Obligations for Supplies of Services and Distance Sales of Goods*, at 2, COM (2016) 757 final (Dec. 1, 2016); *Expert Group on Taxation of the Digital Economy*, EUROPEAN COMM'N, https://ec.europa.eu/taxation_customs/business/company-tax/tax-good-governance/expert-group-taxation-digital-economy_en (last visited May 31, 2019)

For instance, the new legislation introduced a controversial de minimis threshold and eliminated the exemption for small consignments. See Council Directive 2017/2455 of 5 December 2017 Amending Directive 2006/112/EC and Directive 2009/132/EC as Regards Certain Value Added Tax Obligations for Supplies of Services and Distance Sales of Goods, 2017 O.J. (L 348) 7; see also Council Implementing Regulation 2017/2459 of 5 December 2017 Amending Implementing Regulation (EU) No 282/2011 Laying Down Implementing Measures for Directive 2006/112/EC on the Common System of Value Added Tax, 2017 O.J. (L 348) 32; Marie Lamensch, *European Commission's New Package of Proposals on E-commerce: A Critical Assessment*, 28 INT'L VAT MONITOR 137 (2017). This proposal, as well as other proposals, are part of a continuous process to reform the EU VAT according to the EU VAT Action Plan and as part of the general strategy toward a Digital Single Market. See *Proposal for a Council Directive Amending Directive 2006/112/EC on the Common System of Value Added Tax as Regards the Special Scheme for Small Enterprises*, at 1, COM (2018) 21 final (Jan. 18, 2018); *Proposal for a Council Directive Amending Directive 2006/112/EC as Regards Rates of Value Added Tax*, at 1–4, COM (2018) 20 final (Jan. 1, 2018); *Action Plan on VAT*, EUR. COMM'N TAX'N & CUSTOMS UNION, https://ec.europa.eu/taxation_customs/business/vat/action-plan-vat_en (last visited May 31, 2019); *Action Plan on VAT: Towards a Single VAT Area?*, EUR. FISCAL STUDIES (Feb. 22, 2018), <http://www.europese fiscale studies.nl/upload/EFS%20-%20Presentation%2022%20FEB%202018.pdf>.

A recent review and assessment of the MOSS and other simplified registration and collection mechanisms,¹⁴⁴ based on the EU assessment report,¹⁴⁵ found that the MOSS functions well from perspectives of both tax administrations and the business community. The data clearly reveals that a small number of large businesses accounted for the overwhelming majority of the revenues collected under MOSS. The report concluded,

The evidence, albeit still limited, supports the conclusion that simplified registration and collection regimes represent an effective approach to securing tax compliance when the taxpayer is not located in the jurisdiction of taxation. Based on the observations outlined above and recent experience, it is highly likely that an even greater number of jurisdictions will embrace simplified collection regimes in the future, especially in light of the growth of the digital economy and more particularly, B2C digital transactions.¹⁴⁶

In sum, the overall experience with the MOSS regime thus far shows that it is an effective and efficient regime for collecting VAT on e-services based on the destination principle. According to this regime, cloud computing services are usually considered electronically supplied services, and suppliers of these services are able to benefit from the MOSS regime. As we further elaborate below, we should learn from this regime and improve it to handle the challenges to VAT of cloud computing transactions.

D. Tackling VAT Fraud and Avoidance

The OECD and EU have each also made important and ongoing efforts to try to minimize VAT fraud and avoidance. Given that VAT is a major source of tax revenue in many jurisdictions, this type of tax evasion and

144. Walter Hellerstein et al., *Simplified Registration and Collection Mechanisms for Taxpayers That Are Not Located in the Jurisdiction of Taxation: A Review and Assessment* (OECD Tax'n Working Papers, No. 39, 2018), <http://dx.doi.org/10.1787/64bcf5de-en>.

145. See *VAT Aspects of Cross Border E-Commerce*, *supra* note 139.

146. Hellerstein et al., *supra* note 144, at 31.

avoidance substantially depletes government budgets and represents a significant cost to governments worldwide.¹⁴⁷ VAT-related fraud and avoidance also harms compliant businesses by increasing their costs relative to their non-compliant competitors and undermines the integrity of the VAT system as a whole.¹⁴⁸ Through their various approaches, the OECD and EU have made notable progress to target this type of tax leakage.

1. OECD Approach

The OECD has undertaken numerous initiatives to counteract VAT fraud and avoidance.¹⁴⁹ For instance, the most recent version of the OECD Guidelines contain provisions that seek to minimize opportunities for double taxation or unintended non-taxation, including tax avoidance opportunities that arise when an exempt business acquires remotely delivered services.¹⁵⁰ The OECD Guidelines also include recommendations for mechanisms for mutual cooperation, exchange of information and other forms of communication among tax administrations that can help address issues of VAT-related evasion or avoidance and urge further exploration of other potential mechanisms to address these types of issues.¹⁵¹ These mechanisms are expected to strengthen the already existing mechanisms such as the OECD Convention on

147. See OECD, *Technology Tools*, *supra* note 73, at 6; Eur. Comm'n Press Release IP/16/1022, VAT Action Plan: Commission Presents Measures to Modernise VAT in the EU (Apr. 7, 2016), europa.eu/rapid/press-release_IP-16-1022_en.pdf.

148. See OECD, *Technology Tools*, *supra* note 73, at 6; McGivern et al., *supra* note 77, at 453.

149. A complete discussion of all the work that the OECD has done to counteract tax fraud and tax avoidance is beyond the scope of this Article.

150. *Action 1 Final Report*, *supra* note 1, at 94; *OECD Guidelines*, *supra* note 9, at 64–67.

151. See OECD & Council of Eur., *Convention on Mutual Administrative Assistance in Tax Matters*, June 1, 2011, as amended, <http://www.oecd.org/ctp/exchange-of-tax-information/ENG-Amended-Convention.pdf>; *OECD Guidelines*, *supra* note 9, at 53, 105–07; Michael Walpole, *Tackling VAT Fraud*, 25 INT'L VAT MONITOR 258, 262 (2014).

Mutual Administrative Assistance in Tax Matters¹⁵² and the use of Tax Information Exchange Agreements (TIEAs).¹⁵³

Further, the OECD's Standard Audit File for Tax (SAF-T) provides another tool that facilitates information exchange and can help tax authorities police VAT abuse.¹⁵⁴ SAF-T sets forth an international standard for the electronic transfer of data from companies to tax authorities in order to improve tax authorities' ability to carry out audits, improve the reliability of the data, and simplify tax compliance for businesses.¹⁵⁵ If shared among tax jurisdictions and used on a more widespread basis, this could further assist with targeting potential VAT-related evasion and avoidance.

The OECD also continues to encourage development in this area. Most recently, in 2017, the OECD issued a report, which shares technology solutions that tax authorities in various countries have implemented to counter tax fraud and evasion and encourages the adoption of new or similar measures.¹⁵⁶ The report highlights how data recording technology can minimize sales suppression by immediately recording transactions.¹⁵⁷ Similarly, electronic invoicing and automatic reporting of data to the relevant tax authority can help counteract a company's ability to overstate its VAT-related deductions.¹⁵⁸ The report also

152. Pursuant to this Convention, countries may agree to exchange information on request or spontaneously regarding particular persons or transactions, participate in tax examinations in the foreign jurisdiction, as well as provide other administrative assistance. *See* OECD & Council of Eur. Convention, *supra* note 151, at 3; *OECD Guidelines*, *supra* note 9, at 106; Walpole, *supra* note 151, at 262.

153. The TIEA is a bilateral international agreement that is often based on the OECD's model TIEA. *See* *OECD Guidelines*, *supra* note 9, at 107; Walpole, *supra* note 151, at 262.

154. *See* OECD, *Guidance Note: Guidance for the Standard Audit File—Tax* (2005), <http://www.oecd.org/tax/administration/34910263.pdf>; *VAT Compliance*, *supra* note 6, at 22.

155. *See* OECD, *Guidance Note*, *supra* note 154, at 4–5. The OECD continues to make developments in this area and will likely review how the SAF-T is used in different jurisdictions in the near future. *VAT Fraud: A Global Challenge*, *supra* note 75, at 11.

156. *See* OECD, *Technology Tools*, *supra* note 73, at 6.

157. *See id.* at 11.

158. *See id.*

emphasizes that some countries have had success with data analytics combined with new forms of data collection to target the risks of tax evasion and fraud facilitated by the sharing economy.¹⁵⁹ In short, this important work concludes that based on the experience in numerous jurisdictions, certain technological solutions can minimize a country's VAT gap.¹⁶⁰ It recommends the use of technology as a powerful tool in addressing VAT evasion and sets forth the best practices a country should consider adopting when introducing a new technology solution.¹⁶¹

2. EU Approach

In the EU alone, 151 billion euros of VAT revenue are estimated to be lost annually to various forms of tax leakage.¹⁶² Of this number, 50 billion euros of lost VAT revenue is likely attributable to cross-border fraud.¹⁶³ Thus, it is no surprise that the EU, like many jurisdictions, has made combating VAT abuse an important priority and has introduced numerous preventative measures throughout the years with this goal in mind.¹⁶⁴

For instance, recognizing that many opportunities for VAT-related fraud and avoidance were attributable to the digital economy, the EU changed the manner in which the VAT rules apply to digital transactions.¹⁶⁵ In particular, the EU changed the place-of-supply rules of electronically supplied services to grant taxing rights to the country of the customer's residence instead of to the country where the supplier was registered.¹⁶⁶ This change improves the proxy for the place of

159. *See id.* at 23–25.

