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Abstract

The 2017 Tax Cut and Jobs Act lowered the US corporate tax rate and introduced provisions to curb profit shifting. We combine survey data, tax data, and firm financial statements to study the evolution of the geographical allocation of US firms' profits after the reform. Between 2017 and 2020, the share of profits booked abroad declined by 1–5 percentage points, in part related to repatriations of intellectual property to the US. However, the share of foreign profits booked in tax havens remained stable at around 50%. While aggregated changes in profit allocation are small, a number of firms responded strongly.

Keywords — multinational corporation; corporate taxation; profit shifting; effective tax rate; country-by-country reporting; Tax Cuts and Jobs Act
JEL — F23, H25, H26, H32.

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1 Introduction

A growing body of research shows that multinational corporations shift a large fraction of their foreign profits—profits booked by firms outside of their headquarter country—to tax havens (e.g., Tørsløv et al., 2022; Garcia-Bernardo and Janský, 2024). US multinationals appear to shift a particularly large fraction of their foreign income to low-tax places (e.g., Dowd et al., 2017; Clausing, 2020a; Guvenen et al., 2022; Laffitte and Toubal, 2021).

The Tax Cuts and Jobs Act (TCJA), enacted at the end of 2017, dramatically changed the profit-shifting incentives faced by US corporations. The Act lowered the US federal corporate income tax rate from 35 to 21 percent, reducing the gap between US and foreign rates. The United States switched from a worldwide tax system—in which the foreign profits of US firms were, upon repatriation, subject to taxation in the United States—to a territorial tax system—in which foreign profits are generally exempt from US taxes.[1] To reduce the incentives to shift profits to tax havens, the Act also introduced three provisions: a US tax on foreign income subject to low tax rates abroad; a reduced rate on foreign income derived from intangibles booked in the United States; and measures to limit the deductibility of certain payments suspected to shift income out of the United States.

This paper asks one key question: How has the international allocation of US firms' profits evolved after the Tax Cuts and Jobs Act? Specifically, has profit shifting to tax havens declined? And if so, have profits shifted back to the United States? These questions are important in light of ongoing policy discussions about an international agreement on a minimum corporate tax (OECD, 2021). If the TCJA substantially curbed profit shifting, further reforms may be less urgent than commonly thought. But if sizable profits are still booked in low-tax places, new policy measures may be warranted.

This paper addresses these questions by combining and reconciling all publicly available data on the location of US firms' profits. Our main contribution is to provide the first comprehensive analysis of trends in profit shifting after the Tax Cuts and Jobs Act. This was difficult until recently because of the delays involved in the publication of the key survey and tax data needed to conduct

[1] In practice, territorial systems (including the new US system) usually have anti-avoidance provisions to prevent firms from shifting domestic profits abroad; and most systems—including the new US tax system and the pre-Tax Cuts and Jobs Act one—can be characterized as hybrid.

this analysis. Tabulations of the 2019 Bureau of Economic Analysis survey of the activities of US multinationals were published in November 2021 and the 2019 IRS country-by-country statistics in April 2022. Due to the lack of comprehensive data, previous research on this issue had to focus on case studies of specific firms or industries. Using a sample of the largest 10 pharmaceutical multinationals, Sullivan (2020) finds no evidence of profit shifted back to the United States. Coffey (2021) studies changes in the use of Ireland as a tax haven by US multinational companies. By contrast, we study trends in profit shifting for US firms as a whole. The data sources we use go up to 2019 or 2020, allowing us to capture two or three years post-reform and to provide a clear picture of the dynamic of profit shifting after the Tax Cuts and Jobs Act. Our analysis carefully accounts for the specificities of each data source and addresses the different pitfalls involved in the measurement of profit shifting, including double-counting issues.

Our main statistics of interest are the fraction of US firms' profits booked in the United States vs. abroad, and the fraction of their non-US profits booked in tax havens. We provide a thorough descriptive analysis of changes in these statistics, relating their evolution to incentives introduced by the Tax Cuts and Jobs Act, and reconciling macro-level tabulated survey and tax data with micro-level public corporate financial statements. Our main findings are the following.

First, there is evidence that, consistent with incentives introduced in the law, US corporations book a larger share of their profits in the United States post reform. This change, however, is relatively small: the share of profits booked abroad has decreased by about 1–5 percentage points, to about 27% for all US companies. A forensic analysis of listed corporations reveals six cases of large companies (Alphabet, Microsoft, Facebook, Cisco, Qualcomm, Nike) with a decrease in the share of foreign earnings of over 20 percentage points that appears clearly related to changes in profit shifting, more precisely to repatriation of intellectual property to the United States. These large firms drive the macroeconomic decline in the share of US multinationals' profit booked outside of the United States.

Second, the geographical allocation of the foreign profits of US multinationals does not appear to have been significantly affected by the Act. Across data sources, the share of foreign profit booked in tax havens has remained stable at around 50% between 2015 and 2020. The similarity of findings across independent sources suggests that the high and stable share of haven profits over this period is robust. Since the share of profits outside of the United States has only slightly

declined (to about 27% for all US corporations), the share of total (domestic plus foreign) profits booked by US corporations in tax havens has remained around 13%–15% throughout the 2015-2020 period, a historically high level. Thus, although a few firms responded to incentives introduced by the Act—sometimes with dramatic effects at the micro level—the global allocation of profits by US firms appears to have changed relatively little overall. This heterogeneity among firms' reactions is reflected in the regression analysis that we use to investigate whether the sensitivity of profits to tax rates differs before and after the reform.

Quantifying this evolution is important because the Tax Cuts and Jobs Act is the largest change to US corporation taxation since 1986 and its provisions have a priori ambiguous effects (Auerbach, 2018; Slemrod, 2018; Chalk et al., 2018; Hanlon et al., 2019). The lower US rate—as well as the measures introduced to limit profit shifting, such as the minimum tax on foreign income known as Global Intangible Low-Taxed Income (GILTI)—reduce the incentives for US firms to book profits in tax havens. However, the move to a territorial system increases the incentives to shift income to low-tax countries. Moreover, certain aspects of GILTI give US firms incentives to move tangible capital to low-tax countries (Clausing, 2020a).

Methodologically, our contribution is to reconcile the available evidence on the location and taxation of the profits of US firms. There is a lively debate on the size of profit shifting and a body of work investigating the pros and cons of various data sources and series (e.g., Tørsløv et al., 2022; Dowd et al., 2017; Guvenen et al., 2022; Clausing et al., 2016; Wright and Zucman, 2018; Bilicka, 2019; Blouin and Robinson, 2020; Clausing, 2020b; Garcia-Bernardo, Janský et al., 2021; Dyreng et al., 2022). Taking stock of this body of work, we show that the different sources paint a consistent picture once the definition of profit is harmonized, the specificity of each source (e.g., sample of firms covered) is accounted for, and any double-counting (when it exists) is removed. Our paper also adds to the body of work investigating the effect on profit shifting of government policies such as the shift to territorial taxation (e.g., Liu et al., 2020; Liu, 2020), changes in controlled-foreign corporations rules (e.g., Clifford, 2019) or increases in monitoring and enforcement (e.g., Bustos et al., 2022). Relative to this literature, we provide a comprehensive analysis of the combined effects of what is arguably one of the largest international tax reforms of the last decades.

The rest of this paper proceeds as follows. Section 2 presents the data sources and describes our methodology. Section 3 discusses our findings on the US vs. foreign split of US corporations'

profits, and Section 4 studies changes in the location of foreign profits. Section 5 investigates whether the sensitivity of profits to tax rates differs between the periods before and after the TCJA. Section 6 concludes.

2 Data and Methodology

In this section, we introduce the data sources on the profits of US multinational companies and we briefly describe how we constructed our main macroeconomic statistics of interest, i.e., the share of US corporations' profits made abroad, and the share of foreign profits booked in tax havens. We present the data sources in more detail in Appendix A and we describe in more detail the construction of the harmonized statistics in Appendix B.

2.1 Data on the Profits of US Multinational Companies

We use four data sources to study the activities of US multinational companies: national accounts; surveys conducted by the Bureau of Economic Analysis (BEA); company financial statement collected in Compustat; and country-by-country data collected by the Internal Revenue Service. The data sources differ in what companies they cover: all US corporations (macroeconomic accounts), multinational corporations (BEA survey and country-by-country data), and listed corporations (Compustat).

First, we start by building the most comprehensive aggregates possible, namely total domestic and foreign profits for all US corporations, using national accounts data.

Second, the Bureau of Economic Analysis (BEA) conducts mandatory surveys of the foreign operations of US multinational companies. These surveys are the raw source used by BEA to produce its international economic accounts, including balance of payments statistics and activities of multinational enterprise statistics. As our preferred measure from the surveys, we use the variable "profit-type return". For comparison, we also report results using direct investment income. In contrast to direct investment income, profit-type return is not pro-rated by the ownership stake of the parent—it includes all profits of majority-owned affiliates and excludes those of minority-owned affiliates—and is gross of foreign income taxes. Once foreign taxes are removed, profit-type return and direct investment equity income line up well on aggregate.

The third main data source to study US multinationals is companies' public financial statements (annual 10-K filings to the Securities and Exchange Commission), collected in S&P's Compustat North America. Compustat covers listed corporations; it excludes private companies which do not have to publicly disclose their accounts. The vast majority of listed firms report a breakdown of their global profits into US vs. non-US. However, profits are not broken down by country.

