The OECD/G20 Pillar 1 and Digital Services Taxes: A Comparison

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SUMMARY

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Jane G. Gravelle
Senior Specialist in Economic Policy

The OECD/G20 Pillar 1 and Digital Services Taxes: A Comparison

If Congress chooses not to adopt Pillar 1 of the OECD/G20 proposal to allocate some taxing rights to market countries, digital services taxes (DSTs) will likely continue and proliferate. DSTs are taxes imposed by other countries on the revenue of large firms, and they are alleged to target U.S. multinationals that provide digital products. Adopting Pillar 1 would likely shift the right to tax some profits of these multinationals to market countries, increase U.S. firms' taxes, and lose U.S. revenue, but would reduce the number of DSTs. These two options (i.e., adopting or not adopting Pillar 1) have different economic consequences, which are relevant to this choice. In addition, not adopting Pillar 1 may trigger the imposition of retaliatory tariffs on imports from certain countries imposing DSTs that are currently on hold.

Pillar 1 would allocate 25% of the profits of large multinationals—defined as those with global revenues of $20 billion or more and profit margins (profits as a percentage of revenue) over 10%—to market countries, referred to as Amount A. Under long-standing international rules as embodied in tax treaties, these profits are currently allocated to the country where the assets are held. Pillar 1 was originally aimed at digital companies that did not have a physical presence in some countries and was based on the argument that users create value. While this allocation rule was being considered by the Organisation for Economic Co-operation and Development (OECD), a number of countries enacted DSTs. These taxes vary, but can be imposed on advertising revenues of digital companies, sales in online markets, sales of data, and sales of digital products. Part of the Pillar 1 agreement is the removal of DSTs in certain countries. Other countries that retain or enact DSTs will be disallowed their share of Amount A.

Pillar 1 has since evolved to cover all industries (not just digital firms) with the exception of the financial and extractive industries. Therefore, it is no longer targeted only at digital firms with no physical presence, as first envisioned by the OECD, but is a general move to partial formulary apportionment based on sales, similar to sales taxes imposed by U.S. states. Unlike state formulary apportionment, however, Pillar 1 remains limited to large profitable firms.

Digital services taxes have proliferated. The United States Trade Representative (USTR) conducted studies of DSTs in France, and then subsequently in Austria, India, Italy, Spain, Turkey, and the United Kingdom, and determined that they discriminate against U.S. firms. Retaliatory tariffs were imposed for these countries, but suspended while Pillar 1 was being considered. Canada is now moving forward with a DST, and the USTR has determined its effects are similar to those of the other countries investigated.

Evidence suggests that both Pillar 1and DSTs fall disproportionately on U.S. firms, which are responsible for between half and two-thirds of Amount A, while accounting for 37% of the profits of the 500 largest global companies. Although CRS was not able to locate a comprehensive study of the U.S. share of DSTs, the USTR analysis identified the focus on U.S. firms. For example, the USTR found that 75% of the French DST on advertising would be paid by two U.S. firms, Alphabet (formerly Google) and Meta (formerly Facebook). In the UK, 90% of the tax was paid by five firms who are likely largely or completely U.S. firms.

There were two justifications for Pillar 1 and for the DSTs that developed. The first was that these companies did not pay their fair share of international taxes. It can be argued, however, that Pillar 2, which applies a global minimum tax of 15%, addresses that issue, and that the issue has also been addressed by the U.S. minimum tax on global intangible low-taxed income, or GILTI. The second reason is the argument that users of digital products create value, which justifies assigning a share of profits to market countries. This argument could be said to become moot after Pillar 1 was expanded to all firms, but it could also be argued that user value creation was never a valid argument in the first place, as users exchanged their contributions for benefits, such as free search engines.

The economic effects of the two options also differ. Pillar 1 will increase taxes on U.S. firms, which will in part be offset by foreign tax credits, so there is an estimated revenue loss. DSTs will be passed along to consumers and thereby largely fall on the residents of the countries imposing the taxes.

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Introduction

Over the past several years, international tax proposals by the Organisation for Economic Co-operation and Development (OECD) and the Group of 20 (G20) have been agreed upon by most countries. These proposals include Pillar 1, a plan to reallocate some taxing rights to countries based on where customers are located, in a departure from long-standing practice. Pillar 1 originally targeted large profitable digital companies, but now applies to most large profitable multinationals. While these proposals were under discussion, many countries enacted digital services taxes (DSTs) as a substitute.

If Congress chooses not to adopt Pillar 1 to allocate some taxing rights to market countries, DSTs will likely continue and proliferate. DSTs are taxes imposed by other countries on the revenue of large firms, and they are alleged to target U.S. multinationals, such as Google (Alphabet), Apple, Facebook (Meta), and Amazon, that provide digital products and services. In addition, not adopting Pillar 1 may trigger the imposition of retaliatory tariffs on certain countries; those tariffs are currently on hold.

Adopting Pillar 1 would likely shift the right to tax some profits of these multinationals to market countries, raise U.S. firms' taxes, and lose U.S. revenue, but would reduce the number of DSTs. These two options (i.e., adopting or not adopting Pillar 1) have different economic consequences, which are relevant to this choice.

The OECD/G20 Base Erosion Project and Pillar 1[1]

The Two-Pillar Approach

In 2021, over 135 countries agreed on a two-pillar plan to implement the 2008 Action 1 proposed by the OECD to address tax challenges in the digital economy.[2] Pillar 1 would allocate 25% of profits for large multinationals—defined as those with global revenues of $20 billion or more and profit margins (profits as a percentage of revenue) over 10%—to be taxed by countries based on where customers are located. This amount is referred to as Amount A.[3] The other pillar, Pillar 2, would impose a global minimum tax.[4] Pillar 1 includes an agreement to repeal DSTs in certain

[1] Pillar 1 was the subject of a hearing by the House Committee on Ways and Means; see U.S. Congress, House Committee on Ways and Means, Tax Subcommittee, *OECD Pillar 1: Ensuring the Biden Administration Puts Americans First*, hearings, 118th Cong., 2nd sess., March 7, 2024, https://waysandmeans.house.gov/event/tax-subcommittee-hearing-on-oecd-pillar-1-ensuring-the-biden-administration-puts-americans-first/. See also Joint Committee on Taxation, *Background And Analysis Of The Taxation Of Multinational Enterprises And The Potential Reallocation Of Taxing Rights Under the OECD's Pillar One*, JCX-7-24, March 5, 2024, https://www.jct.gov/publications/2024/jcx-7-24/. These sources discuss many technical details and concerns about tax certainty, tax administration, and avoiding double taxation.

[2] Organisation for Economic Co-operation and Development (OECD), *International tax reform: Multilateral Convention to Implement Amount A of Pillar One*, https://www.oecd.org/tax/beps/multilateral-convention-to-implement-amount-a-of-pillar-one.htm.

[3] Pillar 1 also contains another proposal, to simplify the method of allocating profits between the seller and distributor of goods, which is not addressed in this report and is referred to as amount B. See Joint Committee on Taxation, *Background And Analysis Of The Taxation Of Multinational Enterprises And The Potential Reallocation Of Taxing Rights Under the OECD's Pillar One*, JCX-7-24, March 5, 2024, https://www.jct.gov/publications/2024/jcx-7-24/ for a discussion of amount B.