160. *See id.* at 6.

161. *See id.*

162. *See* Eur. Comm'n Press Release, *supra* note 147; Poniatowski et al., *supra* note 142, at 8.

163. Eur. Comm'n Press Release, *supra* note 147.

164. The following discussion includes only a sampling of some of the more recent measures introduced by the EU to tackle VAT fraud and avoidance. For a discussion of some other actions taken by the EU to fight against VAT fraud, see Traversa & Ceci, *supra* note 44, at 68–73.

165. John McCarthy et al., *Software as a Service to Comply with VAT Requirements*, ENGINEERS J. (Mar. 24, 2015), <http://www.engineersjournal.ie/2015/03/24/taxamo-software-service-vat-requirements/>.

166. *See supra* Part II.B.2. In addition, the EU introduced the voluntary MOSS system to minimize the compliance burdens of suppliers. *See supra* Part II.C.2.

consumption, as well as helps minimize the ease with which suppliers could reduce VAT charges merely by relocating to a low-VAT jurisdiction. The enactment of these new rules have likely played a part in reducing the EU's VAT gap. However, to truly target VAT-related abuses, international cooperation remains necessary.¹⁶⁷

The EU has also sought to introduce various measures to increase information exchange among Member States to target VAT abuse.¹⁶⁸ Its current system, VIES, which enables suppliers to electronically validate the VAT status of their business customers established in the EU and provides the tax administration in the supplier's Member State with information regarding the identity and sales of cross-border customers in the EU, is a useful tool for exchanging data but also faces significant limitations that reduce its effectiveness at fighting VAT fraud.¹⁶⁹ Many types of VAT-related fraud can still go undetected because the transfer of VIES-collected information between Member States is primarily request-based, rather than automatic.¹⁷⁰ Furthermore, the information is not always accurate and reliable and is only useful for verifying the status of a business registered in the EU, but not abroad.¹⁷¹

In addition to these measures, the EU Commission has recently proposed a VAT Action Plan that presents several initiatives to improve data collection, data exchange and cooperation between EU Member States, as well as other changes intended to modernize the current VAT system.¹⁷² It proposes measures (some of which have recently been

167. See Eur. Court of Auditors, *Tackling Intra-Community VAT Fraud: More Action Needed* 26 (Mar. 4, 2016), http://www.europarl.europa.eu/cmsdata/99788/24_VAT_FRAUD_EN.pdf; Poniatowski et al., *supra* note 142, at 15–16.

168. See *VAT Fraud: A Global Challenge*, *supra* note 75, at 10.

169. Ainsworth & Alwohaibi, *supra* note 75, at 702. The EU also has other types of information exchange among Member States using standard forms, which are useful tools but may occasionally be hindered by untimely transfer of information. See Eur. Court of Auditors, *supra* note 167, at 22.

170. See Ainsworth & Alwohaibi, *supra* note 75, at 702; Walpole, *supra* note 151, at 262.

171. See Traversa & Ceci, *supra* note 44, at 80; Eur. Court of Auditors, *supra* note 167, at 25.

172. See *Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on an Action Plan on VAT Towards a Single EU VAT Area—Time to Decide*,

adopted) such as: (i) strengthening the role of the Eurofisc¹⁷³ to improve the exchange and joint risk analysis of key information; (ii) using new reporting and auditing tools for tax collection; (iii) eliminating the current VAT exemption for small supplies imported into the EU; (iv) permitting Member States to target MTIC fraud by temporarily suspending the reverse charge mechanism for supplies of goods and services above a threshold amount; and (v) seeking better public-private cooperation between tax administrations and logistics companies, internet platforms, payment service providers, and business associations in order to “improv[e] VAT collection [and] reduc[e] fraud in the field of e-commerce,” among other measures.¹⁷⁴ Although commendable in many respects, it is unlikely that these steps are enough to fight fraud in the EU given the inadequate amount of reliable and complete data available to tax authorities, the time lag with which it is available to them, the cumbersome process often involved, and the limited participation of Member States.¹⁷⁵

In addition, in March of 2018, the Council of the EU issued a directive that requires EU-based intermediaries and certain taxpayers to report any cross-border arrangement that contains certain “hallmarks” of tax avoidance or tax abuse.¹⁷⁶ Upon receiving this information, Member States must automatically exchange the reported information with

COM (2016) 148 final (Apr. 7, 2016); Eur. Comm’n Press Release, *supra* note 147. This new Action Plan is intended to be the first step in implementing a definitive EU VAT system that simplifies the VAT rules, targets VAT-related fraud, and treats domestic B2B transactions more in parity to cross-border B2B transactions. See Eur. Comm’n Press Release, *supra* note 147.

173. Eurofisc is a decentralized network of national officials set up to exchange targeted information on possible fraudulent VAT schemes and companies. *Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on the Follow-up to the Action Plan on VAT Towards a Single EU VAT Area—Time to Act*, at 5 n.10, COM (2017) 566 final (Oct. 4, 2017).

174. See *id.* at 4.

175. See Eur. Court of Auditors, *supra* note 167, at 26.

176. See *Commission Proposal for a Council Directive Amending Directive 2011/16/EU as Regards Mandatory Automatic Exchange of Information in the Field of Taxation in Relation to Reportable Cross-Border Arrangements*, COM (2017) 335 final (June 21, 2017); Robert Walker, *Proposed EU Reporting for Cross-Border Tax Planning Arrangements*, INT’L TAX BLOG (BNA) (Jan. 19, 2018), <https://webcache.googleusercontent.com/search?q=cac>

all other Member States through a centralized database, within one month from the end of the quarter in which the information is reported.¹⁷⁷ By providing tax authorities with advance information about potentially aggressive tax planning arrangements, this new initiative may be useful in helping to target perceived tax avoidance and aggressive tax planning.¹⁷⁸

In summary, the OECD and EU have each taken significant steps to address each of the challenges that the digital economy poses for our current VAT systems. Recent studies reveal that many of these measures have contributed to an increase in VAT revenues.¹⁷⁹ But, as our analysis above reveals, more work needs to be done to further improve VAT collection and enforcement with respect to digital transactions and to reduce the heavy compliance burden on suppliers.

III. RECOMMENDATIONS FOR REFORM

To address the challenges of cloud computing, VAT reform is essential. Below, we set forth several recommendations for VAT reform. The general goal of these proposals is to enable tax administrations to effectively collect VAT on cloud computing transactions in an efficient and fair manner that minimizes the compliance burdens on taxpayers.¹⁸⁰ To accomplish these important, but difficult goals, we propose three sets

he:P2B69cSjxJkJ:<https://www.bna.com/proposed-eu-reporting-b73014474309/+&cd=1&hl=en&ct=clnk&gl=us>.

177. See *Commission Proposal for a Council Directive Amending Directive 2011/16/EU*, *supra* note 176, at 12.

178. *Council of the EU Reaches an Agreement on New Mandatory Transparency Rules for Intermediaries and Taxpayers*, EY GLOBAL TAX ALERT (Mar. 14, 2018), <https://www.ey.com/gl/en/services/tax/international-tax/alert—council-of-the-eu-reaches-an-agreement-on-new-mandatory-transparency-rules-for-intermediaries-and-taxpayers>.

179. For instance, according to the recent interim report on tax challenges arising from digitization, “[a]n overwhelming majority of OECD and G20 countries have adopted rules for the VAT treatment of business-to-consumer (B2C) supplies of services and intangibles by foreign suppliers in accordance with the OECD International VAT/GST Guidelines. Early data shows that this has led to significant additional revenue in the adopting countries.” See *OECD Interim Report*, *supra* note 11, at 90.

180. In making our proposals, we adhere to the five policy goals established in the Ottawa Taxation framework: (i) Neutrality; (ii) Efficiency;

of reform: (i) technologies and intermediaries to improve the registration-based VAT system; (ii) real-time blockchain VAT systems; and (iii) the use of payment intermediaries to collect VAT. These three sets of suggestions can be arranged in a variety of combinations, any of which should be implemented gradually.

A. Improving the Registration-Based VAT System

In our first set of reform proposals, we suggest the use of different types of technologies and intermediaries to improve the current registration-based VAT system. As our analysis above illustrates, new uses of technology, such as the prevalent use of cloud computing, have put significant strain on our consumption tax systems. However, technology can also help address many issues raised by the digital economy. We argue that for our tax systems, and, in particular, the VAT system to continue to function effectively, it is critical that countries implement new technology solutions. Below, we suggest various technology options to help address the challenges presented by the digital economy.