The fourth main data source is the country-by-country data published by the Internal Revenue Service. These data, available from 2016 onward, cover all US-headquartered multinationals with annual revenue over $850 million. An advantage of country-by-country statistics is that these data may more closely reflect how US firms allocate profits for tax purposes than other data sources. Multinationals are required to report profits by "tax jurisdictions"— the IRS states that "a business entity is generally considered a resident in a tax jurisdiction if, under the laws of that tax jurisdiction, the business entity is liable for tax therein."

2.2 Methodology: Construction of Domestic, Foreign, and Haven Profit

Our main macroeconomic statistics of interest are (i) the share of US corporations' profits made abroad, and (ii) the share of foreign profits booked in tax havens. We first estimate aggregate domestic and foreign profits. Our goal is to construct aggregate series that maximize comparability across sources (e.g., based on the same definition of profit); that are comprehensive (i.e., covering the largest sample of firms possible); and that are consistent (e.g., without double counting and with a consistent treatment of taxes and depreciation, so that meaningful ratios of foreign to total profits can be constructed).

Macroeconomic accounts (all corporations). We start by building the most comprehensive aggregates possible, namely total domestic and foreign profits for all US corporations, using BEA's National Income and Product Accounts (NIPA) and International Economic Accounts.

BEA survey (multinationals). Next, we construct aggregate domestic and foreign profits for multinational companies in the BEA survey. US profits are computed as profit-type return of parents. Foreign profits are computed as profit-type return of majority-owned affiliates. Both domestic and foreign profit so defined are net of book (not economic) depreciation. Before 1994,

profit-type return (for both parents and foreign affiliates) is computed as net income plus foreign income taxes paid minus income from equity investment minus capital gains.

Compustat (listed firms). We compute total US and foreign profits for US listed firms in Compustat. Global profits are variable *pi* and foreign profits variable *pifo*. All listed firms report their global profits. Since 2010 we observe foreign profits for about 95% of listed firms weighted by global profit.

Country-by-country data (multinationals). Finally, we compute total domestic and total foreign profits in the country-by-country data. The main drawback of existing country-by-country data is that they can double count profits. Until 2020, OECD guidelines did not explicitly instruct companies to remove intra-group dividends from profits. When intra-group dividends are included, profits can be counted multiple times when they flow through chains of holding companies. We address this issue in Section B.2 below. Specifically, we use Compustat and other sources to estimate total domestic and foreign profits which should in theory (given reporting threshold requirements) be reported if there was no double-counting, and re-scale the country-by-country data so that they match these totals, building on Horst and Curatolo (2020). A detailed of the correction process is provided in the Appendix Section D.

Consistency across sources. Table A1 in the Appendix compares the amount of foreign profits earned by US multinationals across sources. All series reported in this table are on a pre-tax basis and based on book depreciation. The absolute amounts line up well. The differences in aggregate totals reflect differences in the sample of firms covered.

3 Evolution of the Share of Profits Made Abroad

3.1 Foreign vs. Domestic Profits: Aggregate Data

We begin by examining whether the 2017 Tax Cuts and Jobs Act affected where US corporations book their profits globally. Figure 1a displays the evolution of the share of profits booked abroad by all US corporations (macroeconomic accounts), multinational corporations (BEA survey and country-by-country data), and listed corporations (Compustat). Two main results emerge.

First, the foreign share of profit is relatively similar across sources. It ranges from 30% to 45% across sources in 2019-2020, reflecting the different underlying samples of firms. Multinationals naturally have a higher foreign profit share than all US corporations, which includes firms with no affiliates abroad (including small single-owner firms, such as incorporated self-employed individuals). The gap was significant in the 1980s and early 1990s but has become smaller in recent decades as multinationals captured by the BEA survey account for a high and growing share of all US corporate profits. Listed companies have the highest foreign profit share, as listed firms tend to be larger and more internationalized. The foreign share in our corrected country-by-country data lies in between that seen in Compustat and in the BEA survey.

Second, in all series, the foreign profit share fell 1–5 percentage points between 2017 (the year immediately preceding the Tax Cuts and Jobs Act) and 2020 (the last year in our study). There is agreement across sources that the trend is towards a slightly higher share of profits being booked in the United States. The evolution by sector (shown in Appendix Figure A7) reveals some heterogeneity in responses following the TCJA. While the Information sector displays a pronounced and sustained decline in the foreign share of profits from 2017 onward, other sectors show more muted or inconsistent patterns. Notably, the Finance sector shows virtually no change over this period, and in three of the five sectors depicted, the 2019 foreign profit share exceeds its 2017 level. Also, there is no evidence of a systematic fall in 2018-19 from the sectoral perspective (Appendix Figure A7). These sectoral trends contrast with the overall downward movement seen in aggregate data (Figure 1a), which is in part related to a small number of large firms. This suggests that the aggregate decline is not reflective of a broad-based sectoral response but rather concentrated within specific industries or firms.

Given that the share of foreign profits fluctuates in the short run (Fig. 1a), the small post-TCJA decline could reflect factors other than the reform itself. We examine and exclude three possibilities. First, the COVID-19 pandemic might have distorted the series. In 2020 the BEA data show an increase in the foreign-profit share, driven by a sharper fall in domestic than in foreign profits of U.S. multinationals. We exclude 2020 from the main BEA series because of these distortions. However, once we control for business-cycle conditions (Appendix Fig. A2 and Table A3), the COVID-related spike disappears. Moreover, when including both 2020 and 2021 in

the Appendix (Appendix Figures A2, A3, A13 and A14), the evidence shows 2020 was an outlier and the downward trend resumes in 2021.

Second, differences in the timing of business cycles between the United States and the rest of the world could drive short-term movements. To test for this, we estimate a regression of the share of foreign profits on (i) U.S. real GDP growth, (ii) foreign real GDP growth, and (iii) the percent change in the broad nominal U.S. dollar index (Appendix Fig. A2 and Table A3). We obtained the relevant data from the World Bank.[2] Results are robust: the post-TCJA decline in the unexplained (residual) foreign-profit share remains about 2 p.p. relative to 2017 (Appendix Fig. A2).

Third, exchange-rate fluctuations could matter, since an appreciation of the dollar reduces the value of foreign profits when expressed in USD. In addition to the regression control described above, we construct a currency-adjusted series by re-expressing foreign profits using nominal bilateral USD exchange rates by country, normalizing each country's rate to its 2017 level and scaling reported profits accordingly (Appendix Fig. A3). The currency-adjusted series shows that exchange rates do not explain the observed decline. Taken together, these adjustments reinforce the evidence that the TCJA played a central role in the decline of foreign profit shares.

3.2 Firm-Level Case Studies

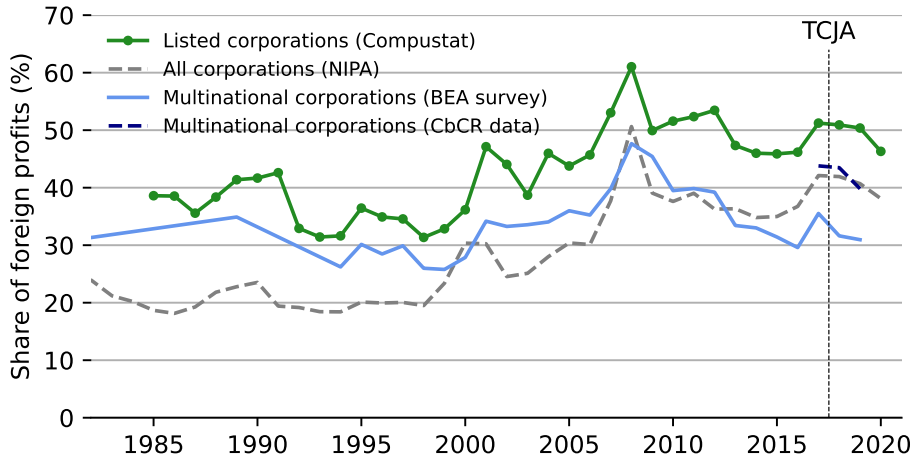
To learn more about the potential contribution of the TJCA, we turn to Compsutat firm-level data. We identify all the firms that experienced a sustained decline (defined as lasting through to the end of our study, 2020) of the foreign share of profit of at least 10 or 20 percentage point post-Tax Cuts and Jobs Act. We then manually check the annual 10-K of these firms to understand the origin of the decline, as detailed in Appendix E.