[4] For more information on Pillar 2, see CRS Report R47174, *The Pillar 2 Global Minimum Tax: Implications for U.S. Tax Policy*, by Jane G. Gravelle and Mark P. Keightley.

countries, and would disallow the allocation of profits to countries that retain or introduce DSTs.[5] U.S. adoption of these pillars would require Congress's approval. While countries are already adopting Pillar 2 without U.S. agreement, Pillar 1 would likely require U.S. approval to go forward, since a large fraction of the income affected is from U.S. multinationals. The deadline for agreement on Pillar 1 was extended for a year through 2024. Canada was considering a DST and delayed adoption while Pillar 1 was under consideration, but is now continuing with a retroactive DST. If Pillar 1 is adopted, there will likely be a revenue loss to the United States due to the reallocation of taxing rights, an increased tax on U.S. firms, and an associated increased claim of foreign tax credits.

If Pillar 1 is not adopted, DSTs that have been adopted over the past few years would likely remain and proliferate.

The Evolution of Pillar 1 from a Narrow Digital Services Tax to a Broad Application of Formula Apportionment for Large Multinational Companies

In 2008, at the behest of the G20, the OECD began a project on base erosion and profit shifting, in part related to concerns about multinational corporate tax avoidance and evasion. In 2013, the OECD/G20 unveiled its 15-item action plan, with all but Action 1 finalized in 2015.[6] Action 1 addressed taxation of multinational companies in the digital age, but did not propose changes in corporate income tax. The growth of companies that provide digital services (such as search engines, online marketplaces, and sites for social networking) increased the amount of intangible assets, which can facilitate profit shifting because the assets can be easily relocated. The OECD committed to finding a consensus on this issue by 2021. One reason for addressing taxation of digital companies was concern about the location of intangible assets in low-tax countries so that these firms paid relatively little tax. The second was an argument that users of these services created value, justifying the allocation of taxing rights to a portion of income to market countries.

Allocating taxing rights to the profits of digital companies based on where customers are located would violate the standard allocation of profits to the jurisdiction where assets are held. These sourcing rules are in bilateral treaties, so market countries could not tax any of these profits under the income tax. As the OECD continued work on Action 1, a number of countries began to impose digital services taxes (DSTs), which were based on revenue rather than income and would not violate the international sourcing rules. In another development, the United States altered its international tax rules, which previously taxed dividends from foreign subsidiaries, to a tax aimed at intangible income of foreign subsidiaries in tax havens, called the global international low taxed income (GILTI) tax.

Between 2015 and 2021, when Action 1 was formalized into the two-pillar approach, the nature of the proposal changed considerably. Action 1 was originally focused on whether market

[5] Eight countries are specifically listed in the multilateral treaty (Annex A). See OECD, *The Multilateral Convention to Implement Amount A of Pillar One*, https://www.oecd.org/tax/beps/multilateral-convention-to-implement-amount-a-of-pillar-one.pdf.

[6] See CRS Report R44900, *Base Erosion and Profit Shifting (BEPS): OECD/G20 Tax Proposals*, by Jane G. Gravelle. The 2013 OECD proposal is at OECD iLibrary, *Action Plan on Base Erosion and Profit Shifting*, July 19, 2013, https://www.oecd-ilibrary.org/docserver/9789264202719-en.pdf?expires=1706025839&id=id&accname=oid011901&checksum=EEAB884B1CCDE80170F2187B4C881D3B, and the 2015 actions are at "BEPS Actions," OECD/G20, https://www.oecd.org/tax/beps/beps-actions/. Action 1 time line, as well as links to each document relating to Action 1 and the two Pillars, can be found at "Action 1: Tax Challenges Arising from Digitalisation," OECD/G20, https://www.oecd.org/tax/beps/beps-actions/action1/.

countries should have the rights to taxing some of the income from digital firms based on value creation. Pillar 1 would allocate some taxing rights to market countries. Pillar 2 proposed a global minimum tax similar in some ways to GILTI, and is only related to the digital economy in that digital firms find it easier to engage in profit shifting.

The nature of Pillar 1 changed significantly from the ideas in Action 1. The first interim report in 2018 lays out the case for the value creation justification in detail.[7] These ideas were all related to companies providing digital services, as was the original Action 1. Over time the definition of activities covered expanded. First, the concept was extended to consumer-facing businesses, which would cover ordinary direct exports of consumer goods directly to consumers, including online marketplaces.[8] This extension was apparently to address differing views on whether an allocation to market companies should be confined to a narrow group of digital firms as first envisioned in Action 1 or to a broader group of firms.[9] In 2021, the final Pillar 1 proposal abandoned the focus on digital firms entirely and applied to all firms, except financial and extractive businesses.[10] Under this proposal, income from the export of physical goods manufactured in the United States could be taxed by the importing country.

Pillar 1 had moved from the idea of an allocation of profits based on user contributions to value to an outright formula apportionment of profits to market companies, but limited to very large corporations. Moreover, it allowed an exemption for what was thought of as normal profits (thereby isolating excess profits) but used a measure based on revenue rather than profits (profit margin). That meant firms would fall into different categories depending on how much revenue was generated by assets relative to other inputs, especially inventory. Thus, an online marketplace firm such as Amazon would not fall into this category. The agreement, however, also imposed the tax on divisions in certain cases, so that Amazon's marketplace business could be separated from its digital business, with the latter potentially falling under Pillar 1.

One goal of Pillar 1 that was still aligned with digital firms was to eliminate or discourage DSTs. The Pillar 1 model treaty lists some specific DSTs that would be eliminated. In addition, the reallocations of Amount A would be denied to any country with a DST. Canada's recently announced DST was not in place when the model treaty was drafted. There is also an agreement among the United States, Austria, France, Italy, and the UK that any revenues from DSTs in excess of the amount that would be paid under Pillar 2 will be refunded, which was adopted in October 2021 and was to expire at the end of 2023. On February 15, 2024, it was extended through June 2024.[11]

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[7] OECD, *Tax Challenges Arising from Digitalisation—Interim Report 2018*, March 16, 2018, https://www.oecd-ilibrary.org/docserver/9789264293083-en.pdf?expires=1708963762&id=id&accname=ocid195520&checksum=BE09997B9B276AA0FF56188D74F5340F.

[8] OECD, *Secretariat Proposal for a "Unified Approach" under Pillar One, 9 October 2019-12 November 2019*, https://web-archive.oecd.org/2019-10-10/532365-public-consultation-document-secretariat-proposal-unified-approach-pillar-one.pdf; and OECD, *Statement by the OECD/G20 Inclusive Framework on BEPS on the Two-Pillar Approach to Address the Tax Challenges Arising from the Digitalisation of the Economy, As approved by the OECD/G20 Inclusive Framework on BEPSon 29-30 January 2020*, https://www.oecd.org/tax/beps/statement-by-the-oecd-g20-inclusive-framework-on-beps-january-2020.pdf.

[9] OECD/G20 Base Erosion and Profit Shifting Project, *Tax Challenges Arising from Digitalisation—Report on Pillar One Blueprint*, October 2020, https://www.oecd-ilibrary.org/docserver/beba0634-en.pdf?expires=1708102785&id=id&accname=ocid195520&checksum=78B927E2826DCFDE31679D165FE5D639.

[10] OECD/G20 Base Erosion and Profit Shifting Project, *Statement on a Two-Pillar Solution to Address the Tax Challenges Arising From the Digitalisation of the Economy*, July 1, 2021, https://www.oecd.org/tax/beps/statement-on-a-two-pillar-solution-to-address-the-tax-challenges-arising-from-the-digitalisation-of-the-economy-july-2021.pdf.

[11] U.S. Department of the Treasury, "The United States, Austria, France, Italy, Spain, and the United Kingdom (continued...)

Pillar 2 has already been adopted by many countries, although not by the United States, and the scope of Pillar 2 will expand in 2025.[12]

Digital Services Taxes (DSTs)

DSTs largely appeared in Europe (although the first tax on digital advertising was imposed on nonresidents by India) and were apparently justified by the same arguments initially made for Pillar 1: that digital companies were not paying enough income tax and that users provided value. The European countries applied the tax to larger companies, typically those with at least €750 million (approximately $825 million at current exchange rates) in receipts globally.