1. Identity Authentication Technologies to Address Characterization Challenges

Characterizing cloud computing transactions for VAT purposes raises two main challenges for current VAT systems. To address the definitional challenge of goods versus services, we recommend the use of explicit and clear definitions. In particular, cloud computing transactions should be specifically added to the definition of ESS. The EU experience proves that introducing both specific and general definitions for ESS contributed to coping with this type of characterization challenge. Thus, explicitly including a general definition and detailed examples of cloud computing transactions provides an easy way to help cope with the challenges and specialties of cloud computing.¹⁸¹

(iii) Certainty and simplicity; (iv) Effectiveness and Fairness; and (v) Flexibility. OECD, *Electronic Commerce*, *supra* note 79, at 4.

181. See Lamensch, *supra* note 53. Australia and New Zealand have each recently implemented a “Netflix Tax,” which imposes GST on the sales of imported intangible supplies, including digital services and products to Australian and New Zealand consumers, respectively. See Tax and Superannuation Laws Amendment (2016 Measures No. 1) Act 2016 (Austl.),

To cope with the challenge of characterizing the customer as consumer or business, a more substantial improvement is necessary. We recommend one of two possible approaches to address this issue. One approach is to extend the use of the registration method to B2B transactions. Although serious debate exists regarding the pros and cons of the registration method versus the reverse charge method for taxing B2B digital transactions, given the rapid development of the digital economy, together with the development of the registration method over time, it may be the case that the registration method is now a more effective method than the reverse charge method for B2B transactions.¹⁸² Accordingly, we recommend that the registration method should be used for both B2B transactions and B2C transactions.

By implementing this type of system, a supplier would no longer have to characterize the recipient as a business or a consumer, thereby eliminating the characterization challenge that this distinction currently creates. Instead, under this type of system, the foreign supplier would issue an invoice, collect, and remit the VAT without any consideration of the recipient's characterization. In cases where the recipient is a business, the recipient would register with the appropriate jurisdiction, provide the appropriate evidence that he or she is a business, and then deduct the input VAT.

Alternatively, a second approach to address this characterization challenge is to improve the use of and reliance on technology to verify and authenticate the recipient's classification as a consumer versus a business. Several technologies could provide such evidence and authentication. For example, VAT administrations could issue electronic identity certificates to taxpayers that digitally and instantaneously authenticate the identity of the taxpayer and prove his or her status as a

<https://www.legislation.gov.au/Details/C2016A00052>; Taxation (Residential Land Withholding Tax, GST on Online Services, and Student Loans) Bill (N.Z.), <http://www.legislation.govt.nz/bill/government/2015/0093/latest/DLM6656113.html?src=qs>. According to the new legislation, the supplier or the aggregator of an electronic distribution platform are liable for collecting and remitting the tax and may have to register for GST. See Jeanne du Buisson & Divya Pahwa Deloitte, *GST on "Remote" Services*, DELOITTE (Apr. 2016), <https://www2.deloitte.com/nz/en/pages/tax-alerts/articles/gst-on-remote-services.html>. This change is beneficial in that it clearly encompasses most cloud computing transactions and clarifies that these types of supplies are taxable based on the residency of the consumer.

182. See *OECD Guidelines*, *supra* note 9, at 19, 52, 56, 73, 78.

business.¹⁸³ Such certificates would be a condition to qualify for business status in B2B cloud computing transaction. Another option would be the use of real-time taxation in which both sides report the transaction online as it occurs and account for the VAT outcomes in the relevant countries in a coordinated manner that leaves minimal tax gaps, shortages, and missing traders. As further explained below, comprehensive digital invoices mandated as a condition of the business license, combined with blockchain technology, could enable this type of real-time taxation and provide a means to authenticate the identification and characterization of the parties to the transaction.¹⁸⁴

2. Payment Intermediaries to Facilitate Locating the Place of Supply

Determining the place of final consumption in the cloud environment is both challenging and heavily burdensome to suppliers. The OECD and EU rules attempt to address this challenge primarily by using the customer's residence as a proxy for the place of consumption and allowing suppliers to rely on information acquired through the ordering process. However, due to the nature of the cloud environment, suppliers often face unreasonable compliance burdens in determining the customer's location within the short time-frame available to them to assess the appropriate VAT obligation. Thus, to tax cloud computing transactions and other remote, digital transactions more effectively in this digital age, we recommend that payment intermediaries could and should share the customer information they receive from the customer during the payment process. Allowing the exchange of this information would facilitate the accurate determination of the place of supply and the efficient collection of VAT, while also respecting and balancing customer privacy.

In particular, we suggest that the delivery of the VAT-facilitating data could work as follows: First, the supplier would send the payment intermediaries an electronic request to (i) verify the customer's country of residence as registered in their databases and (ii) process the payment. Next, the payment intermediaries' systems would provide an immediate and electronic response to the verification request and authorize the payment. Finally, once the supplier receives the verification of the

183. See OECD, *Consumption Tax Aspects*, *supra* note 79; Lamensch, *supra* note 53.

184. See *infra* Part III.A.4 & III.B.

customer's country, the supplier would then use it as evidence to apply the place-of-supply rules, determine the VAT jurisdiction, and collect and remit the VAT to the appropriate tax authorities.

Although the OECD explored and rejected this type of approach in a study conducted by the Technology Technical Advisory Group in 2000 (the TAG Report), we disagree with the report's conclusions and find its reasoning unpersuasive. Specifically, the TAG Report explored whether credit cards provide the necessary information to verify the place of consumption and concluded that severe commercial limitations make credit cards not viable for this purpose.¹⁸⁵ According to the TAG analysis, a credit card billing address does not always represent the place of residence or the place of consumption because online consumption could take place while travelling.¹⁸⁶ This assertion is true, but, in most cases, the credit card billing address represents the country of residency, and the majority of consumption generally occurs during residency rather than travel. Moreover, this same assertion can be made about the current approach taken by the OECD and EU that allows suppliers to use information provided by the customer during the ordering process, such as the customer's billing address.

The TAG Report also reasoned that the information transmitted from the credit card issuer to the merchant through the credit card's association is often limited to approving or declining the transaction, and no data is transferred or verified regarding the billing address.¹⁸⁷ To the best of our knowledge, this conclusion is not completely accurate. The customer's address or at least the zip code is generally given as part of the payment authorization process, which is verified by the credit card company to prevent fraud. We believe there is no clear reason why this same information could not also serve as a strong indicator of residency for VAT purposes. Thus, we disagree with the TAG Report's assertion that address verification systems "would not only be unreliable for the purpose of determining tax jurisdiction for consumption tax, but could also validate a false declaration."¹⁸⁸ On the contrary, this payment intermediary information seems less susceptible to a false declaration than the billing address and similar information that customers provide

185. See OECD, *Report by the Technology Technical Advisory Group (TAG)* (2000), <http://www.oecd.org/tax/consumption/1923248.pdf>.

186. See *id.* at 41.

187. *Id.*

188. *Id.* at 44.

during the ordering process, which are currently used for the purpose of determining tax jurisdiction.¹⁸⁹ For these reasons, we suggest that the address verification systems that were developed by credit card companies to limit fraud could and should be used to facilitate locating the customer's location for VAT purposes.

We also question several other conclusions made by the TAG Report. Specifically, the TAG Report claims that changing the authorization process to include data about a customer's address would be costly.¹⁹⁰ However, the TAG Report fails to provide any data about these costs. These costs are likely to be one-time costs that would contribute to collecting enormous amounts of VAT for a long period of time. Because the benefits of such a system are likely to outweigh the costs, governments may be willing to subsidize those costs.

Finally, we acknowledge that having credit cards verify the country of residence and share the information with suppliers for VAT purposes "raises privacy and confidentiality concerns."¹⁹¹ Thus, it is necessary to balance individuals' privacy concerns against the government's VAT collection concerns in a proportional manner. Our proposal seeks to achieve this balance by limiting the amount of private information that is transferred to the merchant. In particular, instead of providing the full billing address to the merchant, we suggest that credit card companies only share the country of residency with the supplier. This amount of information would limit the infringement of privacy while also providing the supplier with sufficient information with which to verify the customer's place of supply and apply the appropriate VAT rate.

3. VAT Administration Unions and Technology to Improve Compliance

To improve the imposition and collection of VAT on digital economy transactions, we recommend following the EU's approach with some modifications. The basic idea of the EU approach is to impose VAT

189. See OECD, *Consumption Tax Aspects*, *supra* note 79; Lamensch, *supra* note 53, at 23 ("Other indicators, like a billing address, seem even less reliable because the e-customer does not need the supplier to know where he or she resides, and giving a wrong billing address with the objective to obtain a lower VAT rate will have no consequence for the e-customer.").

190. OECD, *TAG Report*, *supra* note 185, at 44.

191. *Id.* at 42.

according to the place of the consumer and collect the VAT from cross-border transactions through a simplified registration regime that enables registration in one Member State, which collects and remits the VAT to the different Member States of consumption. As our analysis above reveals, this approach has been successful in many respects. Thus, we propose expanding this regime. However, to improve the system and enable it to better apply on a global basis and take into account the unique aspects of cloud computing, we propose several modifications.