Our methodology identifies 23 firms with positive profits over the 2017–2020 period, more than $10 billion in revenue at least one year during the period, and a more than 20 points drop in the foreign profits share post-Tax Cuts and Jobs Act (Figure 1b). In 6 cases (Alphabet, Cisco, Facebook, Microsoft, Nike, and Qualcomm), the decline is unambiguously (or very likely) related to changes in profit shifting strategies, specifically repatriation of intellectual property to the United

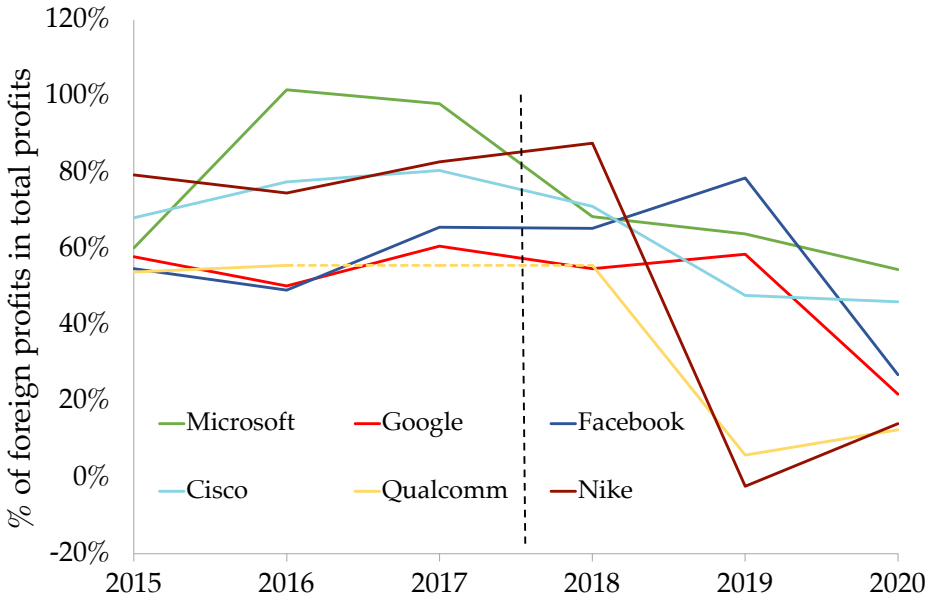
[2]Specficially, we obtained annual real GDP data directly from the World Bank (indicator *NY.GDP.MKTP.CD*). Foreign GDP is calculated as world GDP minus US GDP. We obtained yearly values of the dollar index (measuring aggregated exchange rates) from the FRED (indicator *DTWEXBGS_PCH*); for early gaps we backfill with *DTWEXB_PCH* and, if needed, *DTWEXM_PCH*.

Figure 1: Foreign Share of Profits of US Firms

(a) Foreign Profits (% All Profits)



(b) Firms with a Large Drop in Foreign Profit



Note: Panel (a) shows the ratio of pre-tax profits booked outside of the United States to total (domestic plus foreign) pre-tax profits for all corporations (using National Income and Product Account data), multinational corporations (using the BEA survey and country-by-country data), and listed corporations (using Compustat). See text for computation of foreign and domestic profits in each source. In Compustat, the sample includes all firms headquartered in the United States with non-missing *pifo* and profits are winsorized at the 99th and 1th percentile. Due to the COVID-19 pandemic, in 2020 the BEA data show an increase in the foreign-profit share, driven by a sharper fall in domestic than in foreign profits of U.S. multinationals. We exclude 2020 from the main BEA series because of these distortions. However, once we control for business-cycle conditions (Appendix Fig. A2 and Table A3), the COVID-related spike disappears. Moreover, when including both 2020 and 2021 in the Appendix (Appendix Figures A2, A3, A13 and A14), the evidence shows 2020 was an outlier and the downward trend resumes in 2021. Panel (b) shows the evolution of the foreign share of profit for listed multinationals with a 20 points or more decline in the foreign share linked to changes in profit shifting strategies. See Appendix E for details on sample construction.

States. For instance, Alphabet states in its 2020 annual 10-K that: *"As of December 31, 2019, we have simplified our corporate legal entity structure and now license intellectual property from the U.S. that was previously licensed from Bermuda resulting in an increase in the portion of our income earned in the U.S."* In 6 additional cases, there is some limited evidence that the decline may be partly profit-shifting related. In the remaining 11 cases, there is no evidence that changes in profit shifting are involved. Appendix Table A4 discusses each case. Around 90% of listed firms with positive profits over the 2017–2020 period and more than $10 billion in revenue (at least one year during the period) experience no large change (defined as a sustained decrease of more than 20%) in their foreign earnings share.[3] Thus both in dollar-weighted and unweighted terms, the domestic vs. foreign profit split appears relatively little changed after the Act.

To form a lower bound for the contribution of changes in profit shifting strategies to the decline in the aggregate foreign profit share, we compute the amount of profit that would be booked by Alphabet, Cisco, Facebook, Microsoft, Nike, and Qualcomm outside of the United States in 2020 if their foreign income share had remained equal to its pre-Tax-Cuts-and-Jobs-Act level. We find that the foreign share of US corporations' profits would be 2.8 points higher in 2020.[4] To form an upper bound, we do the same computation but for all 22 firms with a 20 points or more sustained drop in the foreign income share, whether or not there is explicit evidence that the decline is profit-shifting related. We find that US corporations' foreign income share would be 4.2 points larger in 2020. These results suggest that changes in profit shifting strategy can account for a significant fraction of the 1–5 percentage point decline in the foreign share of US corporations' profit, and that the repatriation of intellectual property by a few large tech companies accounts for most of this drop.[5]

The decline in foreign income observed for some firms is consistent with incentives introduced in the Tax Cuts and Jobs Act. The Act introduced a reduced rate on foreign income derived from intangibles booked in the United States known as FDII (foreign-derived intangible income). Royalties earned on exports of the right to use intellectual property booked in the US are taxed

[3]There are 219 listed firms with positive profits over the 2017–2020 period and more than $10 billion in revenue at least one year during the period. Out of this sample, 23 (i.e., 10.5%) experience a 20% or more sustained decline in their foreign earnings share after the Act. Figure A6 in the Appendix shows the evolution of foreign profits for all listed firms between 2015-16 and 2018-20.

[4]We estimate that Alphabet, Cisco, Facebook, Microsoft, Nike, Qualcomm would have booked $61 billion extra in the United States, which is 2.8% of the $2,194 billion in total pre-tax profits made by US corporations in 2020.

[5]Considering firms with a 10 percentage points or more decline in the foreign earnings share yields similar findings.

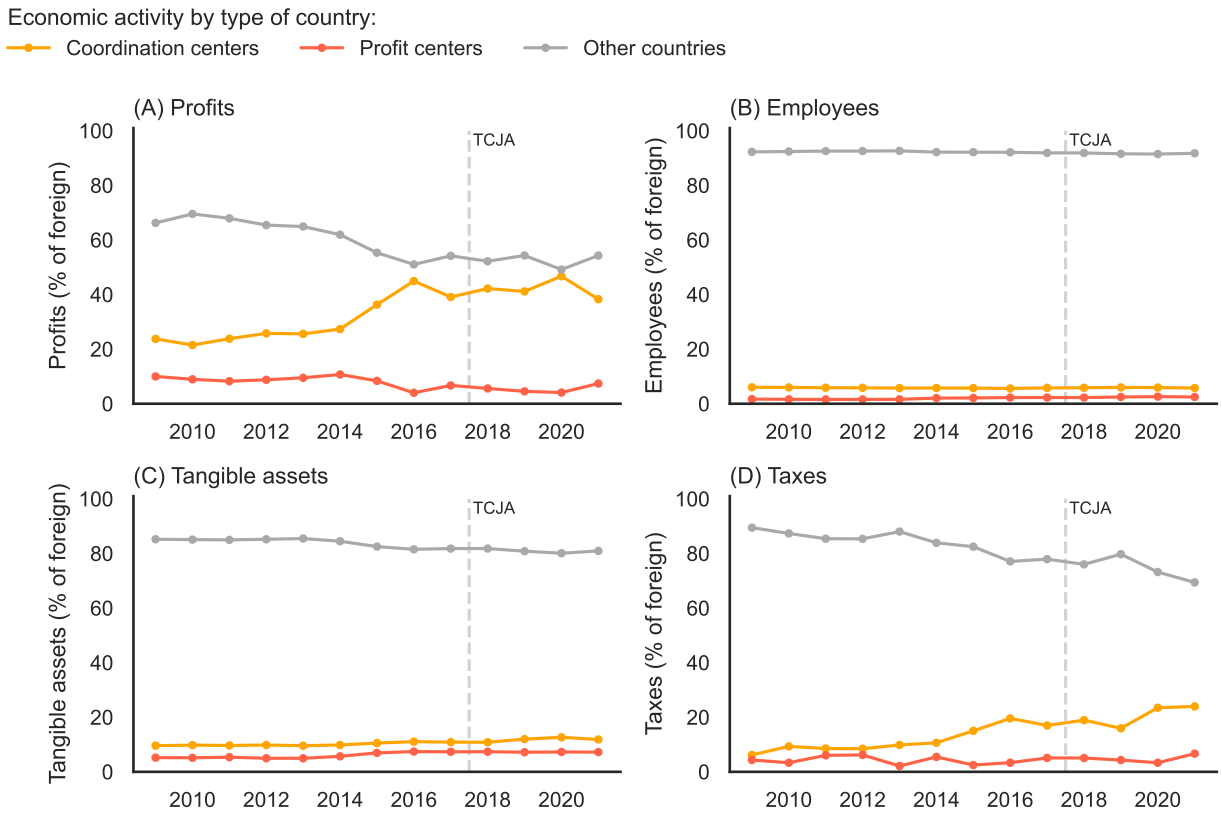
at 13.125%. The law also introduced a new tax on foreign income subject to low tax rates abroad, known as GILTI (global intangible low-taxed income).

An important caveat when interpreting changes in profit shifting after 2017 is that the Tax Cuts and Jobs Act coincided with other major international law changes. Most importantly, in 2020 Ireland phased out the "Double Irish" structure which allowed companies like Alphabet to book income in subsidiaries incorporated in Ireland but taxable in Bermuda (see e.g., Zucman, 2014, for a description of this scheme). Alphabet would probably have moved its intellectual property out of its Irish/Bermuda subsidiary even absent the Tax Cuts and Jobs Act, although provisions introduced in the Act may have been the reason why it chose to move it to the United States. For that reason, the observed decline in the foreign income share of US companies should probably be seen as an upper bound for the effect of the Tax Cuts and Jobs Act.