Application of DSTs

DSTs are taxes that are imposed on *revenue* rather than *profits* (income). This distinction is important for understanding the economic effects of such taxes. In short, the effects of DSTs are the same as sales taxes or excise taxes. Digital services taxes can apply to various types of receipts of digital companies, including advertising revenues, earnings from online marketplaces, sales of data, or social networking services (such as dating apps).

Digital services taxes are similar to sales taxes but are separate and in addition to sales and value-added taxes that apply in most countries. There have always been compliance issues with taxes on direct sales to consumers, either through online marketplaces or mail-order businesses. Remote sellers in the United States are generally required to collect state sales taxes. Similarly, the EU, for example, requires online marketplaces to collect value-added taxes (VATs). In the case of free digital services that are financed by advertising, VATs in the EU are collected on advertising, which is part of the price of final products.

DSTs or taxes based on gross receipts are traditionally not eligible for foreign tax credits, and this rule is confirmed with respect to DSTs in recent IRS Notice 2023-55.[13]

The DSTs, while not an income tax, were a response to issues with imposing income taxes on digital firms.

History of Digital Services Taxes (DSTs)

DSTs began appearing after Action 1 was not finalized in 2015. In 2016, India imposed its equalization levy on online advertising by nonresidents,[14] and numerous countries have since enacted or proposed some type of tax on digital services.[15] The EU proposed a harmonized DST

Announce Extension of Agreement on the Transition from Existing Digital Services Taxes to New Multilateral Solution Agreed by the G20/OECD Inclusive Framework," press release, February 15, 2024, https://home.treasury.gov/news/press-releases/jy2098.

[12] Currently a domestic top-up tax (the qualified domestic minimum top-up tax or QDMTT) and a top-up tax by parents on the income of foreign subsidiaries (the income inclusion rule or IIR) has been adopted. The undertaxed profits rule (UTPR), which would allow any related subsidiary to tax profits of another related firm, is on hold until 2025.

[13] U.S. Internal Revenue Service (IRS), *Temporary Relief Under Sections 901 and 903 of the Internal Revenue Code*, IRS Notice 2023-55, July 21, 2023, https://www.irs.gov/pub/irs-drop/n-23-55.pdf. This notice was to provide temporary relief to some previous regulations but the issues of concern were not DSTs.

[14] India adopted a tax on online advertising by nonresidents in 2016, but expanded the tax to a general tax on e-commerce in 2020. See "India Has Significantly Expanded Its Equalization Levy," RSM, January 23, 2023, https://rsmus.com/insights/services/business-tax/india-has-significantly-expanded-its-equalization-levy.html.

[15] A list as of 2023 is in Joint Committee on Taxation, *Background And Analysis Of The Taxation Of Income Earned*

(continued...)

in 2018, but it was not able to get agreement of all members. Also in 2018, Spain, the UK, and France proposed DSTs. The tax rates were 3% in Spain and France and 2% in the UK. The taxes were viewed in the United States as targeting U.S. firms.

In 2019, the Office of the United States Trade Representative (USTR) began an investigation of the French DST under Section 301 of the Trade Act of 1974. In 2020, it began an investigation of DSTs in Austria, Brazil, the Czech Republic, the European Union, India, Indonesia, Italy, Spain, Turkey, and the United Kingdom.[16] In 2020, the USTR announced tariffs on French goods but provided a delay until January 6, 2021. The tariffs were subsequently suspended. Later in 2021, the USTR announced and suspended tariffs on six countries (Austria, India, Italy, Spain, Turkey, and the United Kingdom).[17] The tariffs were suspended to allow time to work out the response to the digital issue in Action 1. (The other countries and the EU did not impose taxes.)

The USTR's report on the French DST provided insight into the arguments for the DST (made by French officials), which were similar to the arguments for the reallocation of income under Pillar 1: that digital companies paid low effective tax rates and the users created value.[18] The report also discussed the United States' view that the tax was designed largely to target U.S. firms and exclude French firms through the specific services covered and its application to large firms with €750 million globally and €24 million in France. The French DST applied to advertising and e-commerce, excluding transactions that firms made from their own inventories. It was popularly referred to by French politicians as the GAFA tax (Google, Apple, Facebook, and Amazon).

Although there are agreements about some specific taxes in the Pillar 1 treaty, other countries may elect to retain their DSTs and forgo any revenue allocation.

Do Pillar 1 Reallocations and DSTs Target U.S. Firms?

Concerns have been raised that Pillar 1 reallocations and DSTs are aimed primarily at U.S. multinationals. The evidence presented below suggests that U.S. firms are disproportionately affected by both of these regimes.

Country Shares of Amounts Subject To Reallocation (Amount A) in Pillar 1

Pillar 1 effectively targets U.S. companies by limiting the allocation rules to firms with revenues over $20 billion and a profit-to-sales ratio of over 10%, while excluding financial and extractive industries. The United States tends to dominate those types of companies, which often have mostly intangible assets. The OECD most recently estimated that Pillar 1 would reallocate $200

By Multinational Enterprises, JCX-35R-23, July 23, 2023, https://www.jct.gov/publications/2023/jcx-35r-23/. For later developments, see KPGM, *Taxation of the Digitalized Economy*, updated March 22, 2024, https://kpmg.com/kpmg-us/content/dam/kpmg/pdf/2023/digitalized-economy-taxation-developments-summary.pdf.

[16] "Section 301—Digital Services Taxes," Office of the United States Trade Representative (USTR), https://ustr.gov/issue-areas/enforcement/section-301-investigations/section-301-digital-services-taxes.

[17] USTR, "USTR Announces, and Immediately Suspends, Tariffs in Section 301 Digital Services Taxes Investigations," press release, June 2, 2021, https://ustr.gov/about-us/policy-offices/press-office/press-releases/2021/june/ustr-announces-and-immediately-suspends-tariffs-section-301-digital-services-taxes-investigations.

[18] USTR, *Section 301 Investigation, Report on France's Digital Services Tax*, December 2, 2019, https://ustr.gov/sites/default/files/Report_On_France%27s_Digital_Services_Tax.pdf.

billion of revenue to market countries and increase global revenues by $13 billion-$36 billion.[19] This amount is considerably smaller than the $220 billion of revenue projected from Pillar 2, and is an increase over a previous estimate of Pillar 1 that projected a reallocation of $100 billion and an associated revenue gain of $5 billion-$12 billion.[20]

Based on 2022 data, the reallocation standards are met by about 19 large U.S. companies using after-tax profit margin and possibly two additional firms using before-tax profits. After eliminating the financial and extractive firms, about 12 large firms appear to be subject to Pillar 1.[21] The top ones include four digital firms—Microsoft, Apple, Alphabet (formerly Google), and Meta (formerly Facebook)—and three pharmaceutical firms—Pfizer, Merck, and Johnson and Johnson. In addition, while Amazon does not qualify as a whole because of the smaller margins for its online marketplace business, the Amazon Web Services Division qualifies.[22] The 13 firms accounted for $53 billion subject to Amount A, with about half that amount due to Apple ($15.8 billion) and Microsoft ($13.2 billion). These amounts are understatements because they are based on after-tax profits; for example, if the tax rate is 21%, Amount A rises to $93 billion.[23] Amazon Web Services accounts for about $3 billion.