First, because the world is not united like the EU and no tax directives oblige countries to act in a coordinated manner for tax purposes, the EU's approach to require the one-stop shop system would not work on a global basis without voluntary adoption by governments. This is not an insurmountable hurdle. Regional trade agreements, such as the North America Free Trade Agreement (NAFTA), are spread around the world and currently used for numerous purposes. The infrastructure of these agreements could be used for purposes of modifying the current VAT systems to require a registration system similar to that in place in the EU.

For instance, based on the model of these free trade cooperatives, countries could enter into VAT Administration Unions (VAU) agreements. Under these agreements, any business from outside the VAU that provides products or services to customers in the VAU would register with any member state of the VAU, collect VAT based on the place of the consumer, and file and remit the VAT to the member state of registration. Like the EU's One Stop Shop regime, the member state of registration would remit the VAT to the appropriate countries of consumption that are located within the VAU. In other words, we propose that countries establish unions for VAT collection purposes using the infrastructure of current international free trade agreements as a model. Establishing this type of VAT administration union would both improve VAT collection and facilitate free trade across participating nations.¹⁹²

Second, technology is an important tool and is necessary to improve VAT compliance. As our world becomes more digital so should our VAT systems. The EU and many other governments already require electronic filing of periodic VAT returns and provide for electronic payment of tax due.¹⁹³ This is an important first step. It reduces a supplier's

192. A detailed discussion of how to implement this type of system is outside the scope of this Article. Various issues would need to be taken into account and considered when negotiating this type of agreement.

193. See *VAT Compliance*, *supra* note 6, at 3.

compliance time and enables governments to better exploit the data captured by these returns for assessment and audit purposes.¹⁹⁴ However, advances in technology and the increasingly digital nature of our economy present us with an important opportunity to further digitalize the VAT process. This can generate significant benefits for both governments and taxpayers.

At a minimum, we strongly urge that, in addition to electronic filing and payment systems, countries adopt electronic invoicing systems and require businesses to use these digital invoices as a condition of the business license. Under this type of system, businesses would be required to digitally submit and sign encrypted transaction source data, such as invoices, in a uniform or standardized format to the appropriate tax authorities through the internet.¹⁹⁵ The appropriate tax authority would then be able to use an automated system to check the file for accuracy and completeness, save a copy of the file, and authorize the seller to transfer the verified invoice to the buyer and proceed with the transaction.¹⁹⁶ To be most effective, these transaction reporting systems should be set up to transmit the information to tax authorities automatically and in real time as each transaction occurs. One of the biggest deficiencies in the EU's VIES system has proven to be the delay in the timing of when the tax data is available to the tax authorities, as well as the aggregate nature of the data available.¹⁹⁷ Thus, a

194. According to a PwC study, it takes 27% less time on average to comply with VAT obligations in countries where suppliers pay and file VAT online. *VAT Fraud: A Global Challenge*, *supra* note 75. Moreover, a study by the European Commission indicates that Estonia's electronic tax services, which allows businesses to carry out all tax-related operations in a digital environment, helped to reduce the VAT tax gap to less than 5%. Teri Sprackland, *Bulgarian EU Presidency Promises More Action on VAT and Digital Taxation*, 89 TAX NOTES INT'L 145 (Jan. 8, 2018); Teri Sprackland, *Estonia's E-Tax Systems Credited with Closing VAT Gap*, 88 TAX NOTES INT'L 126 (Oct. 9, 2017).

195. See Richard T. Ainsworth & Goran Todorov, *Stopping VAT Fraud with DICE—Digital Invoice Customs Exchange*, 72 TAX NOTES INT'L 637, 639 (Nov. 18, 2013).

196. See *id.* (providing a detailed explanation of how a digital invoice and customs exchange system would work in practice).

197. See Richard T. Ainsworth, *Stopping MTIC—With a 3rd Invoicing Directive* (Bos. Univ. Sch. of Law, Working Paper No. 13-13, 2013), <https://ssrn.com/abstract=2260292>.

system, such as Brazil's digital invoicing system that transfers invoice-level data in real time into secure databases that match transactions and perform risk assessments, can significantly improve indirect tax compliance.¹⁹⁸

To ease the burdens of this new system, software systems can be developed to assist with the transmission of the appropriate billing data. For instance, Spain's new electronic invoicing system, the Immediate Submission of Information, enables taxpayers to electronically transmit billing records from VAT Books by using web services based on exchanging XML message or, if applicable, by filling out a web form.¹⁹⁹ In Portugal, certified invoice software enables companies to transfer invoice data to the Portuguese tax authorities online on a monthly basis in a standardized format.²⁰⁰ Similarly, China's "Golden Tax System" involves the use of government certified software to issue standardized invoices that are digitally certified and signed, which are then regularly submitted online by taxpayers to the tax authorities.²⁰¹

198. *See id.*

199. *See New VAT Management System Based on Immediate Supply of Information*, AGENCIA TRIBUTARIA, https://www.agenciatributaria.es/AEAT.internet/en_gb/Inicio/Ayuda/Modelos_Procedimientos_y_Servicios/Ayuda_P_G417_IVA_Llevarza_de_libros_registro_SII_/Informacion_general/Nuevo_sistema_de_gestion_del_IVA_basado_en_el_Suministro_Inmediato_de_Informacion.shtml (last visited May 31, 2019). In other words, this new system essentially requires taxpayers to keep their VAT Books online, rather than internally, and through a standardized method. *See id.* Taxpayers that use this system are relieved of filing certain VAT returns and are likely to experience less information requests from the tax agency. *See id.*

200. *See* Marta Andrade Póvoa, *Collaboration with Tax Service Providers in the E-Invoice System*, IOTA TAX 3 (Jan. 2018), https://www.iota-tax.org/sites/default/files/documents/iota-papers-_collaboration_with_the_tsp_portugal_final_updated.pdf.

201. *See Development of IT-Based Taxation*, ST. ADMIN. TAX'N CHINA, <http://www.chinatax.gov.cn/eng/n2367721/c2390193/content.html> (last visited May 31, 2019). This system has been updated several times to improve the interconnection among tax authorities, the data processing mechanism at a centralized level, among other measures. *See* Rose Zhou et al., "Golden Tax System Phase III"—China's "Internet+Tax" Era Opening, MONDAQ, <http://www.mondaq.com/china/x/531196/tax+authorities/Golden+Tax+System+Phase+III> (last updated Sept. 26, 2016).

A growing number of tax authorities worldwide have implemented these types of systems and have seen positive results.²⁰² Overall, each electronic invoicing system has increased the effectiveness and efficiency of VAT administration to varying degrees. By transferring high quality data to tax authorities in a standardized electronic format and on a more regular basis, these systems have improved the ability of the tax authorities to use data analytics, artificial intelligence, and other tools to review the veracity of the tax information.²⁰³ This, in turn, has helped to reduce the VAT gap by allowing tax authorities to

202. See *The Mandate Is Growing for E-Invoicing Adoption*, KPMG, <https://assets.kpmg.com/content/dam/kpmg/us/pdf/2017/10/mandate-for-e-invoicing-adoption-kpmg.pdf> (last visited May 31, 2019) (noting that “[c]urrently more than 55 countries have adopted, or are considering, e-invoicing mandates”); see also, e.g., Karen Lynch, *Brave New World*, TAX INSIGHTS FOR BUS. LEADERS, no. 20, 2018, at 44, 45 (Brazil is one of the earliest adopters of an electronic invoice system); Leandra Lederman & Joseph C. Dugan, *Information Matters in Tax Enforcement* 26–29 (unpublished) (on file with author) (describing numerous countries that have implemented these types of systems or that have taken steps in that direction); *Brazil: Corporate—Tax Administration*, PWC: WORLDWIDE TAX SUMMARIES, <http://taxsummaries.pwc.com/ID/Brazil-Corporate-Tax-administration> (last updated Jan. 14, 2019) (noting that Brazil’s system, known as the Public System of Digital Accounting, “unifies the activities of reception, validation, storage and legalization of records and documents that are part of the commercial and tax bookkeeping of companies, through a single computerized flow of data”); *Development of IT-Based Taxation*, *supra* note 201; Eva Ghirmai et al., *The Incidence and Impact of Electronic Billing Machines for VAT in Rwanda*, INT’L GROWTH CENTRE: BLOG (Apr. 15, 2016), <https://www.theigc.org/blog/the-incidence-and-impact-of-electronic-billing-machines-for-vat-in-rwanda/> (describing Rwanda’s implementation of an Electronic Billing Machine that provides customers with certified receipts and automatically transmits transaction data to the tax authorities on a real-time basis); *Mexican E-Invoicing: CFDI*, EDICOM, https://www.edicomgroup.com/en_US/solutions/einvoicing/LATAM_einvoicing/mexican_einvoicing.html (last visited Feb. 27, 2019) (describing Mexico’s “Comprobantes Fiscal Digital por Internet” (CFDI) system, which requires businesses to issue electronic invoices in a standardized format with appropriate certification and authorized digital signatures); *New VAT Management System*, *supra* note 199 (describing Spain’s recently implemented online invoicing system); Zhou et al., *supra* note 201 (describing China’s electronic invoicing system).