4 Evolution of the Geography of Foreign Profits

Next, we examine how the *foreign* earnings of U.S. multinationals have shifted geographically, with a focus on the share booked in tax havens (Figure 2A).

Figure 2: Share of foreign profits, employees and tangible assets



Notes: Economic activity disaggregated by type of country. (A) Profit-type return (B) Number of employees (C) Tangible assets (D) Taxex paid. See text for definition of profit center and coordination centers.

Source: BEA survey. The same figure using other data sources is available in the Appendix Figs. A9 and A10.

We are interested in profit booked in individual tax havens as well as tax havens as a group. To discuss the results, we group the tax havens in two categories, as in Reurink and Garcia-Bernardo (2020): "profit centers" and "coordination centers". Profit centers include territories used primarily for profit booking, with little production: Bermuda, the Cayman Islands, Puerto Rico, Jersey, Isle of Man, Gibraltar, Barbados, Mauritius, British Virgin Islands, Bahamas and Malta. Coordination centers include havens that are used to book profit but also for management and other coordination activities: Singapore, the Netherlands, Switzerland, Ireland, Luxembourg and Hong Kong. Over the 2015–2020 period, we find that all existing series—direct investment income, profit-type return, country-by-country data—paint a consistent picture .

First, the fraction of foreign profit booked in havens is broadly similar across sources, although a number of differences deserve to be noted. About 50% of the foreign profits of US multinationals appear to be booked in tax havens in recent years. The haven share is higher in direct investment income statistics (around 55%) than in profit-type return series (around 45%) with the corrected country-by-country series usually in between (Fig. A9A). For the reason discussed in Section A.1, direct investment income series can be seen as an upper bound while profit-type return series can be seen as conservative. Appendix Figure A11 reports a comparison across sources at the haven level. More profit is assigned to Bermuda in the country-by-country data than in profit-type return series, and vice-versa for Ireland. In direct investment income series, more profit is assigned to conduit countries (Luxembourg, Netherlands), due to the fact that in direct investment statistics, profits are allocated to the country with which the US parent has a direct link.

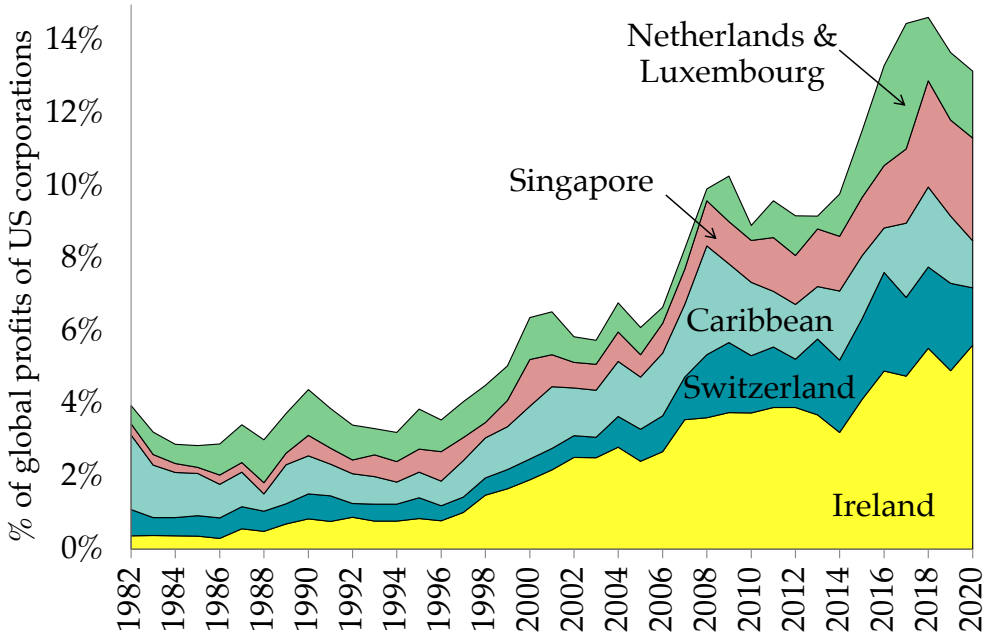
Second, and most importantly, in the years immediately following TCJA, the share of foreign profits booked in tax havens has remained flat at around 50%. No source suggests a significant immediate change in the haven share of foreign profits. Looking at country-level patterns, for profit centers the share of profit booked in Bermuda, Jersey, Isle of Man and Gibraltar increased, while it fell in the Cayman Islands. For coordination centers, Ireland and Singapore attracted a larger share of foreign profits consistently across sources, while Netherlands and Switzerland kept their share of profits constant or, depending on the source, lost part of it. Overall gains and losses at the haven-level broadly offset each other.

Third, the high concentration of foreign profits in tax havens contrasts with the dispersion of employment and tangible assets. Consistently across sources, only 4–9% of foreign employees and 18–23% of foreign tangible assets are located in tax havens (panels B and C of Figure 2), primarily in coordination centers such as Ireland, Singapore or the Netherlands. The shares of foreign employees and foreign tangible assets in tax havens are stable over the 2015–2019 period, suggesting no significant changes in patterns of tax competition for production factors.

Finally, we can combine the results from Section 3 on the share of profits booked abroad, with these results on the share of foreign profits booked in tax havens. For this computation, we use profit-type return series as our measure of the share of foreign profits booked in tax havens. Because profit-type returns series can be constructed back to 1982, we can show the long-run

evolution of the fraction of US firms' total profits booked in tax havens.[6] Figure 3 reports the results.

Figure 3: Profits Booked by US Corporations in Tax Havens



Note: This figure shows the ratio of pre-tax profits booked in tax havens to global pre-tax profits for all US corporations (whether they have foreign affiliates or not). At the numerator, haven profits are estimated using data from the BEA survey of the foreign operations of US multinationals, series "profit-type return." "Caribbean" includes Bermuda. At the denominator, global pre-tax profits include all domestic and foreign profits of US corporations, as reported in the US macroeconomic accounts; see Section B.1. Puerto Rico is excluded from both the numerator and denominator.

The series in this figure is constructed by multiplying the share of global profits made abroad (Figure 1a, line "All corporations (NIPA)") by the share of foreign profits booked in tax havens (Figure 2, line "profit-type return," removing Puerto Rico). For instance, in 2017, 32% of the total profits of US corporations (including firms with no foreign affiliates) were booked abroad, and 46% of the profit-type return of majority-owned affiliates was in tax havens. Therefore, 46% $\times$ 32% = close to 15% of the global profits of US firms were booked in tax havens in 2017, a historical peak. This statistic fell back to 13% in 2020, driven by the decline in the foreign share of profit. Overall, the share of total profit booked in havens slightly fell but remained at a historically high level after the Tax Cuts and Jobs Act. This share was less than 5% in the 1980s and 1990s.

[6]Due to the lack of long-run time series on profits booked in Puerto Rico, we have to exclude this territory from the list of havens considered in Figure 3. Including Puerto Rico would increase the haven share throughout, though more research is required to know by how much exactly back in time.

In sum, the Tax Cuts and Jobs Act was not followed by a major decline in the fraction of US firms' profits booked in tax havens. Once all publicly available sources are confronted and harmonized—so that profits are defined in the same way and any double counting is removed—these sources paint a consistent picture. There was a small decline the share of profits booked outside of the United States, largely driven by the repatriation of intellectual property to the United States by six large companies. In 2018–2020, US multinational corporations booked a similar share of their foreign profits in tax havens—around half—as in the years immediately preceding the reform. Combining these two findings implies a modest decline in the fraction of their total (US plus foreign) profits that US firms book in tax havens. These results suggest that additional policy efforts have the potential to further reduce profit shifting by US multinational companies.

5 Changes in Sensitivity of Profits to Tax Rates

Finally, we investigate using a standard regression framework whether the sensitivity of profits to tax rates differs between the periods before and after the TCJA.

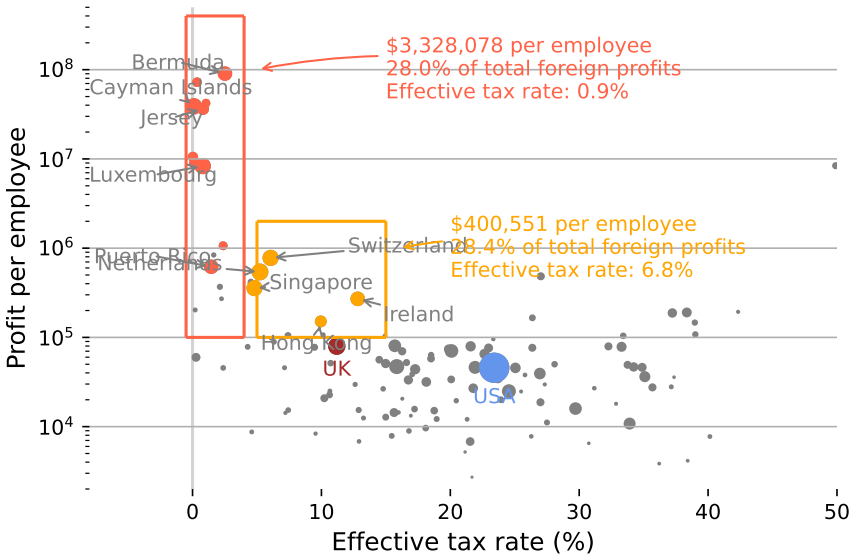
We begin with a basic empirical question: are high profits in tax havens associated with low effective tax rates (ETRs)? Using adjusted CBCR data for profit-making affiliates from 2017 to 2019, we find a strong negative correlation between profitability (measured as profit per employee) and ETRs. The most profitable jurisdictions—e.g., Bermuda and Cayman Islands—combine extreme profitability with near-zero tax rates (Figures 4a and 4b). In 2019, the top profit centers (accounting for 13.3% of total profits) recorded $2.2 million in profit per employee with an average ETR of 1.4%. Coordination centers (35.4% of profits) exhibited lower profitability ($470,000 per employee) and higher ETRs (8.3%).