A 2021 study of the world's 500 largest firms found that Pillar 1 would affect about 78 companies, with 37 of them from Europe. The total amount allocated would be $87.5 billion, with 45% of that amount from technology companies.[24] Profits from technology among the world's 500 largest firms are 15% of total profits, so the 45% share of reallocated profits from technology is more than three times the share of technology profits for large companies. Part of that effect is from the exclusion of financial and extractive industries, which together account for 48% of total profits of these large firms, and part is because of the size and profit ratio restrictions (technology firms account for 30% of the remaining 52% of profits).

These amounts were based on allocating 20% of profits and would increase to about $109.4 billion if 25% were allocated (although the distribution would remain the same). **Table 1** shows how this amount is distributed relative to shares of world GDP and shares of the profits of the 500 largest companies. The United States accounts for 64% of Amount A, although it accounts for 24% of world production and 38% of profits of large corporations. The 2021 study also found that 45% of the allocation was from technology firms, with most of that (85%) from the United States.

[19] OECD, "Revenue Impact of International Tax Reform Better Than Expected," January 18, 2023, https://www.oecd.org/tax/beps/revenue-impact-of-international-tax-reform-better-than-expected.htm.

[20] OECD, *Tax Challenges Arising from Digitalisation—Economic Impact Assessment*, October 12, 2020, https://www.oecd.org/tax/beps/tax-challenges-arising-from-digitalisation-economic-impact-assessment-0e3cc2d4-en.htm.

[21] Laiba Immad, "25 US Companies With The Highest Profit Margins," *Yahoo Finance*, July 7, 2023, https://finance.yahoo.com/news/25-us-companies-highest-profit-202031331.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAInFPXwtvM5n8KIYPXJInpRXKqfhGhUpIVnt9qhArtNRvxk3vnkXQnCl8dW6I-GLIXsfvUoIN0acI7pc0LQ-hYfaKTtxzzNB1uSQW6DhtCS23nhAaOjfBFBKa8JQVCeLv5qOR_bh77lPXe-xq81s2NggCTAuxcL5k00ZX5Hjk2lz.

[22] Based on Amazon's 10-K report to the U.S. Securities and Exchange Comission, https://d18rn0p25nwr6d.cloudfront.net/CIK-0001018724/c7c14359-36fa-40c3-b3ca-5bf7f3fa0b96.pdf, which reported $22.8 billion of operating income and $80.1 billion of revenues.

[23] This very significant increase is because all of the added back taxes become a part of Amount A. The amount varies by company depending on the profit margin. For example, a firm with a 15% profit margin will have a pretax return at a 21% tax rate of 19% (0.15/0.79), which is a 27% increase in the profit, but Amount A will increase by 80% (9/5).

[24] Michael Devereux and Martin Simmler, *Who Will Pay Amount A?*, EconPol Policy Brief 36, vol. 5, July 2021, https://www.econpol.eu/sites/default/files/2021-07/EconPol_Policy_Brief_36_Who_Will_Pay_Amount_A_0.pdf.

Table 1. Estimated Shares of Amount A, Pillar 1, by Country, 2020

Country/Area	Share of World Gross Domestic Product (GDP)	Share of Profits of 500 Largest Companies	Share of Reallocated Profits (Amount A)	Share of Each Country's Amount A For Technology Firms
United States	24.4%	37.6%	63.8%	85.1%
China	16.3%	18.2%	10.5%	5.8%
Europe	18.9%	21.7%	24.2%	NA
Germany	4.4%	4.5%	1.6%	0.7%
UK	3.2%	4.7%	3.8%	0.0%
France	5.8%	4.5%	0.6%	0.0%
Japan	5.8%	4.5%	0.6%	0.0%

Sources: Data on allocated profits under Pillar 1 and GDP other than Europe from Michael Devereux and Martin Simmler, *Who Will Pay Amount A?*, EconPol Policy Brief 36, vol. 5, July 2021, https://www.econpol.eu/sites/default/files/2021-07/EconPol_Policy_Brief_36_Who_Will_Pay_Amount_A_0.pdf. Data on shares of profits from Benji Hyam, "Most Profitable Companies: U.S. vs. Rest of the World, 2023," Grow and Convert, November 29, 2023, https://www.growandconvert.com/research/most-profitable-fortune-500-companies-in-2023/. Data on GDP for Europe from International Monetary Fund, "GDP Based on PPP, Share of World," October 2023, https://www.imf.org/external/datamapper/PPPSH@WEO/EU/CHN/USA.

Note: NA is not available.

Thus, although Pillar 1 has come to include industries beyond digital companies, its exclusions and restrictions leave much of the focus on these companies. Had Pillar 1's coverage not expanded to other industries between 2020 and 2021, it would have become apparent that the reallocations were almost entirely of profits of U.S.-headquartered firms.

Another study found a somewhat smaller share of Amount A, 56%, from U.S.-headquartered firms, comprising 31 U.S. companies. The next largest share and number of firms is from China. The distribution and number of firms is shown in **Table 2**.

Table 2. Estimated Number of Firms and Shares of Amount A

Country	Number of Firms	Share of Amount A
United States	31	56.0%
China	13	16.7%
Europe	16	14.3%
Rest of Asia	7	11.2%
Canada	1	0.0%

Source: Mona Barake and Elvin Le Pouhaër, *Tax Revenue from Pillar One Amount A: Country-by-Country Estimates*, Paris School of Economics, Working Paper no. 2023-12, March 2023, https://shs.hal.science/halshs-04039288/document.

Note: The study applied the current rules and tax rates but used data from 2016.

Do U.S. Firms Pay Most Digital Services Taxes?

Limited data are available on the revenue generated by DSTs. One source indicated that France and India collect almost $500 million from DSTs, Turkey and the UK $400 million, Italy $300

million, and Spain close to $300 million. The study also indicated that these revenues are around the same magnitude as estimated collections under Pillar 1.[25]

The revenue floor for European DSTs is much smaller than the floor on Pillar 1 reallocations. Nevertheless, the floor means that DSTs are still likely to fall largely on U.S. firms in the digital sector. In addition, some features of DSTs focus more of the revenue collections of U.S. firms, for example, by focusing on two-sided online markets.

The French DST is an illustration. This tax applies to firms that generate at least €750 million (approximately $825 million at current exchange rates) globally and €25 million in France for the covered services. Covered services include advertising and digital intermediation (which includes, for example, online marketplace, social networks, and online dating services).[26] At the time of the study, the French DST imposed the tax on advertising revenues and online marketplaces. The USTR analysis of the French DST concluded that it discriminated against U.S. firms compared to French firms.[27] For example, the DST applies only to two-sided online marketplaces, where platforms serve as a middleman facilitating transactions between consumers who are buying products (the demand side) and companies that are selling products (the supply side). Thus, a French company that sells from its own inventory will not be subject to the tax. The tax applies to hotel rooms booked through firms like Expedia and Booking.com but not to rooms booked through a hotel's website. French taxis arrange rides on their own apps and are not subject to tax, whereas rides arranged on Uber could be. In addition, the French DST, unlike the proposed EU DST, bases the threshold on covered revenues rather than total revenues. Thus, a French DST would not apply to large firms where the covered services were a small portion of their revenues.

The USTR report indicated that eight of the nine firms subject to tax on advertising revenues were U.S. firms. For online marketplaces, 12 of 21 digital intermediation firms were U.S.-based and none were French. The report also indicated that Google (now Alphabet) and Facebook (now Meta) accounted for 75% of digital advertising in France.

The USTR report on the Spanish DST tax made similar observations, with both the floor and features of the tax favoring Spanish companies compared to U.S. companies. This report indicated that 30 U.S. firms will pay the DST, compared to 3 Spanish firms.[28]

The USTR reported that the UK DST, which applies to internet search engines, social media services, and online marketplaces, also has some features that protect domestic firms, including basing revenue floors on taxable services and excluding marketplace delivery fees.[29] The USTR indicated that only two search engines, Google and Bing, would be subject to the UK DST. Data from Statista indicate that Google has a 93.67% share of the internet search engine market in the UK.[30] Amazon dominates the UK online marketplace industry, responsible for 90.6% of the top

[25] Kane Borders et al., *Digital Services Taxes*, EUTAX Observatory, August 2023, https://shs.hal.science/halshs-04174657/file/EUTO_Digital-Service-Taxes_June2023.pdf.