203. See *VAT Fraud: A Global Challenge*, *supra* note 75.

better identify VAT issues and conduct risk-based audits. Many of these systems also provide benefits to companies by reducing their compliance burdens and costs, as well as improving the VAT refund process.²⁰⁴ For instance, utilizing the electronic-invoicing system often minimizes the amounts of VAT reports that these companies later need to file, automates many of the components of VAT compliance, and generally reduces the number of information requests from tax authorities.²⁰⁵

In addition, digital invoicing is a critical first step for any effective exchange of encrypted key tax data to occur among relevant parties across tax jurisdictions or even within a single market.²⁰⁶ Having in place a comprehensive digital invoice system has enabled tax authorities to share relevant and accurate information with other jurisdictions on a timely basis. Doing so further enhances the effectiveness and efficiency of VAT administration and compliance by increasing the veracity of data collected, fostering the ability to use that data to better counteract VAT fraud and abuse, improving revenue collections and fair competition between VAT paying businesses, and further reducing the suppliers' burden in calculating, collecting, and remitting the appropriate VAT payment to the correct tax jurisdiction.²⁰⁷

Several mechanisms exist for how to achieve this type of real-time reporting and exchange of information regime. One effective mechanism is a digital invoice customs exchange (DICE) system proposed by Richard Ainsworth and Goran Todorov.²⁰⁸ In particular, to share and validate tax data, DICE uses digital invoices that are automatically transmitted to the relevant tax authorities in the appropriate jurisdictions at the time of the transaction.²⁰⁹ The relevant tax authorities must validate and digitally sign the invoice through the use of public access keys before

204. See *VAT Compliance*, *supra* note 6. However, this is not true of all the systems that have been implemented to date.

205. See *id.*

206. See Ainsworth & Todorov, *supra* note 195.

207. See Gerri Chanel, *The Tax that Conquered the World*, TAX INSIGHTS FOR BUS. LEADERS, no. 20, 2018, at 19, 20; Richard Ainsworth, et al., *A VATCoin Solution to MTIC Fraud: Past Efforts, Present Technology, and the EU's 2017 Proposal* (Bos. Univ. Sch. of Law, Working Paper No. 18-08, 2017), https://scholarship.law.bu.edu/cgi/viewcontent.cgi?article=1282&context=faculty_scholarship; *VAT Compliance*, *supra* note 6.

208. For a more detailed explanation of how DICE works, see Ainsworth & Todorov, *supra* note 195.

209. *Id.* at 638–39.

the seller can issue the final invoice to the buyer.²¹⁰ This mechanism is an effective way to share data among centralized databases, enables tax authorities to engage in real-time VAT enforcement, and is likely to be increasingly implemented by countries worldwide.²¹¹ For instance, in 2013, Rwanda successfully adopted a DICE system by requiring VAT-registered businesses to use a certified electronic billing machine at the point of sale. The electronic billing machine generates invoices that indicate the appropriate VAT and stores the transactional data, together with a digital signature verifying data integrity and authenticity, in an encrypted manner.²¹² The secure data is then transmitted on a regular basis into the Rwanda Revenue Authority database, which allows the tax authority to securely and remotely oversee commercial transactions in close to real time and perform more effective audits.²¹³ As a result, the Rwanda Revenue Authority is one of the few tax administrations in the world to “be able to stop VAT frauds as they happen, or at least as soon as the [tax authority] becomes aware of them.”²¹⁴

Another compelling mechanism for achieving this type of real-time reporting and exchange of information regime involves the use of blockchain technology to store and manage VAT transactions.²¹⁵ As further discussed below, instead of using public access keys to verify and share tax data, a more effective and secure method for sharing tax data

210. *Id.* at 639.

211. *See id.* at 638; *The Mandate Is Growing*, *supra* note 202.

212. *See* Ministerial Order no 002/13/10/TC of 31/07/2013 on Modalities of Use of a Certified Electronic Billing Machine (Rwanda), <http://rra.venjix.com/laws-rulings.html>; Rwanda Rev. Auth., *Electronic Billing Machine*, <https://www.rra.gov.rw/index.php?id=33>; Richard T. Ainsworth & Goran Todorov, *Rwanda—Cutting-Edge VAT Compliance* (Bos. Univ. Sch. of Law Working Paper No. 13-46, 2013), <https://ssrn.com/abstract=2327521>.

213. *See* Ainsworth & Todorov, *supra* note 212, at 2–3.

214. *See id.* at 3. Currently, Fiji is also undergoing promising VAT reform. As of 2018, certain businesses are required to use an electronic fiscal device system that produces fiscal invoices that are automatically and instantly verified by the tax administration at the point of sale and are immediately transmitted to the Fiji Revenue and Customs Service system. *See* Tax Administration (Electronic Fiscal Device) Regulations 2017, Gov’t Fiji Gazette Supp. No. 19 (June 1, 2017); *Fiji VAT Monitoring System Project Goes Live January 1st*, SDC (Oct. 27, 2017), <http://www.salesdatacontroller.com/fiji-vat-monitoring-system-project-goes-live-january-1st/>.

215. *See infra* Part III.B.

on a real-time basis would be to use a VAT blockchain consensus process to validate and authorize the digital invoice and simultaneously store the standard, verified invoice-level data on decentralized databases, which is immediately accessible by all authorized parties.²¹⁶

4. Technologies and Real-Time Automatic Information Exchange to Tackle VAT Fraud and Evasion

Effectively counteracting VAT-related fraud and avoidance is a difficult task, but prevention can play a large role.²¹⁷ As illustrated above, the OECD and EU have implemented numerous measures to strengthen their VAT rules and to improve data collection, data exchange, and cooperation between jurisdictions. With the cloud environment further facilitating the remote delivery of intangible supplies, the value of these types of tools has become even more significant. Each of these measures provides the tax authorities important tools to help deter and detect VAT abuse and represents a real step forward in addressing the VAT challenges presented by the cloud. Over the past few years, we have seen improvement in these areas in various countries worldwide.

However, to more effectively target VAT-related fraud and avoidance, it is critical that more data is collected, the data is automatically shared on a real-time basis, and a centralized database or authority exists to improve cooperation across jurisdictions. Having access to large volumes of reliable data on a timely basis can help tax authorities cross-check transactions, identify potential high risk situations, and target fraudulent and abusive transactions.²¹⁸ Both the OECD and EU recognize the importance of these types of measures, and some countries have already implemented electronic invoicing systems. These types of systems should be further expanded. Furthermore, to encourage compliance and minimize the risk of fraud, steps also need to be taken to

216. See Richard T. Ainsworth & Andrew Shact, *Blockchain (Distributed Ledger Technology) Solves VAT Fraud* (Bos. Univ. Sch. of Law & Econ., Working Paper No. 16-41, 2016), <http://www.bu.edu/law/working-papers/blockchain-distributed-ledger-technology-solves-vat-fraud/>.

217. See Traversa & Ceci, *supra* note 44, at 73 (noting that “[t]he best way to limit VAT fraud is preventing it, by the adoption of rules that are not easily circumvented”).

218. See *VAT Fraud: A Global Challenge*, *supra* note 75.

minimize the suppliers' compliance burden. Recent advancements in technology make these goals more feasible.²¹⁹

Moreover, steps need to be taken to develop better multi-jurisdictional cooperation regarding exchange of information, VAT assessments, VAT collection, and VAT enforcement. For example, it would be beneficial to develop a common standard for exchange of information that is simple, minimizes costs for tax administrations and businesses, and can be implemented in a short time frame.²²⁰ The OECD's SAF-T provides an international standard for electronic exchange of tax data, along with standard tests to be performed during a tax audit, and could be a starting point for developing a comprehensive standard.²²¹

In the long run, the implementation of the VAT Administration Unions that we propose above, combined with the use of technologies that facilitate the real-time exchange of information could also significantly help in this regard. In particular, we suggest that jurisdictions participating in the VAU could use blockchain technology to efficiently share information collected through digital invoicing that concerns cross-border transactions and non-resident taxpayer information among participating tax authorities through a secure, decentralized database.²²² This type of online technology platform, which is further explained below in the context of the Gulf Cooperation Council Member States, would significantly improve the exchange of information among tax authorities, reduce fraud, and enhance VAT collection.²²³ With digital transactions seriously challenging the current regimes of collection, an effective, ongoing exchange of information across jurisdictions and cooperation in VAT collection is essential.

219. Both the OECD and EU have also recognized the importance of technology in fighting VAT-related fraud and abuse, but the current use of those tools is insufficient to address the VAT risks posed by the evolving markets. See OECD, *Technology Tools*, *supra* note 73, at 6; *20 Measures to Tackle the VAT GAP*, EUR. COMM'N TAX'N & CUSTOMS UNION, https://ec.europa.eu/taxation_customs/sites/taxation/files/docs/body/2016-03_20_measures_en.pdf (last visited May 31, 2019).