These patterns are robust across datasets and align with findings in Cobham and Janský (2019), Tørsløv et al. (2022), and Garcia-Bernardo, Janský et al. (2021). Notably, no country combines high profitability and high ETRs, and only tax havens display both extremely high profitability and low ETRs.

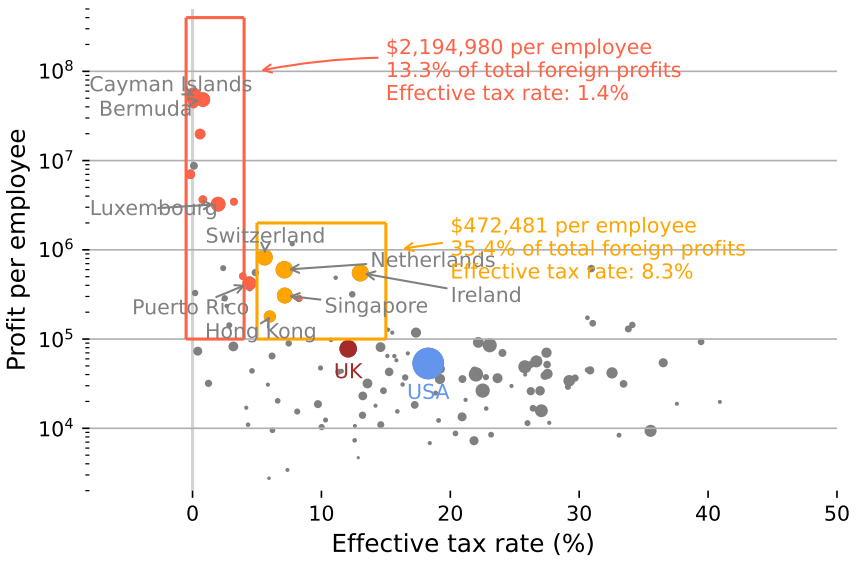
Next, we estimate the elasticity of reported profits with respect to tax rates using four established specifications. The regression-based approach was pioneered by Hines and Rice (1994), who used a linear as well as a quadratic specification. We also consider a specification with tax haven

Figure 4: Extreme profitability in tax havens

(a) Adjusted CBCR data, profit-making affiliates (2017)



(b) Adjusted CBCR data, profit-making affiliates (2019)



Notes: Profitability of affiliates is measured as profit per employee. Bubble size indicates the profits booked in the jurisdiction. Profit-centers are shown in red and coordination centers in orange. The average profit per employee, the share of total profits booked, and the average ETR is shown for the countries within the red and orange boxes. The United States is displayed in blue, and the United Kingdom is displayed in dark red. Only tax havens with at least $10 billion of profits booked are annotated. ETRs for countries not present in the profit-making affiliates tables is calculated using data from all affiliates.

dummies following Dowd et al. (2017) and a logarithmic specification as in Garcia-Bernardo and Janský (2024).

The linear and quadratic specifications are as follows:

$$\log(\pi_i) = \beta_0 + \beta_1 \log(K_i) + \beta_2 \log(L_i) + \beta_3(1-\tau_i) + \beta_\chi \chi + \epsilon, \tag{1}$$

$$\log(\pi_i) = \beta_0 + \beta_1 \log(K_i) + \beta_2 \log(L_i) + \beta_3(1-\tau_i) + \beta_4(1-\tau_i)^2 + \beta_\chi \chi + \epsilon, \tag{2}$$

where π_i represents profits booked in country i, including both real profit and profit shifted, and K_i and L_i are the capital and labour components of the Cobb-Douglas production function, usually operationalised with total tangible assets and wages. τ_i is the tax rate faced by the subsidiary which we proxy by ETRs, and χ are controls including e.g. GDP per capita and population.

We then estimate a haven-specific semi-elasticity by interacting tax rates with a tax haven dummy, following Dowd et al. (2017):

$$\log(\pi_i) = \beta_0 + \gamma_1 TH_i + \beta_1 \log(K_i) + \beta_2 \log(L_i) + \beta_3(1-\tau_i) + \gamma_2 TH_i(1-\tau_i) + \beta_\chi \chi + \epsilon, \tag{3}$$

Lastly, to account for extreme non-linearities at very low tax rates, we apply a logarithmic specification as in Garcia-Bernardo and Janský (2024):

$$\log(\pi_i) = \beta_0 + \beta_1 \log(K_i) + \beta_2 \log(L_i) + \beta_3(\tau_i) + \beta_4 \log(t + \tau_i) + \beta_\chi \chi + \epsilon. \tag{4}$$

where $t = 0.001$ avoids instability in elasticity estimates for jurisdictions with ETRs close to zero. The results of the regressions are highly robust to the choice of the offset Garcia-Bernardo and Janský (2024).

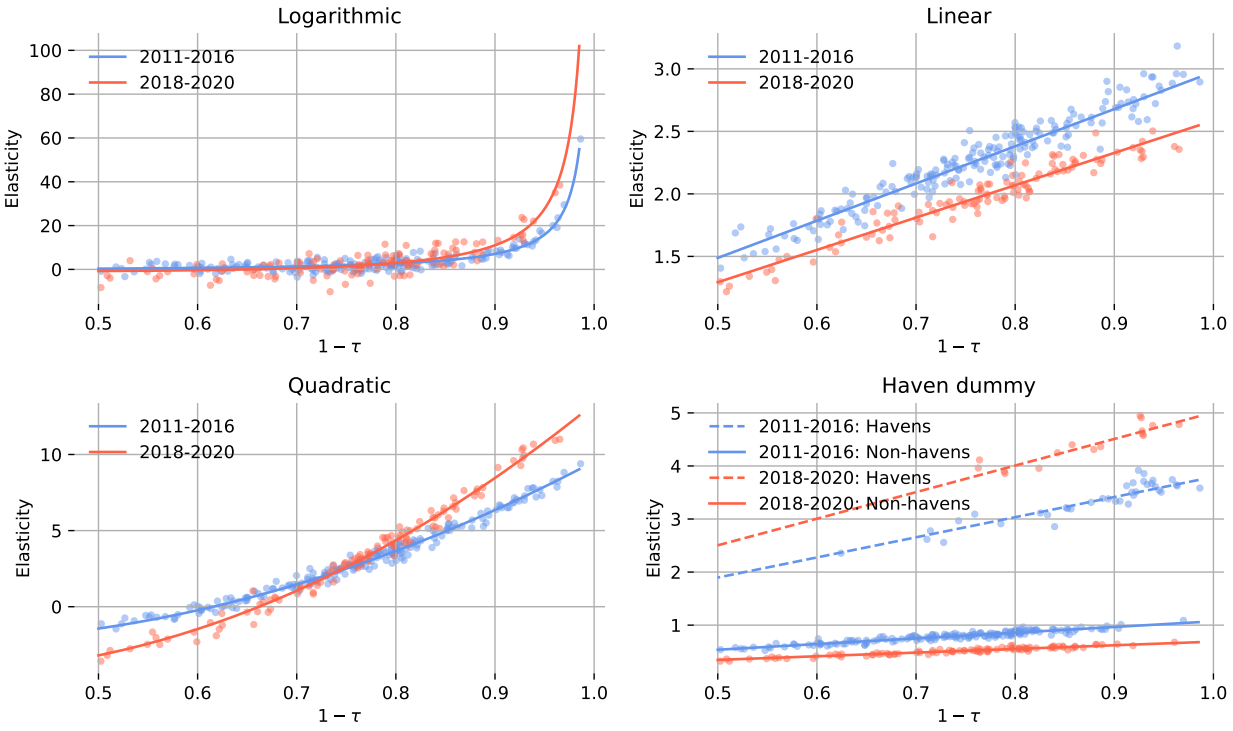
Using BEA data with year fixed effects, we estimate these four specifications for pre-TCJA (2011-2016) and post-TCJA (2018-2020) periods. The resulst are presented in Table A5 in the Appendix and visualized in Figure 5.

Across specifications, we find increased sensitivity of profits to tax havens in the post-TCJA period, especially at low tax rates typical of tax havens. Both quadratic and logarithmic specifica-

tions show that the relationship between profits and tax rates became more non-linear post-TCJA—multinationals are increasingly sensitive to extremely low tax rates. Similarly, the haven dummy specification shows that semi-elasticity rose in havens and declined in non-havens. Somewhat in contrast, the linear specification shows less sensitivity post-TCJA, but averaged across haven and non-haven counties.