[26] See Ernst and Young, "France Issues Comprehensive Draft Guidance on Digital Services Tax," April 13, 2020, https://taxnews.ey.com/news/2020-0963-france-issues-comprehensive-draft-guidance-on-digital-services-tax.

[27] USTR, *Section 301 Investigation, Report on France's Digital Services Tax*, December 2, 2019, https://ustr.gov/sites/default/files/Report_On_France%27s_Digital_Services_Tax.pdf.

[28] USTR, *Section 301 Investigation Report on Spain's Digital Services Tax*, January 13, 2021, https://ustr.gov/sites/default/files/files/Press/Releases/SpainDSTSection301Report.pdf.

[29] USTR, *Section 301 Investigation Report on the United Kingdom's Digital Services Tax*, January 31, 2021, https://ustr.gov/sites/default/files/files/Press/Releases/UKDSTSection301Report.pdf.

[30] Statista, "Market Share of Leading Search Engines in the United Kingdom (UK) in April 2023," https://www.statista.com/statistics/280269/market-share-held-by-search-engines-in-the-united-kingdom/.

five, with Ebay responsible for 7.5%.[31] One source indicated that 90% of the DST in the UK was paid by 5 firms out of 18 subject to the tax, and "Amazon, Google, Apple, and eBay have publicly acknowledged liability for the DST."[32]

The USTR also provided a comment on the proposed Canadian DST, which indicated the U.S. stance that the tax had features in common with the other DSTs investigated that were actionable under Section 301.[33]

While a review of all of the numerous DSTs imposed and proposed is beyond the scope of this report, these digital services taxes are likely to fall disproportionately on U.S. firms due to their dominant positions in most digital markets, the exclusion of firms with smaller revenues, and the taxes' particular features.

The Justification for Pillar 1 and DSTs

Pillar 1 is a break from rules in place for almost a century. Moreover, the history of both developments indicates that the emergence of DSTs was closely tied to delays and uncertainties about the collection of a share of profits of digital firms by market countries. Pillar 1 and DSTs are generally justified by two claims: that digital firms pay lower taxes that nondigital firms and that taxes in market countries are justified based on user value creation.

Justification 1: Digital Firms Pay Lower Corporate Taxes

There is no conclusive evidence to support this claim, and it is very difficult to actually measure corporate taxes effectively paid, since they depend on deliberate features of tax systems (such as research credits) and timing of deductions, as well as statutory tax rates. The claims made by the EU and the French government were based on a study by PWC and ZEW that used hypothetical tax rates, called effective average tax rates (EATRs), not any actual measure of tax payments as a share of profits.[34] While digital firms may find profit shifting easier because of their concentration in intangible assets, the same is true of many other firms, including pharmaceuticals (drug formulas) and firms profiting from brand identity (e.g., Coca-Cola, Starbucks, Nike, and McDonald's). Apple, which also sells physical products, benefits from brand loyalty as well as its digital assets. Firms can also shift profits by allocating debt to high-tax jurisdictions, and by

[31] Antonia Tönnies, "Amazon Top Competitors in the UK: Marketplaces, GMV & Annual Growth," ECDB, December 18, 2023, https://ecommercedb.com/insights/amazon-top-competitors-in-the-uk-marketplaces-gmv-annual-growth/4712.

[32] Mark Sweney, "UK's Digital Services Tax Reaps Almost £360m From US Tech Giants in First Year," *The Guardian*, November 22, 2022, https://www.theguardian.com/technology/2022/nov/23/uks-digital-services-tax-reaps-almost-360m-from-us-tech-giants-in-first-year. For the original report on the tax, see National Audit Office (UK), *Investigation into the Digital Services Tax, HM Revenue & Customs*, November 23, 2022, https://www.nao.org.uk/wp-content/uploads/2022/11/Investigation-into-the-digital-services-tax.pdf.

[33] USTR, "Comments of the Office of the United States Trade Representative (USTR) on Canada's proposed Digital Services Tax Act," February 22, 2022, https://ustr.gov/sites/default/files/USTR%20Cmts%20on%20Canadian%20DST%20Proposal.2022.02.22.pdf.

[34] PWC, *Digital Tax Index 2017, Locational Tax Attractiveness for Digital Business Models*, https://www.pwc.de/de/industrielle-produktion/executive-summary-digitaliiserungsindex-en.pdf. The USTR study of the French DST pointed out that the authors of this study stated that their study did not support the conclusions of France and the EU. The EATR is a blend of marginal effective tax rates and statutory tax rates that are based on unsupported assumptions. See Jane G. Gravelle, "When Estimated Economic Effects Fail the Sniff Test: Tax Examples," *National Tax Journal*, vol. 76, no. 3 (September 2023), pp. 621-645.

transfer pricing of physical products (i.e., charging lower than arm's-length prices to low-tax jurisdictions).

In any case, the solution to paying low effective tax rates was addressed by Pillar 2, which takes a more general approach that addresses all sorts of industries and imposes additional taxes only in low-tax countries.

Justification 2: Users Create Value

The argument for allocating taxing rights to market countries based on users of digital products creating value is no longer valid for the current Pillar 1 proposal, which now applies to all large profitable firms (as measured by profit margins, not return on capital), where there are often no users creating value. Pillar 1 is now, instead, a limited version of formula apportionment. But unlike formula apportionment based on sales, as used by U.S. states, Pillar 1 is narrowly targeted, with the result that about half the reallocated profits are from technology firms.

Nevertheless, since the value creation idea was the impetus of Pillar 1 and the focus on both size and profit margin tends to target firms with intangible assets, including digital firms, a discussion of this concept is still in order. Not all commentators to the OECD agreed with this concept. Perhaps the strongest defender of the value creation justification for reallocating profits was the European Union. Several years ago, the European Commission said the following:

> Today's international corporate tax rules are not fit for the realities of the modern global economy and do not capture business models that can make profit from digital services in a country without being physically present. Current tax rules also fail to recognize the new ways in which profits are created in the digital world, in particular the role that users play in generating value for digital companies. As a result, there is a disconnect—or "mismatch"—between where value is created and where taxes are paid.[35]

Before discussing value creation, a brief review of the sourcing of income under current, long-standing rules is in order.

Current Sourcing Rules

Long-standing international agreements aimed at preventing double taxation of profits for firms operating in more than one country allocate the first rights to taxation on the basis of where the asset creating the profit is located. For tangible assets such as buildings and equipment, this location is straightforward. For intangible assets such as drug formulas, search algorithms, and brand names, location may be the country where the asset is originally created, or it may be the country where the rights to use the asset are located, based on either paying a royalty to the owner for its use or purchasing the right to use the asset. For multinationals, the country where the parent company is located may also claim a residual right by imposing a tax and allowing a tax credit for taxes paid to the source country.

These rules do not allow any taxation unless there is a permanent physical establishment. If there is a permanent establishment, profits are allocated based on the relative size and nature of assets. For example, a pharmaceutical firm might have a manufacturing facility in country 1, own the rights to a drug formula in country 2, and have a distribution center in country 3, where the final market is. If most of the cost of the drug reflects the value of the formula, then most of the profits would be allocated to country 2. If the drug is directly exported to an unrelated party in country 3,

[35] European Commission, "Questions and Answers on a Fair and Efficient System in the EU For a Single digital Market," March 21, 2018, https://ec.europa.eu/commission/presscorner/detail/en/MEMO_18_2141.

that country would have no taxation rights. Under long-standing international agreements, it is not where the markets are, but where the asset are, that matters.