220. See Traversa & Ceci, *supra* note 44, at 85.

221. See *VAT Fraud: A Global Challenge*, *supra* note 75.

222. Alternatively, participating tax authorities could implement a secure extranet among themselves to share information on an ongoing basis. Arthur Cockfield, *Transforming the Internet into a Taxable Forum: A Case Study in E-Commerce Taxation*, 85 MINN. L. REV. 1171, 1237-38 (2001).

223. See *infra* Part III.B.

B. Implementing a Real-Time Blockchain VAT System

Our second set of reform proposals is also technology-based but introduces a more fundamental change to the current VAT system. Here, we recommend that VAT systems implement and use blockchain technology to collect VAT on a real-time basis. However, as noted above, this type of system is not possible unless governments first mandate the use of comprehensive digital invoices by all relevant parties to the transaction.

Blockchain is a public or private electronic ledger of transactions between multiple parties, held on a chain of internet-linked computers.²²⁴ Each computer holds an identical copy of the ledger or database, which changes instantly and simultaneously with each new transaction.²²⁵ This means that everyone in the network has a real-time record of all transactions that have ever taken place and can easily spot and trace if a bad actor is making a fraudulent change. By creating a robust and secure distributive ledger, blockchain technology also provides all participants with immediate access to high quality and secure data²²⁶ Thus, blockchain technology can help with VAT compliance

224. See UK GOV'T CHIEF SCI. ADVISOR, DISTRIBUTED LEDGER TECHNOLOGY: BEYOND BLOCK CHAIN 17 (2016); Lawrence J. Trautum & Mason J. Molesky, *A Primer for Blockchain*, 88 UMKC L. REV. (forthcoming 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3324660.

225. See IMRAN BASHIR, MASTERING BLOCKCHAIN: DISTRIBUTED LEDGER TECHNOLOGY, DECENTRALIZATION, AND SMART CONTRACTS EXPLAINED (2d ed. 2018); MICHAEL J. CASEY & PAUL VIGNA, THE TRUTH MACHINE: THE BLOCKCHAIN AND THE FUTURE OF EVERYTHING (2018); DANIEL DRESCHER, BLOCKCHAIN BASICS: A NON-TECHNICAL INTRODUCTION IN 25 STEPS (2017); ADAM GREENFIELD, RADICAL TECHNOLOGIES: THE DESIGN OF EVERYDAY LIFE (2017).

226. See UK GOV'T CHIEF SCI. ADVISOR, *supra* note 224. These distributive ledgers are transparent, strong, secure, and trustless. See Jeffrey Owens & Julia De Jong, *Taxation on the Blockchain: Opportunities and Challenges*, 87 TAX NOTES INT'L 601, 603 (Aug. 7, 2017). They do not require a third-party intermediary to validate the transactions. See Ainsworth & Shact, *supra* note 216. Instead, a consensus mechanism is used, which means that each new transaction has to be validated before that transaction is cryptographically bound to the previous transactions that have occurred before it. *Id.*; Richard Ainsworth et al., *VATCoin: Can a Crypto Tax Currency Prevent VAT Fraud?*, 84 TAX NOTES INT'L 703 (Nov. 14, 2016). For a detailed discussion of the different consensus mechanisms, see UK GOV'T CHIEF SCI. ADVISOR, *supra* note 224.

and administration by reducing the potential for tax controversy over historical transactional data, reducing VAT fraud and increasing VAT revenues, decreasing the time between remitting the VAT payment and reporting the VAT transaction, speeding up the process for VAT refunds, eliminating the need for time-consuming periodic VAT tax reporting, and overall making the VAT process more efficient.²²⁷

The Gulf Cooperation Council Member States (GCC), which recently introduced VAT for the first time, is likely to become the first VAT system to utilize blockchain technology to transmit information to multijurisdictional tax authorities on a real-time basis.²²⁸ The Unified VAT Agreement for The Cooperation Council for the Arab States of the Gulf (the GCC VAT Agreement), beginning in January 2018, establishes a multijurisdictional single market regime, in which each Member State imposes the VAT in its domestic tax law according to the framework of the GCC VAT Agreement, within one single market.²²⁹ This VAT system is similar to the EU conceptualization of VAT in many regards but also introduces a mechanism for real-time and electronic reporting of transaction-level tax data and a real-time exchange of this data among GCC tax authorities that does not yet exist in the EU VAT system.²³⁰

In particular, Article 71 of the GCC VAT Agreement, requires each GCC member state to create an electronic services system that ultimately is responsible to digitally collect transaction-level invoice data from both buyers and sellers at the time of the transaction and immediately transmit that information to a central electronic tax information center that compiles, confirms, and exchanges the transaction-level data

227. See Trautum & Molesky, *supra* note 224, at 19–20; Channing Flynn, *Preparing for Digital Taxation in a Blockchain World*, TAX PLANNING INT’L REV. (BNA), Oct. 31, 2016; Olivier Rikken, *Blockchain Real Time Tax*, LINKEDIN PULSE (Aug. 22, 2017), <https://www.linkedin.com/pulse/blockchain-real-time-tax-olivier-rikken>.

228. See *The Unified VAT Agreement for the Cooperation Council for the Arab States of the Gulf*, DELOITTE (Jan. 1, 2018), https://www2.deloitte.com/content/dam/Deloitte/xen/Documents/tax/me_Deloitte-english-GCC-VAT-Treaty-translation-May-7.pdf. Although the GCC VAT Agreement appears to contemplate the use of blockchain technology, the specific elements depend on GCC member state laws, none of which has yet been released. See Ainsworth & Alwohaibi, *supra* note 75, at 704.

229. See *Unified VAT Agreement*, *supra* note 228.

230. See Ainsworth & Alwohaibi, *supra* note 75, at 695; *Unified VAT Agreement*, *supra* note 228.

collected from the separate GCC member states' databases.²³¹ The GCC VAT Agreement also goes further and requires the buyer's and seller's documentation to digitally match before it issues a confirmation number to the parties to the transaction.²³² This is an improvement over the EU system in that the GCC requires real-time electronic invoicing, provides secure and accurately matched transaction-level data, and allows member states immediate, on demand access to this intra-community transaction-level data.²³³

By acquiring access to this immense, high quality, and secure data, the tax administrations in the GCC will be able to enhance their use of artificial intelligence scanning to audit compliance and fraud on a real-time basis. As Richard Ainsworth and Musaad Alwohaibi point out:

What makes Article 71 so remarkable is that with it, the GCC has designed multiple *shared centralized ledgers*. Both the taxpayers and the government have access to these ledgers, and the records within them are reasonably permanent, if the buyer's purchase order is required to match the seller's invoice, and a contemporaneous digital signature has been made of this match.²³⁴

If the GCC goes further and implements blockchain technology to replace, consolidate, and authenticate the data in this shared ledger system, as is likely contemplated by the GCC, the benefits of this system will likely further increase.²³⁵ Thus, the GCC VAT system provides a useful illustration of how blockchain technology can be used in the VAT context. As the implementation of the system is very new, the possibilities for analyzing the outcomes are limited, but there is no doubt that this is a system that should be watched and examined closely to cope with VAT and the digital economy.

Moreover, to further extend the benefits of a blockchain VAT system, another proposal that we believe is worthy of further study is

231. See Ainsworth & Alwohaibi, *supra* note 75, at 703; *Unified VAT Agreement*, *supra* note 228.

232. See Ainsworth & Alwohaibi, *supra* note 75, at 704; *Unified VAT Agreement*, *supra* note 228.

233. See Ainsworth & Alwohaibi, *supra* note 75, at 704, 707.

234. See *id.* at 708.

235. See *id.* at 707, 712–13.

Richard Ainsworth, Musaad Alwohaibi, and Mike Cheetham’s proposal that the GCC, EU, and other governments should introduce and use a limited-purpose crypto tax currency, or a “VATCoin,” for tax compliance purposes.²³⁶ According to this proposal, the VATCoin would be a government-issued, non-redeemable digital currency that would be used as the exclusive payment of VAT.²³⁷ Through the use of special software and artificial intelligence, the tax authorities would be able to match VATCoins with transactions on a real-time basis and add the verified transactions to the blockchain, and the VATCoin payments and refunds would be made and received automatically by smart contracts embedded in the invoice documentation.²³⁸ This type of system has the added benefit of being fiscally efficient; it would eliminate any fees that would otherwise be charged by banks or other financial intermediaries.²³⁹ It is also likely both to significantly reduce fraud as no trader holds VAT payments in real currency and to minimize a supplier’s compliance burdens as it shifts the burdens of record-keeping to the government and improves their cash flows.²⁴⁰

In summary, we believe that blockchain and other novel uses of technology are critical to adequately tax this new digital environment. However, despite the benefits these various technological solutions offer, we also recognize that technology has its limitations and does not resolve all the issues created by the digital economy. As one commentator accurately observed, “there will never be an era of perfect compliance and elimination of fraud.”²⁴¹ Another significant issue that technology does not address is how to encourage international cooperation and the exchange of information among jurisdictions that are not part of a

236. See Ainsworth et al., *supra* note 226. A version of this proposal is currently being studied by the EU. Richard T. Ainsworth & Brenda Magauran, *Taxing & Zapping Marijuana: Blockchain Compliance in the Trump Administration*, 88 ST. TAX NOTES 241, 246 (Apr. 16, 2018).