Our results suggest that while the statutory US tax rate declined and the overall incentive to shift profits abroad may have weakened, this was offset by rising sensitivity of profits to tax rates—especially within tax havens. This suggests that the TCJA's anti-avoidance measures may not be sufficient to curb profit shifting. More stringent policy reforms, such as applying GILTI on a country-by-country or entity-level basis, rather than on an aggregate basis, may be needed to significantly reduce shifting to low-tax jurisdictions.

Figure 5: Changes in sensitivity of profits to tax rates



Notes: Estimated tax semi-elasticity from four specifications—linear, quadratic, haven dummy and logarithmic—using the BEA data for the periods before the TCJA (2011-2016) and after (2018-2020), with year fixed effects. The results are robust to the inclusion of 2017 (the year TCJA was enacted), as shown in Figure A15 in the Appendix.

6 Conclusion

Following the 2017 Tax Cut and Jobs Act, US multinational companies faced lower corporate tax rates and new provisions designed to curb profit shifting. To assess how companies adjusted the geographical allocation of their profits after the reform, we combine survey data, tax data, and firm financial statements. After harmonizing all publicly available sources, we find a consistent picture of the share of profits booked abroad by US multinationals and how much of it is booked in tax havens.

Specifically, the share of profits booked abroad fell by 1–5 percentage points, largely due to the repatriation of intellectual property to the United States. At the same time, the share of foreign profits booked in tax havens remained stable around 50% between 2015 and 2020. Taken together, these trends imply a modest decline in the fraction of total (domestic plus foreign) profits that US companies book in tax havens. While aggregate changes are small overall, we further show that some firms made substantial adjustments.

These findings suggest that further policy efforts may be needed to meaningfully reduce profit shifting by US multinationals. While the TCJA resulted in a modest reduction in the share of profits booked abroad, the persistently high share of foreign profits allocated to tax havens—around 50%—indicates that existing measures, such as the GILTI, may not be stringent enough to deter profit shifting substantially. Policymakers could consider enhancing the impact of these measures by applying GILTI on a country-by-country basis rather than in aggregate, as this would reduce opportunities for multinationals to offset high-tax and low-tax jurisdictions. Furthermore, international coordination, such as the OECD's global minimum tax, could play a pivotal role in reducing profit shifting incentives. Even if the United States does not fully adopt the global minimum tax in a near future, its implementation from 2024 onwards by many countries, including those in European Union, may nonetheless also curb profit shifting out of the United States.

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Online Appendix (Not for Publication)

Section A discusses data on the profits of US multinational companies and Section B discusses the methodology in detail. Section C details the construction of domestic and foreign profit in the US National Income and Product Accounts and International Economic Accounts. Section D details the correction for double-counting in the country-by-country data. Section E provides additional details on the firm-level analysis in Compustat. Appendix Figures and Tables are in Section F and Section G respectively.

A Data on the Profits of US Multinational Companies

Three main data sources exist to study the activities of US multinational companies: surveys conducted by the Bureau of Economic Analysis; company financial statement collected in Compustat; and tax data collected by the Internal Revenue Service. This Section presents these sources and explains how the various profit measures in these data relate to each other. Understanding the specificity of each source and their relationship is a necessary step before we can construct harmonized statistics that maximize comparability across sources, which we do in Appendix B.

A.1 BEA Survey Data

The Bureau of Economic Analysis (BEA) conducts mandatory quarterly, annual, and benchmark surveys of the foreign operations of US multinational companies. These surveys are the raw source used by BEA to produce its international economic accounts, including balance of payments statistics and activities of multinational enterprise statistics (Bureau of Economic Analysis, 2021).

Quarterly surveys provide data to estimate the size and location of the profits made by foreign companies (typically affiliates of US multinationals) in which a US investor owns a more than 10% stake. These profits, net of foreign income taxes and pro-rated by the ownership stake of the US investor, are published in the US balance of payments as direct investment equity income received by the United States. Annual surveys provide additional statistics on the activities of US multinationals, but are available with some lag. Benchmark surveys are conducted every five years. The most recent annual survey is for the year 2019, a benchmark survey year.

In addition to direct investment income, tabulations of the annual surveys report a profit measure called "profit-type return" by BEA. In contrast to direct investment income, profit-type return is not pro-rated by the ownership stake of the parent (all the profits of majority-owned affiliates are included, while profits of minority-owned affiliates are excluded) and is gross of foreign income taxes. Once foreign taxes are removed, profit-type return and direct investment equity income line up well on aggregate (see Appendix B below). Direct investment income and profit-type return, however, differ in how profits are assigned across countries, as detailed in Wright and Zucman (2018). Following international guidelines for balance of payments accounting, in direct investment statistics, income is assigned to the countries with which the US parents have direct links. In profit-type return series, profits are assigned to the countries where operating income is earned. For example, if a US parent owns an operating affiliate in Germany through a holding company in the Netherlands, profits made by the German affiliate are recorded as direct investment income earned in the Netherlands, but as profit-type return earned in Germany. Annual surveys also report another profit measure, "net income," which double-counts income earned through chains of affiliates. We do not use net income in this research. Neither direct investment income nor profit-type return double-counts foreign income.[7] Adjusted pre-tax income and profit-type return are very similar in level and trend similarly around the Tax Cuts and Jobs Act. We do not use adjusted-PTI in this research. The key difference is that adjusted-PTI does not subtract capital gains, while profit-type return does (because capital gains do not contribute to value-added and income in economic statistics). Once capital gains are subtracted from "adjusted-PTI," this statistic is equal to profit-type return for virtually all countries $\times$ year. We show the similarity between the series in Fig. A5.

In the BEA survey, US firms are generally required to report data as they would for stockholder's reports, not as they would for tax purposes. Thus neither direct investment income nor profit-type return coincides with where income is taxed. Profit-type return can understate income booked for tax purposes in havens (especially zero-tax havens), because of schemes that shift taxable but not

[7]Using the BEA survey, Blouin and Robinson (2020) propose to use "adjusted pre-tax income," which they compute as net income, minus income from equity investments, plus foreign income taxes paid. This is very close to profit-type return, which is computed by BEA since 1994 as net income, minus income from equity investments, plus foreign income taxes paid, minus capital gains, plus an inventory valuation adjustment. Since our headline series of haven income are based on profit-type return, we do not use "adjusted pre-tax income." Previous research that used profit-type return to study the location of US multinationals' profits includes Wright and Zucman (2018) and Saez and Zucman (2019).

accounting income Bilicka (2019), such as hybrid structures[8] and hybrid dividends.[9] By contrast, direct investment income is likely to overstate haven income, because income flowing to holding companies with which US parents have direct links may have been taxed in the countries where operating affiliates are located.

A.2 Corporate Financial Statements

The second main data source to study US multinationals is companies' public financial statements (annual 10-K filings to the Securities and Exchange Commission), collected in S&P's Compustat North America. Compustat covers listed corporations; it excludes private companies which do not have to publicly disclose their accounts. The vast majority of listed firms report a breakdown of their global profits into US vs. non-US. However, profits are not broken down by country.

A.3 Country-By-Country Tax Data

The third main data source is the country-by-country data (tabulations of IRS form 8975) published by the Internal Revenue Service. These data include information on all US-headquartered multinationals with annual revenue over $850 million; see, e.g., Clausing (2020a) and Garcia-Bernardo, Janský et al. (2021) for a presentation of these data. In 2016 reporting was voluntary and the data was thus incomplete; since 2017 reporting is compulsory. We do not use the 2016 data in our analysis.[10]

An advantage of country-by-country statistics is that these data may more closely reflect how US firms allocate profits for tax purposes than other data sources. Multinationals must allocate profits across "tax jurisdictions;" the IRS instructs that "a business entity is generally considered a resident in a tax jurisdiction if, under the laws of that tax jurisdiction, the business entity is liable for

[8] A case in point is Google Alphabet: Based on public records collected in Orbis we know that Google Holdings, an intellectual property-holding company, made $13.7 billion in operating income in 2019. Since Google Holdings is incorporated in Ireland and files its accounts with the Irish companies registry, these profits are likely assigned to Ireland in the profit-type return series. However, Google Holdings was not taxable in Ireland but in Bermuda (where the corporate tax rate is zero). Public filings show that Google Holdings paid no tax in Ireland.

[9] For example, an affiliate in Luxembourg may pay income considered as interest in Luxembourg to a Swiss affiliate. If this income is treated as dividend in Switzerland, it is excluded from profit-type return in both countries, thus causing an under-estimation of profit-type return in tax havens.

[10] Another tax dataset to study profit shifting comes from IRS form 5471, "US Corporations and Their Controlled Foreign Corporations". Profits can be computed by subtracting "Dividends received from foreign corporations or partnerships controlled by US corporation filing return" from "Current earnings and profits (less deficit)". Tabulations of forms 5471 are only released every two years and at the time of writing the most recent release was for the the year 2016; therefore we do not use controlled foreign corporations data in this paper.

tax therein." Thus, for instance, profits of entities incorporated in Ireland but taxable in Bermuda (see footnote 8 for the case of Google), should logically be assigned to Bermuda (and indeed, as shown in Section 4 below, there is more profit assigned to Bermuda in the country-by-country data than in the BEA survey, and vice-versa for Ireland). Another advantage is that country-by-country statistics report information on Puerto Rico, a tax jurisdiction separate from the United States. Both direct investment and profit-type return statistics exclude profits booked in Puerto Rico, which is not treated as a foreign jurisdiction in the BEA surveys. Last, country-by-country statistics are provided separately for profit-making affiliates and all affiliates (including those making losses). Excluding loss-making affiliates makes it possible to compute meaningful effective tax rates at the country level, which are otherwise upward biased.