Many U.S. multinationals have sold the rights to intangible assets to affiliates in other countries to serve foreign markets. This system is aimed at allocating profits between related parties on the basis of arm's-length prices (i.e., the price upon which a willing buyer and a willing unrelated seller would agree to transact). For unique intangible assets, in particular, true arm's-length prices often are difficult to determine because there are no comparable uncontrolled prices. If these prices are set artificially, profits can be shifted out of high-tax countries and into low-tax countries. Any misallocation is generally between the creator of the asset (often the parent company) and the purchaser (such as the foreign subsidiary), but has nothing to do with the market for the goods created.

How Does User Value Creation Fit In?

Perhaps the most serious problem with this concept is confusing creation of value and exchange of value.[36] If a drug is exported to a foreign country, there is an exchange. Customers pay for the drug, and the profits from that sale are allocated in proportion to where the assets creating the drug are located. The only difference between this example and that of, say, a search engine is in how value is exchanged. For a search engine, customers receive value in the form of free use of the search engine. They pay by agreeing to have their data collected and having to look at advertisements. The company makes its profits by selling advertising (whose value depends on targeting based on data collected) and perhaps by selling data to third parties. All of these are exchanges. If users create assets for the company in the form of data, this is still an exchange. The buyer (with its servers and algorithms) now owns another asset, the data it purchased though the exchange of a free search engine with the users who sell their data in exchange for free use, and those assets are now located in the buyer's country.

The exposure to advertisements as a price or part of a price of consuming a good is not a new concept, but has been embodied in television, radio, magazines, and newspapers.

When seen in this light, the value creation concept has muddied the waters about how to allocate profits. That is not to say that profit allocation based on sales cannot be used; as long as it is agreed upon, double taxation can be avoided. However, a partial system that applies to less than 100 firms, as proposed in Pillar 1, will create difficult challenges. Using a sales-based tax formula in a U.S. state only requires a firm to identify its immediate customers, which works well as long as the system covers all of the firms. In a normal regime that allocates profits to customers for a digital firm that earns its profits from advertisers, the profits would be allocated to advertisers, and the advertisers would allocate their profits to their customers, and so on down the chain. This system will not work when there is selective coverage, and tracing final purchasers would be difficult, if not impossible.[37]

[36] This point was made by Angelo Nikolakakis, "Aligning the Location of Taxation with the Location of Value Creation: Are We There Yet!?!," *Bulletin for International Taxation*, November/December 2021, pp. 549-561, https://www.ibfd.org/sites/default/files/2022-02/OECD_International%20-%20Aligning%20the%20Location%20of%20Taxation%20with%20the%20Location%20of%20Value%20Creation%20Are%20We%20There%20Yet!!%20-%20IBFD.pdf.

[37] For a discussion, see Daniel Bunn, "Rushing Headlong into Formulary Apportionment," Tax Foundation, February 28, 2022, https://taxfoundation.org/blog/formulary-apportionment-oecd-tax-deal/.

Economic Effects: Pillar 1 vs. DSTs

The economic effects of the two alternatives from the U.S. perspective will differ depending on who effectively pays the tax: the company and its owners, the government, or customers.

Pillar 1: Economic Effects

Pillar 1 effects are quite straightforward in concept. The reallocation of taxing rights will allocate some profits to the United States as a market country (raising revenues) and will reallocate some profits of U.S.-parented firms to other countries. However, assuming the United States agrees to Pillar 1, additional foreign taxes paid by U.S. firms will earn foreign tax credits. So additional taxes paid to foreign countries will be offset to some extent by a reduction in U.S. revenues.

In 2021, a study found that the United States would gain $12.6 billion in revenue from the reallocation of profits to the United States, but would lose $22.9 billion in additional foreign tax credits, for a net loss of $10.5 billion.[38]

The study reported in **Table 2** has a smaller share of Amount A for U.S. companies, 56% of the share in the study reported in **Table 1**. The analysis of allocation indicates that 34% of Amount A is allocated to the United States as a market country but 7.8% is from other jurisdictions (leaving 26.2% already allocated to the United States). At the Amount A, revenues of $200 billion suggest a revenue gain of $3.3 billion (i.e., $200 billion x 0.078 x 0.21). Some of this tax will be paid by U.S.-parented companies and some by foreign companies.

It is more difficult to determine how much foreign tax credits will increase. Amounts reallocated to market countries from tax havens are reported in **Table 2** as 66% of total Amount A. If U.S. companies have the same share in tax havens as they have in Amount A, 37% (66% times 56%) are in tax havens. According to data in this study, tax rates in the tax havens are 4% and tax rates in the OECD are 26%, so additional taxes of 0.22 x 0.37 x $200 billion, or $13.2 billion, would be owed to foreign governments. If all of these taxes are creditable, these estimates suggest a revenue loss of around $9.9 billion to the federal government and an additional tax liability of up to $3.3 billion for U.S.-parented multinational firms.

Not all of these taxes might generate foreign tax credits since they are based on U.S. tax due on foreign-source income. The Joint Committee on Taxation estimated that tax credits would cover about a third of these taxes.[39] If so, the revenue loss to the Treasury would be $1.1 billion (a $3.3 billion gain minus a $4.4 billion loss due to credits). U.S.-parented companies would pay the remainder of additional foreign taxes of $5.9 billion plus some share of the additional U.S. taxes of $3.3 billion or between $5.9 billion and $9.2 billion. Foreign countries would gain $10.3 billion in revenues due to the reallocation of taxing rights for U.S. firms, and foreign companies would pay some share of the additional $3.3 billion to the U.S. government.

The Joint Committee on Taxation estimated three revenue loss scenarios—$0.1 billion, $1.2 billion, and $4.3 billion—with its preferred estimate being a $1.2 billion loss.[40]

[38] Robert Goulder, "The Cost of Change: Pillar 1 Reduced to the Back of a Napkin," *Tax Notes International*, July 5, 2021, pp. 111-117.

[39] Joint Committee on Taxation, *Background And Analysis Of The Taxation Of Multinational Enterprises And The Potential Reallocation Of Taxing Rights Under the OECD's Pillar One*, JCX-7-24, March 5, 2024, https://www.jct.gov/publications/2024/jcx-7-24/.

[40] Ibid.

Digital Sales Taxes: Economic Effects

DSTs have very different consequences. DSTs are excise taxes (i.e., taxes on sales), not taxes on profits. Generally, excise taxes are passed on to customers. In that case, the tax will be passed on to advertisers (who in turn are likely to pass it on to their customers) and online consumers.

A perfectly competitive market will pass on an excise tax in full. However, in markets with imperfect competition where firms earn excess profits, it is possible that firms will bear some of the tax. In the most extreme form of imperfect competition, where there is a pure monopoly, economics textbooks often teach that 50% of the tax will be borne by the firms and 50% by consumers. This outcome is due to the use of a linear demand curve, which, while simple to explain both mathematically and visually, is not a realistic depiction. A criticism of the use of this linear demand and its special attributes was made over 50 years ago by Bishop (1968); Mixon (1986) also criticized textbook writers for continuing to use the linear examples.[41] If, however, a more realistic constant elastic demand curve is used, the tax is fully passed on. The mathematical derivations for these effects are shown in the Appendix.