237. See Ainsworth et al., *supra* note 226.

238. *Id.*

239. See *id.*

240. See *id.* at 714–15. For a more detailed discussion of his proposal and some examples of how it might work in practice, see *id.*

241. Bill Millar, *Missing Money*, EY TAX INSIGHTS 31, [https://www.ey.com/Publication/vwLUAssets/ey-tax-insights-no-20-indirect-taxes-are-evolving-are-you/\\$FILE/ey-tax-insights-no-20-indirect-taxes-are-evolving-are-you.pdf](https://www.ey.com/Publication/vwLUAssets/ey-tax-insights-no-20-indirect-taxes-are-evolving-are-you/$FILE/ey-tax-insights-no-20-indirect-taxes-are-evolving-are-you.pdf).

multi-state community, such as the EU and the GCC.²⁴² Given the global and cross-border nature of cloud computing and other digital transactions, the resolution of this issue is critical. Transforming transaction-level data into digital form is an important first step in achieving this result, but now we need a consensus among countries to share that information, such as what the BEPS project achieved with country-by-country reporting for transfer pricing purposes.²⁴³

In addition, these technological solutions give rise to certain concerns. For instance, implementing these various technological solutions will involve a transition period and, initially, significant costs for both governments and businesses.²⁴⁴ Who should bear the cost of implementing the technology? Moreover, the full potential of some of these technologies, such as blockchain, are still being uncovered and will require consideration of potential security, performance, and scalability issues. Moving to a more digital system that captures more information and provides it to a greater number of users also brings up concerns about how to balance the need for transparency and protect the privacy of its users.²⁴⁵

C. Collecting VAT Through Payment Intermediaries

Finally, in this third set of reform proposals, we set forth a revolutionary and comprehensive proposal to collect VAT on digital transactions from payment intermediaries, instead of suppliers.²⁴⁶ Due to changes

242. See Jinyan Li, *Consumption Taxation of Electronic Commerce: Problems, Policy Implications and Proposals for Reform*, 38 CAN. BUS. L.J. 425, 456 (2003); Walpole, *supra* note 151, at 263; Lachlan Wolfers, *The Future of Indirect Taxes—2020 and Beyond!*, 13 TAX PLAN. INT'L 2, 5 (Oct. 30, 2015).

243. See OECD, *Country-by-Country Reporting*, <http://www.oecd.org/tax/automatic-exchange/about-automatic-exchange/country-by-country-reporting.htm> (last visited May 31, 2019).

244. See Owens & De Jong, *supra* note 226.

245. See *id.*

246. Although the role of payment intermediaries in collecting VAT has been previously raised and discussed in the literature, this is the first time that a comprehensive analysis and proposal is made. In 2009, a High Level Group of Independent Stakeholders on Administrative Burdens raised the idea to change the timing of the VAT payment and refund to the point at which payment is settled. See High Level Grp. of Indep. Stakeholders on Admin. Burdens, Eur. Comm'n, *Opinion of the High Level Group: Subject: Priority Area Taxation (VAT)* (2009), http://ec.europa.eu/smart-regulation/refit/admin_burden

in technology, the globalization of the economy and the evolution of business models, suppliers often face significant practical constraints, compliance costs, and substantial difficulties in assessing and remitting the appropriate VAT obligation, and tax administrations face challenges enforcing and collecting the tax. Therefore, to tax cloud computing transactions and other remote, digital transactions more effectively in this digital age, it is necessary to shift the burden of imposing VAT assessment obligations away from the supplier. As further explained below, we argue that tax authorities should impose these VAT collection burdens on banks, credit card companies, and other payment facilities (collectively, the “payment intermediaries”), instead of suppliers.

In our view, these types of entities represent an effective and efficient intermediary to collect VAT on cross-border transactions in general, in e-commerce transactions specifically, and in cloud computing transactions in particular. These entities are central payment intermediaries that play a critical role in almost every digital transaction. Moreover, these payment intermediaries already collect, store, and update information related to their customers for regulatory reasons and generally possess information related to the financial terms of the transaction for payment processing purposes.²⁴⁷ Thus, these entities already have the information necessary to appropriately assess a customer’s VAT obligations and would most likely not need to collect any further data for VAT collection purposes. Even in cases where further data concerning the goods may be necessary, these entities could receive it automatically and electronically from the vendor involved in the

/docs/enterprise/files/hlg_opinion_taxation_09052009_en.pdf. This group introduced a real-time VAT collection system based on an electronic system where all VAT payments are settled in real time through the banking system. *See id.* However, the idea was not developed further, did not progress in the EU paths of legislation, and the idea’s supporters did not really act to enhance their real-time VAT idea. *See VAT Fraud—Technological Solutions, supra* note 75.

Charlène Adline Herbain and Marie Lamensch have also supported the involvement of payment intermediaries in the process of collecting VAT. *See Herbain & Lamensch, supra* note 28; *see also* CHARLÈNE ADLINE HERBAIN, VAT NEUTRALITY (2015); MARIE LAMENSCH, EUROPEAN VALUE ADDED TAX IN THE DIGITAL ERA: A CRITICAL ANALYSIS AND PROPOSALS FOR REFORM (2015). However, their proposal differs substantially from our proposal, because they suggest removing the fractioned collection feature of the VAT, which we do not seek to do in our proposal. *See Herbain & Lamensch, supra* note 28.

247. *See Lamensch, supra* note 53.

transaction. Given these features and the rapid development and expansion of cloud computing and the digital economy, we recommend that these intermediaries should collect the VAT on cloud computing and other digital transactions at the time that the intermediary processes the payment between the supplier and the customer and immediately remit the VAT to the country of supply.

We propose that the collection of the VAT through the payment intermediaries could work as follows: First, when a transaction takes place between a supplier and customer, the supplier of the goods or services would issue an invoice that details the product and its price. The invoice would also indicate that the VAT will be charged and collected through the payment intermediary and will be provided to both the customer and payment intermediary. Second, the supplier sends the invoice, notice, and payment authorization request to the payment intermediary. Third, once the payment intermediary receives this documentation, it would determine the place of supply according to the residency of the customer based on the data stored with the payment intermediary. Fourth, the intermediary would add the VAT to the price noted on the invoice according to the rate of the place of supply and would collect the VAT together with the price on a real-time basis at the time of payment. The intermediary would then issue two confirmations: (i) one confirmation for the payment of the price and (ii) one confirmation for the payment of the VAT. It would attach these confirmation certificates to the invoice issued by the supplier and instantaneously deliver them electronically to both the customer and supplier. Fifth, the payment intermediary would then transfer the VAT to the relevant VAT administration and transfer the invoice price to the relevant supplier. Finally, if the consumer is a business, the consumer could then use the invoice it received from the supplier together with the VAT payment confirmation certificate it received from the payment intermediary to deduct the input tax and maintain the fundamental principle of VAT as a tax on consumption.

The use of payment intermediaries for tax compliance purposes is not unprecedented. In recent years, the role of financial institutions in enhancing tax compliance is rising.²⁴⁸ For example, the Foreign

248. See RONEN PALAN ET AL., *TAX HAVENS: HOW GLOBALIZATION REALLY WORKS* 203–25 (2010); Mark Hampton & John Christensen, *Offshore Pariahs? Small Island Economies, Tax Havens, and the Re-Configuration of Global Finance*, 30 *WORLD DEV.* 1657 (2002); Niels Johannsen & Gabriel

Account Tax Compliance Act (FATCA) in the United States, imposes obligations and costs on financial institutions worldwide to enhance compliance with U.S. international tax rules.²⁴⁹ Similarly, section 6050W of the Internal Revenue Code requires banks, third-party settlement organizations, and others to send annual reports to the IRS that contain information on payments made to merchants via debit/credit cards or certain electronic means to enable comparison between this data and the reported data on their tax returns.²⁵⁰ These and other measures are using financial institutions to enhance tax compliance, reduce tax fraud and evasion, and close the tax gap. The same idea holds for VAT purposes, and it is expected to be even more effective.²⁵¹

Moreover, the economic literature and data suggests that by imposing both reporting and withholding obligations on payment intermediaries, our proposal is likely to increase VAT compliance. In particular, third-party reporting increases the probability of detection, which

Zucman, *The End of Bank Secrecy? An Evaluation of the G20 Tax Haven Crackdown*, AM. ECON. J.: ECON. POL'Y, Feb. 2014, at 65.

249. See *Foreign Account Tax Compliance*, IRS, <https://www.irs.gov/businesses/corporations/foreign-account-tax-compliance-act-fatca> (last updated Feb. 28, 2019); J. Richard (Dick) Harvey, Jr., *Offshore Accounts: Insider's Summary of FATCA and Its Potential Future*, 57 VILL. L. REV. 471 (2012); Itai Grinberg, *Beyond FATCA: An Evolutionary Moment for the International Tax System* (Jan. 27, 2012), <https://ssrn.com/abstract=1996752>.