The main drawback of existing country-by-country data is that they can double count profits. Until 2020, OECD guidelines did not explicitly instruct companies to remove intra-group dividends from profits. When intra-group dividends are included, profits can be counted multiple times when they flow through chains of holding companies. We address this issue in Section B.2 below.

B Methodology: Construction of Domestic, Foreign, and Haven Profit

Our main macroeconomic statistics of interest are (i) the share of US corporations' profits made abroad, and (ii) the share of foreign profits booked in tax havens. This Section presents the methodology used to construct these series.

B.1 Aggregate Domestic and Foreign Profits

We first estimate aggregate domestic and foreign profits. Our goal is to construct aggregate series that maximize comparability across sources (e.g., based on the same definition of profit); that are comprehensive (i.e., covering the largest sample of firms possible); and that are consistent (e.g., without double counting and with a consistent treatment of taxes and depreciation, so that meaningful ratios of foreign to total profits can be constructed).

Macroeconomic accounts (all corporations). We start by building the most comprehensive aggregates possible, namely total domestic and foreign profits for all US corporations, using BEA's National Income and Product Accounts (NIPA) and International Economic Accounts.

Total domestic profits are computed as NIPA corporate profits (NIPA Table 1.12 line 13, which includes both US and foreign profit), minus Federal Reserve profits, minus portfolio dividends received from the rest of the world net of portfolio dividends paid, minus direct investment income equity income received with current-cost adjustment.[11] Total foreign profits are computed as direct investment equity income received without current cost adjustment, divided by one minus the foreign effective income tax rate of majority-owned affiliates (computing using the BEA survey), plus the current-cost adjustment. We call this measure of foreign profit *pre-tax direct investment equity income*. This is the most comprehensive measure of the foreign earnings of US companies, and the one that maximizes consistency with NIPA corporate profits.[12] Both domestic and foreign profits constructed with this procedure are on a pre-tax basis (i.e., gross of both foreign and US income taxes) and based on the same measure of economic depreciation.

BEA survey (multinationals). Next, we construct aggregate domestic and foreign profits for multinational companies in the BEA survey. US profits are computed as profit-type return of parents. Foreign profits are computed as profit-type return of majority-owned affiliates. Both domestic and foreign profit so defined are net of book (not economic) depreciation. Before 1994, profit-type return (for both parents and foreign affiliates) is computed as net income plus foreign income taxes paid minus income from equity investment minus capital gains.

Compustat (listed firms). We compute total US and foreign profits for US listed firms in Compustat. Global profits are variable *pi* and foreign profits variable *pifo*. All listed firms report their global profits. Since 2010 we observe foreign profits for about 95% of listed firms weighted by global profit.

[11]The current-cost adjustment converts book depreciation to economic depreciation (Bureau of Economic Analysis, 2021, p. 122), making direct investment income comparable to NIPA corporate profits, which are net of economic depreciation.

[12]Pre-tax direct investment equity income is more comprehensive than profit-type return plus foreign taxes paid, since profit-type return is only published for majority-owned affiliates, while direct investment equity income includes the profit of minority-owned affiliates apportioned by the ownership stake of the US parent. We use pre-tax direct investment equity income primarily to compute aggregates, not to study the country-by-country location of income; when allocating foreign profits across countries, we favor profit-type return (see Section B.2 below).

Country-by-country data (multinationals). Finally, we compute total domestic and total foreign profits in the country-by-country data. These data require particular care, due to the double-counting issue noted above. To address it, we use Compustat and other sources to estimate total domestic and foreign profits which should in theory (given reporting threshold requirements) be reported if there was no double-counting, and re-scale the country-by-country data so that they match these totals, building on Horst and Curatolo (2020). Specifically, in Compustat we compute aggregate domestic and foreign profits for all US-headquartered listed multinational companies with revenues over $850 million, and estimate the foreign vs. domestic split for the approximately 120 listed companies with missing *pifo*. We also estimate profit for about 150 private companies subject to the country-by-country reporting requirements but not covered by Compustat. Appendix D provides complete details. Our results suggest that total profits in country-by-country data were over-estimated by 48% in 2017, 72% in 2018 (a year of abnormally large intragroup dividend flows in response to the Tax Cuts and Jobs Act) and 47% in 2019. We also show that over half of this double counting involves domestic profit. We correct the country-by-country data at the country level (double-counted foreign income is subtracted from tax havens, where intermediate holding companies are located) and all our analyses of the country-by-country data uses these corrected series.

Consistency across sources. Table A1 compares the amount of foreign profits earned by US multinationals across sources. All series reported in this table are on a pre-tax basis and based on book depreciation. We can see that the absolute amounts line up relatively well. In 2019, there is $656 billion in pre-tax direct investment equity income, $523 billion in profit-type return for majority-owned affiliates, $603 billion in foreign profit in the corrected country-by-country data, and $560 in foreign profit in Compustat.

The differences in aggregate totals reflect the specificity of each source (in particular the sample of firms covered), as discussed in Section **??**. Profit-type return is slightly lower than direct investment income because of the exclusion of minority-owned affiliates. The ratio of profit-type return to direct investment income is stable over time, as shown by Appendix Figure A4a. Pre-tax foreign profit in Compustat is slightly lower than pre-tax direct investment income because of the exclusion of private firms and the fact that not all listed firms report foreign profits (see last

column of Table A1). Foreign profit in Compustat averages 87% of pre-tax direct investment equity income since 2004 with a ratio broadly stable over time (Appendix Figure A4b). Compustat profit lines up very well with profit-type return. The corrected country-by-country series lie in between profit-type return and direct investment income.

Table A1: Aggregate Foreign Pre-Tax Profits

year	DI equity income	Profit-type return	Profit-type return + CG	CBCR	CFC	Compustat	Compustat (% info)
1990						68.8	70.6
1991						52.6	63.5
1992						47.8	69.4
1993						46.9	68.1
1994						72.4	73.0
1995						93.6	69.9
1996						104.9	71.2
1997						108.8	67.5
1998						89.1	62.5
1999						119.3	63.0
2000						149.3	68.9
2001						122.1	74.1
2002						134.4	70.0
2003						178.6	74.9
2004	311.0	258.8	265.8			285.3	81.1
2005	377.9	324.9	341.7			334.4	84.8
2006	422.5	365.2	382.6			406.1	80.3
2007	481.3	419.6	426.2			474.2	85.8
2008	540.2	449.2	397.2			424.5	93.5
2009	460.5	398.7	410.4			374.5	94.5
2010	557.2	460.2	496.3			481.3	89.0
2011	621.9	561.1	573.4			553.0	94.1
2012	601.3	543.4	546.6		670.3	528.8	93.5
2013	597.2	511.7	520.9			526.0	90.7
2014	598.2	554.2	582.4		647.6	520.9	94.0
2015	529.9	478.2	438.0			433.4	95.4
2016	528.5	434.1	428.5		705.6	447.7	94.7
2017	637.4	538.8	601.8	596.0		545.8	94.8
2018	669.9	556.2	613.2	658.8		614.1	97.3
2019	641.9	510.8	559.5	602.5		559.7	95.7
2020	563.0	439.4	479.4			414.0	99.2

Notes: This table shows the aggregate amount of foreign pre-tax profits earned by US multinational companies in the different data sources in this research, in billions of current US$. Direct investment equity income is direct investment equity income without current-cost adjustment, gross of foreign income taxes (see text). Profit-type return is profit-type return of majority-owned affiliates as reported in the BEA survey. "CBCR" refers to country-by-country profits corrected for double counting following the procedure described in the text and detailed in Appendix D. The column "Compustat (% info)" shows the share of total profits (Compustat variable *pi*) made by companies with information available on foreign profits (Compustat variable *pifo*).

B.2 Share or Foreign Profits Booked in Tax Havens

Our second statistic of interest is the share of foreign profits booked in tax havens. We compute this share for US multinational companies using the BEA survey data and the corrected country-by-country data. Our objective is to capture the location of operating or taxable income.

In the BEA survey, our preferred measure of income for allocating foreign profit to specific jurisdiction is profit-type return (not direct investment income). Following Zucman (2014), we classify Bermuda, Ireland, Luxembourg, Netherlands, Singapore, Switzerland, and UK Caribbean as tax havens. Our measure of haven profit is conservative, because it excludes havens which cannot be separately identified in the BEA survey data (e.g., Puerto Rico, Jersey, Malta, Mauritius). We also report series of haven profits using direct investment income (which we view as an upper bound for the reasons noted in Section A.1), using the same list of tax havens. In the country-by-country data corrected for double counting, the larger country coverage allow us to consider a slightly more extensive list of havens: in addition to those considered above, our list includes Barbados, Gibraltar, Hong Kong, Isle of Man, Jersey, Malta, and Mauritius.

C Domestic and Foreign Profits in the National Accounts

To compute the fraction of US firms' profits that are made outside of the United States, we construct a consistent measure of US and foreign profits in the US national income and product accounts (NIPA) and International Economic Accounts.

We compute *foreign pre-tax profits of US corporations* in three steps:

- We start with direct investment equity income received without current cost adjustment, taken from BEA's International Economic Accounts (e.g., $420B in 2016).