There is also empirical evidence that these taxes will be passed on. Although findings are mixed, a large body of empirical research on tobacco and, to a lesser extent, alcohol and fuel excise taxes tends to indicate that these taxes are passed forward in price and, in some cases, more than 100% of the tax is passed forward.[42]

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[41] Robert L. Bishop, "The Effects of Specific and Ad Valorem Taxes," *The Quarterly Journal of Economics*, vol. 82, no. 2 (May 1968), pp. 198-218; and J. Wilson Mixon, Jr., "On the Incidence of Excise Taxes on a Monopolist's Price: A Pedagogical Note," *The Journal of Economic Education*, vol. 17, no. 3 (Summer 1986), pp. 201-203.

[42] Some of these studies use differences in state taxes to estimate the pass-through. Generally, in the cases where they find the producer absorbing part of the tax, it is near the borders where customers from high-tax states could purchase in neighboring lower-tax states. While these state taxes are collected at retail, most retail businesses operate in a competitive environment, which suggests that when part of the tax is not passed on, it is most likely ultimately absorbed by the manufacturer. For recent studies and literature reviews that indicate the tax is largely passed forward in price, see Matthew Harding, Ephraim Leibtag, and Michael F. Lovenheim, "The Heterogeneous Geographic and Socioeconomic Incidence of Cigarette Taxes: Evidence from Nielsen Homescan Data," *American Economic Journal: Economic Policy* vol. 7, no. 4 (2012), pp 169-198, at https://www.jstor.org/stable/23358249; Matthew Harding, Ephraim Leibtag, and Michael F. Lovenheim, *The Heterogeneous Geographic and Socioeconomic Incidence of Cigarette and Beer Taxes: Evidence from Nielsen Homescan Data*, March 2010, at http://www.cemmap.ac.uk/resources/scanner_data/sd10_harding.pdf; Douglas J. Young and Agnieszka Bielinska-Kwapisz, "Alcohol Taxes and Beverage Prices," *National Tax Journal*, vol. 55, no. 1 (March 2002), pp. 57-74; Andrew Hansen and Ryan Sullivan, "The Incidence of Tobacco Taxation: Evidence from Geographic Micro-Level Data," *National Tax Journal*, vol. 62, no. 4 (December 2009), pp. 677-698; Javier Espinosa and William N. Evans, "Excise Taxes, Tax Incidence, and the Flight to Quality: Evidence from Scanner Data," *Public Finance Review*, vol. 41, no. 2 (March 2013), pp. 147-176; Dean R. Lillard and Andrew Sfekas, "Just Passing Through: the Effect of the Master Settlement Agreement On Estimated Cigarette Tax Price Pass-through," *Applied Economics Letters*, vol. 20 (2013), pp. 353-357; and Jon P. Nelson and John R. Moran, "Effects of Alcohol Taxation on Prices: A Systematic Review and Meta-Analysis of Pass-Through Rates," *B. E. Journal of Economic Analysis and Policy*, vol. 20, no. 1, https://www.degruyter.com/document/doi/10.1515/bejeap-2019-0134/html?lang=en. Other empirical work finds the federal excise tax more likely to be passed on than state taxes, see P.G. Barnett, T.E. Keeler, and T. Hu, T., "Oligopoly Structure and the Incidence of Cigarette Excise Taxes," *Journal of Public Economics*, vol. 57 (1995), pp. 457-470. For gasoline taxes, the literature is sparser, but one study finds half the federal tax and all of the state tax passed forward. See Hayley Chouinard and Jeffrey M Perloff, "Incidence of Federal and State Gasoline Taxes" *Economics Letters*, vol. 83, no. 1 (April 2004), pp. 55-60, http://are.berkeley.edu/~jperloff/PDF/gastax.pdf. For studies that find that the gasoline excise tax is passed forward, see James Alm, Edward Sennoga and Mark Skidmore, *Perfect Competition, Spatial Competition and Tax Incidence in the Retail Gasoline Market*, Fiscal Research Center Report No. 112, September 2005, http://aysps.gsu.edu/sites/default/files/documents/frc/report112.pdf. Other studies generally find gasoline and diesel fuel taxes passed forward, but diesel fuel tax pass-through is sensitive to supply conditions; see Justin Marion and Erich Muehlegger, *Fuel Tax Incidence and Supply Conditions*, National Bureau of Economic Research Working Paper No. 16863, March
(continued...)

Apple, Amazon, and Google (now Alphabet) indicate that they passed on the 2% UK tax.[43] Google has a page explaining that a charge for the DST will be added on in countries where ads are accessed.[44]

Although evidence indicates that DSTs will be passed on, firms could lose some profits if quantity demanded decreases. However, this loss is a small part of the burden of the tax on consumers, and would be much smaller. The loss in profits will not reflect the reduction of sales; it will reflect the difference between excess profits and costs, including the normal required return to investment, and it will depend on how consumers respond.

The ratio of total earnings to cost can be found in profit margins. The profit margins for five digital companies were as follows: Microsoft, 36.7%; Apple, 27.3%; Alphabet, 21.2%; Meta, 20.0%; and Amazon, 2.25%.[45] These companies, except for Amazon, were selected to have profit margins in excess of 10% and be large enough to be covered in Pillar 1. DSTs cover firms based on size (with smaller thresholds than Pillar 1) and not profit margin, so the overall profit margins will likely be smaller.

One data set examined profits by industry for large companies and found an average profit margin of 8.54%, and 7.58% when financial firms were excluded.[46] These profits margins varied considerably by industry. For example, the study found margins of 3.49% for information services, 20.35% for software entertainment, 19.14% for software systems and applications, and 14.32% for software used to support the internet. Another source says a typical net margin for e-commerce is 10%, but this probably applies largely to firms that sell their own products rather than third-party intermediaries such as Amazon, so it reflects the return both to digital services and to retailing the product itself.[47] Another source reported a net profit margin for information at 4.45%.[48]

2011, http://www.nber.org/papers/w16863. A recent study suggests that diesel fuel taxes are largely passed forward, with greater pass-through the higher up the tax is in the supply chain. See Wojciech Kopczuk et al., *Do the Laws of Tax Incidence Hold? Point of Collection and the Pass-through of State Diesel Taxes*, National Bureau of Economic Research Working Paper 29410, September, 2013. See also a recent working paper, Tsvetan Tsvetanov, *Tax Holidays and the Heterogeneous Pass-Through of Gasoline Taxes*, Working Papers Series in Theoretical and Applied Economics, University of Kansas, Department of Economics, 2022, https ://ideas.repec.org/p/kan/wpaper/202219.html, which has a literature review.

[43] Mark Sweney, "UK's Digital Services Tax Reaps Almost £360m From US Tech Giants in First Year," *The Guardian*, November 22, 2022, https://www.theguardian.com/technology/2022/nov/23/uks-digital-services-tax-reaps-almost-360m-from-us-tech-giants-in-first-year.

[44] Google Ads, "Jurisdiction-Specific Surcharges," Google Ads Help, https://support.google.com/google-ads/answer/9750227.

[45] Except for Amazon, profit margins were for 2022 and from Laiba Immad, "25 US Companies With The Highest Profit Margins," *Yahoo Finance*, July 7, 2023, https://finance.yahoo.com/news/25-us-companies-highest-profit-202031331.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAInFPXwtvM5n8KIYPXJInpRXKqfhGhUpIVnt9qhArtNRvxk3vnkXQnCl8dW6I-GLIXsfvUoIN0acI7pc0LQ-hYfaKTtxzzNB1uSQW6DhtCS23nhAaOjfBFBKa8JQVCeLv5qOR_bh77lPXe-xq81s2NggCTAuxcL5k00ZX5Hjk2lz. For Amazon, profit margins were for mid-year 2022, at "Amazon Profit Margins," Macrotrends, https://www.macrotrends.net/stocks/charts/AMZN/amazon/profit-margins.