250. See Leandra Lederman, *Reducing Information Gaps to Reduce the Tax Gap: When Is Information Reporting Warranted?*, 78 FORDHAM L. REV. 1733 (2010); see also T.D. 9496, 2010–43 I.R.B. 484. Another prominent example of a reporting obligation is the requirement that obligated reporting entities, at the end of each calendar year, file an information return with the IRS that reports the gross amount of that merchant's transactions for the year and provides a corresponding Form 1099-K to the merchant. See Jeffrey H. Kahn & Gregg D. Polsky, *The End of Cash, the Income Tax, and the Next 100 years*, 41 FLA. ST. U. L. REV. 159 (2013).

251. For instance, on January 1, 2017, Colombia introduced new legislation that imposes a withholding requirement on credit card companies and other payment processors to collect VAT on nonresident suppliers of B2C digital services. See *Indirect Tax Challenges of the Digital Economy in Latin America*, DELOITTE (2017), <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/gx-indirect-tax-challenges-digital%20economy-latin-america.pdf>.

increases the deterrence effect and reduces tax evasion.²⁵² For instance, recent studies have indicated that information reporting according to section 6050W made these taxpayers more likely to file a return declaring business income and increased filers' reported receipts by up to 24%.²⁵³ On the other hand, the fact that credit card transactions are traceable has not been sufficient in itself to increase compliance.²⁵⁴ These examples highlight our need for more proactive policy. The explicit use of payment intermediaries as tax control instruments either through reporting or withholding is one method that is likely to be effective in this regard.

We recognize that our proposal raises additional costs. In particular, collecting VAT through payment intermediaries imposes a burden on these entities, and they would have to invest resources to adapt their information technology systems in accordance with our proposal. However, given the substantial burdens currently imposed on suppliers and the likelihood of significantly reducing the VAT gap, we believe this burden is outweighed by the potential benefits. Moreover, to further minimize the costs on payment intermediaries, governments could compensate these one-time adaption costs either partially or fully.

In addition, our proposal establishes a second system of collection for digital transactions, which arguably may be said to complicate the VAT collection system. Specifically, this additional system requires suppliers to determine which collection system to apply to each transaction. However, the distinction can be drawn with minimum resources. Moreover, this additional system simplifies the process and enables the

252. See Joel B. Slemrod, *Tax Compliance and Enforcement: An Overview of New Research and Its Policy Implications* (Ross Sch. Bus. Paper No. 1302, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2726077.

253. See *id.* at 17. However, taxpayers largely offset increased reported receipts with increased reported expenses, which do not face information reporting, thereby diminishing the impact on reported net taxable income. See Joel Slemrod et al., *Does Credit-Card Information Reporting Improve Small-Business Tax Compliance?* (Nat'l Bureau of Econ. Research, Working Paper No. 21412, 2015), <http://www.nber.org/papers/w21412>.

254. See Boryana Madzharova, *The Impact of Cash and Card Transactions on VAT Collection Efficiency*, DEUTSCHE BUNDESBANK (2014), <https://www.bundesbank.de/resource/blob/635122/3526e928c2e1b871dcb88b5d10ce3d24/mL/2014-09-16-the-impact-of-cash-and-card-transactions-on-vat-collection-efficiency-data.pdf>.

collection and the remittance of VAT on a real-time basis. Therefore, the benefits outweigh the limited costs of any added complexity.

Recently, the European Commission examined a range of options for applying a split payment mechanism, which separates payments for supplies between the VAT amount and the taxable base, as an alternative VAT collection method.²⁵⁵ The analysis recognizes split payment as an effective measure to combat VAT fraud and non-compliance, especially the missing trader fraud, because payment is split upon performance of the transaction, and the VAT is paid in advance either to a dedicated VAT bank account of the supplier or to the VAT administration. According to the European Commission's analysis, "the main advantages of split payment in the current VAT regime would be the reduction of VAT fraud and avoidance, which would increase by expansion of the scope of split payment. Results of the cost-benefit analysis show that all options are expected to reduce the VAT Gap to some extent ranging from 27% to 56% reduction under the current regime."²⁵⁶ However, the European Commission's analysis also found that a split payment mechanism would increase administrative costs to businesses and public bodies and would have a negative cash flow impact on businesses, impacting their working capital. Thus, the study concludes that "the overall evaluation shows that benefits of introducing a split payment mechanism under the current VAT regime would be highly uncertain."²⁵⁷

Despite the concerns raised in the European Commission's report, we believe that collecting VAT through payment intermediaries on a real-time basis is a step in the right direction to improving the current VAT system.²⁵⁸ It is important to read the recent European

255. See Deloitte, *Analysis of the Impact of the Split Payment Mechanism as an Alternative VAT Collection Method: Final Report*, EUR. COMM'N (Dec. 2017), https://ec.europa.eu/taxation_customs/sites/taxation/files/split_payment_report_execsummary_2017_en.pdf.

256. *Id.* at 5–6.

257. *Id.* at 7.

258. Italy has employed a split payment mechanism for payment to public authorities and has expanded it; Poland introduced a split payment mechanism on a voluntary basis and is considering a mandatory system. See Deloitte, *supra* note 255; Ulrika Lomas, *Italy Lists Companies Covered by VAT Split Payment Regime*, WOLTERS KLUWER GLOBAL TAX NEWS (Jan. 21, 2019), https://www.tax-news.com/news/Italy_Lists_Companies_Covered_By_VAT_Split_Payment_Regime___97002.html; Ulrika Lomas, *Poland Launches Consultation on VAT Split Payment Mechanism*, WOLTERS KLUWER GLOBAL

Commission's analysis accurately and carefully. Both administrative and cash flow costs are dependent on the details of the split mechanism, and the details of our proposal differ from that set forth in the European Commission's report. More importantly, our proposals emphasize and increase the role of technology in collecting VAT and ensuring compliance. These technologies are expected to reduce administrative costs substantially. Although the cash flow costs are a real concern, especially for small and medium enterprises, several measures could be taken to reduce the negative cash flow impact on small and medium enterprises. For instance, a financial line of credit, guaranteed by the government, in the average amounts of collected VAT, for businesses that do not exceed a maximum threshold in their turnover, is one option that could help address these administrative concerns. Thus, the use of payment intermediaries for VAT collection purposes remains worthy of consideration.

We recognize that the type of system that we propose is not perfect and will not solve all of the challenges that arise when trying to impose VAT on cloud computing and other online transactions. However, the collection of VAT through payment intermediaries would improve the current system and substantially contribute to the development of an effective and efficient VAT collection system in this digital era. The system is effective because payment intermediaries are already a critical part of most transactions, have the required data about the consumer and his or her residency to determine the place of supply and impose the appropriate VAT, and control the money. In addition, the system is more efficient because payment intermediaries have direct access to the funds and data and, therefore, the costs of collecting VAT

TAX NEWS (June 5, 2019), https://www.tax-news.com/news/Poland_Launches_Consultation_On_VAT_Split_Payment_Mechanism___97133.html. The UK has held a public consultation on split payment, and it seems that the UK has the ambitions of developing a real-time split payment collection mechanism that relies on technology heavily through cooperation with the financial industry and the technology industry. See *Alternative Method of VAT Collection—Split Payment Consultation Document*, HM REV. & CUSTOMS (Mar. 13, 2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/687783/Alternative_method_of_VAT_collection___split_payment.pdf; *Alternative Method of VAT Collection Summary of Responses*, HM REV. & CUSTOMS (Nov. 7, 2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/754209/Alternative_method_of_VAT_collection_summary_of_responses.pdf.

through payment intermediaries is expected to be lower for both suppliers and tax administrations than the current system. Finally, this system is likely to reduce the VAT gap, because payment intermediaries have less incentive for fraud, have access to more reliable information in calculating the VAT, and the VAT funds go directly to the tax authorities rather than through the supplier's bank account.²⁵⁹ In sum, our proposal is the beginning of an evolutionary process that will lead in the long run to the replacement of the current burden of collecting VAT from businesses to payment intermediaries, while also improving overall VAT enforcement.

CONCLUSION

Current tax systems are being forced to change to adapt to our global, digital economy. E-commerce and cloud computing have both led to important international and national conversations on consumption taxes such as VATs, which have resulted in new policies, principles, and laws to cope with the challenges. But progress thus far is insufficient; more substantial reform is critical to ensure that governments can collect taxes on cloud computing transactions effectively and efficiently. We suggest using technologies and intermediaries to substantially improve tax collection on these transactions through the existing registration-based VAT system. We further argue that a more fundamental change that involves the use of blockchain technology to collect VAT in real time would likely result in more substantial improvements and bring us closer to having a fully digitalized VAT system that is more compatible with the digital economy. We also develop a novel and comprehensive proposal to collect VAT through payment intermediaries on a real-time basis. We argue that these fundamental changes are the key for the long-term success of consumption taxation in our digital world.

259. See Herbain & Lamensch, *supra* note 28.