[46] These data are collected by Aswath Damodaran, at https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html, and https://fullratio.com/profit-margin-by-industry.

[47] "What Are Good Ecommerce Profit Margins (& How To Maximize Yours)," Cogsy, https://cogsy.com/blog/good-profit-margin-ecommerce/#:~:text=In%20ecommerce%2C%20the%20average%20gross,widely%20considered%20bad%20profit%20margins.

[48] "Information Services Profit Margin 2010-2023," Macrotrends, https://www.macrotrends.net/stocks/charts/III/information-services/profit-margins.

In addition to limiting the fraction of the tax based on profit margin, which would likely be very small for online intermediaries of retail sales but could be larger for other companies, this excess profit would also be reduced, in the steady state, by the share that is a normal required return. The share of the profit margin that is a normal return to investment is very difficult to determine for these firms, which rely on intangible assets that are not well measured in financial data. Moreover, the return required to attract investors may be high because of greater risk.

A third factor that would reduce the share is that it would be multiplied by the price elasticity of demand. There is currently limited evidence on this issue, but most indicates that demand is relatively unresponsive. For example, one study estimated that the price elasticity of demand for internet users was between 0.25 and 0.5.[49] A study of the Korean e-book market found elasticities of around 0.75.[50]

Putting these effects together suggests a relatively small share of the tax would fall on companies due to reductions in extraordinary profits. For example, for digital services, if the profit margin is 25%, the share of excess profits is 50%, and the elasticity is 0.5, companies would lose profits of 6.25% of the digital tax (0.25 times 0.5 times 0.5). For online market intermediaries with third parties, it would be negligible.

In sum, DSTs are borne by consumers and most likely by citizens in the countries where the taxes are imposed, similar to other excise taxes imposed on items such as alcohol and tobacco.

One undesirable consequence for countries that impose DSTs is lowered consumption (although by only a small amount because the taxes are small). There is no obvious reason for discouraging consumption of digital goods, as in the case of excise taxes on goods such as alcohol and tobacco (so called sin taxes). Some excise taxes (such as those on gasoline) are also justified as benefit taxes (to build roads, for example, as is the case in the United States). None of these justifications appear to apply to digital products.

Economic costs would also be imposed, in terms of efficiency, if the United States imposes retaliatory tariffs.

[49] Rajeev K. Goel et al., "Demand Elasticities for Internet Services," *Applied Economics*, vol. 38., no. 9 (2006), pp. 975-980, https://www.tandfonline.com/doi/pdf/10.1080/00036840600581448.

[50] Eunkyoung Lee and Byungtae Lee, *Changing Price Elasticity of Digital Goods: Empirical Study from the E-book Industry*, 2013, https://core.ac.uk/download/pdf/301361227.pdf.

Appendix: Pass-Through of Excise Taxes with Market Power

The two extremes of market structure are perfect competition and monopoly. Most market structures lie somewhere in between. In perfect competition, the supply curve is perfectly elastic as increases in output are achieved by new firms entering the industry. Firms have no profits and are price takers (i.e., cannot influence price) and ultimately must pass on any excise tax in cost. Even market structures where there is imperfect competition will still not have profits above the normal return as long as there is entry.

Monopolies rarely exist, and they are typically regulated. However, firms may have market power if there are barriers to entry. In this case, an individual firm can be depicted as having a downward-sloping demand curve, as in the case of a monopolist selling a similar or a differentiated good. Each firm assumes its market conditions are not affected by others, although a contraction in output by one firm, with aggregate demand fixed in the overall market, will expand demand for other firms. This analysis examines the optimization process for an ad valorem tax in a firm facing a downward-sloping demand curve. For a firm with market power, it is reasonable to assume a constant marginal cost (whereas a natural monopoly, such as a cable company, tends to have a downward-sloping marginal cost curve). A constant marginal cost assumes that firms have constant returns to scale and can produce additional amounts at the same cost. A rising marginal cost curve could also be considered, but it would not change the outcome for passing through the tax.

The firm's profits (Π):

$$(5)\ \Pi = P(Q)Q(1-t) - cQ$$

Where P is price, Q is quantity, t is the tax rate, and c is the marginal cost.

To totally differentiate this equation and obtain the maximum profit, given t:

$$(6)\ (PdQ + QdP)(1-t) - cdQ = 0$$

This analysis considers a constant elasticity of demand function:

$$(7)\ Q = AP^{-Ed}$$

Where A is a constant and Ed is the absolute value of the elasticity of demand.

For this function,

$$(8)\ dQ/Q = -Ed\ (dP/P), \text{ or}$$

$$(9)\ dP = -(1/Ed)(P/Q)dQ.$$

Substitute (9) into (6) and solve for P:

$$(10)\ P = (Ed/(Ed-1))c/(1-t)$$

Compare (10) with and without the tax and the result is that P_t, the price after the tax is compared to the price without the tax, or:

$$(11)\ P_t - P = tP/(1-t).$$

Because the tax is an ad valorem tax, the price rises by slightly more than $P_{t;}$ for a 2.3% tax, it rises by 2.35%.[51]

Textbooks sometimes teach that a monopolist passes on half of the cost of an excise tax to the consumer, and the same analysis would apply to a monopolistic competitor facing a downward-sloping demand curve. This outcome, however, is an artifact of a linear demand curve which must intersect the x and y axis.

To solve for the effect with a linear demand curve, the demand function is:

(12) $P = a-bQ$

where a and b are constants.

This function can be solved by substituting (16) directly into the profit function:

(13) $\Pi = (a-bQ)*(Q(1-t)) - cQ$

Differentiating (13), holding t constant, and finding the profit maximum,

(14) $(a-2bQ)(1-t) = c$

Solving (14) for Q and substituting it into (12) leads to the price equation:

(15) $P = a/2 +c/(2(1-t))$

With an ad valorem tax, the pass-through is equal to $(1/2)\ (t(1-t))*c$ which passes through ½ of the portion of tax on c and thus less than half of the total tax appears in price.

Although the use of a linear demand function is commonly taught in discussing the pass-through of taxes (perhaps because it requires simpler mathematics or can be expressed graphically), it is an unlikely demand function. It results in a quantity equal to zero at a finite price, and a quantity equal to a finite amount at a zero price. It is difficult to imagine any utility function that produces a linear demand function.

There are also demand curves of the log-linear type, such as:

(16) $Q = Ae^{-bP}$

which is a log-linear function (when expressed in logs it is $\ln(Q) = \ln(A) - bP$).

Without repeating the estimates, this function passes through the amount of the tax on c. Although this function is a curve, it still crosses the y axis. If the log linear relationship is reversed, all of the tax is passed forward but the quantity becomes zero at a finite price; it crosses the x axis.

Given the findings with respect to the more appropriate curved demand curve used earlier, it seems more likely that the tax is passed forward in full.

There is a more detailed literature on the effects of imperfect markets on shifting of taxes, but largely they depend on the shape of the demand curve. Linear or concave demand curves can cause undershifting of the tax, but convex demand curves are more commonly seen as realistic.[52]

[51] Note that had the tax been a unit tax, a fixed tax τ, so that in equation (5) the tax would be added to c rather than subtracted from revenues. In that case the price would go up more than the tax: $P = (Ed/(Ed-1))*(c+\tau)$.

[52] For a brief review, see Jon P. Nelson and John R. Moran, "Effects of Alcohol Taxation on Prices: A Systematic Review and Meta-Analysis of Pass-Through Rates," *B. E. Journal of Economic Analysis and Policy*, vol. 20, no. 1, https://www.degruyter.com/document/doi/10.1515/bejeap-2019-0134/html?lang=en.

Author Information

Jane G. Gravelle
Senior Specialist in Economic Policy

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