- Direct investment equity income is net of foreign income taxes paid. We convert it to a pre-tax basis by dividing direct investment equity income by 1 minus the foreign effective income tax rate of the majority-owned affiliates of US multinationals. This effective rate is computed in the BEA survey as foreign income taxes paid by majority-owned affiliates divided by profit-type return of majority-owned affiliates. In 2016, the effective tax rate is $87B/$434B

= 20.0%. Thus on a pre-tax basis, direct investment equity income is \$420B/0.8 = \$525B in 2016.

- We then add BEA's current-cost adjustment. This adjustment converts book depreciation to economic depreciation (see Bureau of Economic Analysis, 2021, p. 122), making foreign profit comparable to domestic NIPA profit.[13] In 2016, the current-cost adjustment is \$21B; thus total pre-tax foreign profits that year add up to \$525B + \$21B = \$546B.

We compute *domestic pre-tax profits of US corporations* in two steps.

- We start with NIPA corporate profits as included in national income (e.g., \$2,038B in 2016), which includes foreign income (net of foreign income taxes). From this we subtract Federal Reserve profits (\$93B in 2016) and portfolio dividends received from the rest of the world net of portfolio dividends paid (\$218B - \$139B = \$79B). The result (\$1,866 in 2016) is the global income of US-headquartered corporations.

- We then remove the foreign profits included in NIPA corporate profits, i.e., direct investment equity income received with current-cost adjustment (\$441B in 2016; cf. above). The result (e.g., \$1,425B in 2016) is the domestic income of US-headquartered corporations.

From there we compute the fraction of US corporations' profits booked abroad as foreign pre-tax profits / (foreign + domestic pre-tax profits); e.g., in 2016 546B/(546B + 1425B) = 28% (series reported in Figure 1a, "All corporations (NIPA)").

D Correction of Country-by-Country Data

D.1 Correction of Double-Counting in the Country-by-Country Data

The country-by-country data double-count some profits as a number of companies include as profit tax-exempt dividends flowing through subsidiaries. When intra-group dividends are included,

[13] In series without current-cost adjustments (such as profit-type return), depreciation and depletion are based on charges as reported in accounting statements (called "consumption capital allowance" by BEA). In series with current-cost adjustments, depreciation is computed using depreciation rates used for structures and equipment to reflect economic depreciation (called "consumption of fixed capital" by BEA); depletion is not subtracted because it is not a production cost in the System of National Accounts (Bureau of Economic Analysis, 2021, paragraph 13.14). Series without current-cost adjustments are more comparable to financial profits (as reported in, e.g., Compustat), while series with current-cost adjustments are comparable to national account statistics (such as corporate profits as reported in the NIPAs). The current-cost adjustment is computed for all foreign affiliates globally by BEA, but not at the country or industry level.

profits can be counted multiple times as they flow through chains of holding companies. This double counting can occur in the data for the period that we use (2017-2019), because the OECD reporting guidelines were changed only in 2020 to explicitly instruct companies to remove intra-group dividends from profits. At the moment, without other information such as firm-level CBCR data, it is not possible to learn more about why the double counting is happening, e.g. whether it is spread across companies or concentrated within companies that might face incentives that encourage companies to double count profits in their CBCR.

To correct the country-by-country data for double-counting of profits, we develop a methodology to eliminate double counting from these data, building on Horst and Curatolo (2020). We also reconcile the data with the Bureau of Economic Analysis surveys of the activities of US multinational enterprises.

As in Horst and Curatolo (2020), we use Compustat data to estimate the theoretical profits which should be reported in the CBCR data. We extract information through Wharton Research Data Services (WRDS) on foreign profits (pifo), foreign taxes (txfo), total profits (pi) and total taxes (txc). We also collect data on total assets (at), intangible assets (intan), employees (emp) and total sales (revt). Our cleaning procedure consists of four steps: First, we maintain observations using the industrial reporting format (indfmt=="INDL") whenever possible. Second, we retain only US-headquartered multinational companies (loc=="USA"), which reduces the sample to 7,789, 7,821, and 7,651 companies for 2017, 2018 and 2019. Third, we keep companies with revenues over $850 million, which reduce the sample to 1,741, 1,756, and 1,737 companies. For comparison, the CBCR samples include 1,575, 1,641 and 1,698 companies in 2017, 2018 and 2019 and may thus be considered to represent complete coverage for this purpose. Fourth, we drop companies which lack information on foreign profits or foreign taxes, which reduces the sample to 1,444, 1,468, and 1,443 companies. The total profit in 2017 for the sample of 1,444 companies is $1,342 bn (Table A2, columns B–C) and of this sum, $551 bn corresponds to foreign profits, $503 bn to domestic profits, and a total of $289 bn is unknown.

To estimate the theoretical total profits, we first estimate the foreign and domestic profits of the companies with missing data—i.e, approximately 120 in 2017 and bringing the sample size from approximately 1,330 companies to 1,450 companies. To do so, we model the logarithm of foreign profits using the logarithm of assets, revenue, intangibles, number of employees and foreign tax

accrued using the data (running a regression for the companies with non-missing foreign profits). The model estimates that the companies with missing information in 2017 have $248 bn of domestic profits (out of the $293 bn which are unknown) (Table A2, columns G–H). Second, we estimate the financial information of companies missing in the sample—i.e, bringing the sample size from approximately 1,450 companies to the approximately 1,600 companies reporting CBCR. Since those companies are private companies, they are expected to be smaller than publicly listed companies. We assign to these missing companies 20% of the average profits of non-missing observations. The profits of all companies reporting CBCR are estimated at $1,361 bn in 2017, $1,514 bn in 2018 and $1,513 bn in 2019 (Table A2, column I). Given that $1,818 bn, $2,406 bn and $2,064 bn are reported to CBCR, excluding stateless entities, this implies a double-counting of 34%, 59% and 36% respectively (Table A2, column K). Double-counting primarily takes place in the United States. Splitting this into domestic and foreign components, we estimate domestic double-counting at 54%, 74% and 42% in 2017, 2018 and 2019 ($415 bn, $632 bn and $385 bn) and foreign double-counting at 7%, 39%, and 28% ($42 bn, $260 bn, and $166 bn) (Table A2, columns K and M). The extent of foreign double-counting is higher when stateless entities are included (Table A2, columns J and L). There does not seem to be a clear trend over the years, such as less double counting as companies learn to report CBCR correctly over time.

In addition, we present three robustness checks. The first excludes the imputation of missing financial information. As in our benchmark method, we assume that the foreign profits of all companies which paid zero foreign tax are zero. This increases the sample size from around 1,000 to around 1,330 companies. As in our benchmark method, the second step assumes that missing firms have the same average profits as non-missing firms. The second robustness test begins with the sample with non-zero foreign profits and assumes that the average profit of all missing observations is 20% of the average profit of non-missing observations. This value is calculated using information on listed vs non-listed companies in Orbis with a revenue over $850 million. The third robustness test adjusts information on profits based on information on employees and sales in CBCR data, which are not subject to double-counting. All methods provide similar estimates of double counting.

Finally, we move past the aggregate level and correct for double-counting in CBCR data at country level. We remove double-counting proportionally to the profits reported in the CBCR

data with profit-making entities, since profits (potentially including dividends) offset by losses are still reflected in that data. Since it is unlikely that profits are double-counted in countries not used as conduits or tax havens, we remove all double-counting from all tax havens with two exceptions: the United Kingdom and Ireland. While we do not classify the United Kingdom as a tax haven, it is often the location of corporate holdings and serves as a conduit. We do not remove profits from Ireland since the effective tax rate is 12% (similar to the statutory tax rate) and the Irish profits in CBCR data are much lower than those of other sources—which could point to a reporting of profits attributable to double Irish structures in other jurisdictions (e.g. Bermuda or stateless entities).

D.2 Comparison and Reconciliation with Other Sources

In 2017 we estimate foreign profits in CBCR at $596 bn, comparable to the $570–669 bn found in other datasets. In 2018 we estimate foreign profits at $658 bn, comparable to the $580–694 bn found in the other datasets. In 2019 we estimate foreign profits at $602 bn, comparable to the $547–671 bn found in the other datasets. The total profits are also comparable to those of Compustat and Orbis, both of which exhibit smaller sample sizes.

The CBCR data at country level is highly correlated with profit-type return (BEA) series (Figure A11). Among the countries featured in both datasets, CBCR and profit-type return show a stronger correlation (Kendall rank 0.77-0.78), although BEA data show lower profits for the Netherlands, Bermuda, Luxembourg and the UK Caribbean. Conversely, the direct investment series (BoP) show a weaker correlation (Kendall rank 0.74–0.76), especially in countries reporting less than $20 bn in profits.

E Changes in Profit Shifting at the Firm Level

We identify listed firms that engaged in changes in profit shifting behavior after the TCJA by combining quantitative and qualitative evidence obtained from firms' annual reports. We restrict our analysis to firms that had over $10bn revenue and remained profitable over the period 2017-2020. Using data from Compustat, we first find corporations that experience a persistent 20 percentage point drop in their foreign share of profits on a given year after the reform, when compared to the previous 3-year average. Among those firms, we isolate the ones for which we

think the drop could be caused by profit shifting. Concretely, we look at drops that are persistent and happen while total profits do not experience sharp changes. Most often, this implies that we see clear opposite trends in the trajectories of domestic and foreign profits, with a rise in profits booked in the US and a symmetric fall in profits booked abroad.

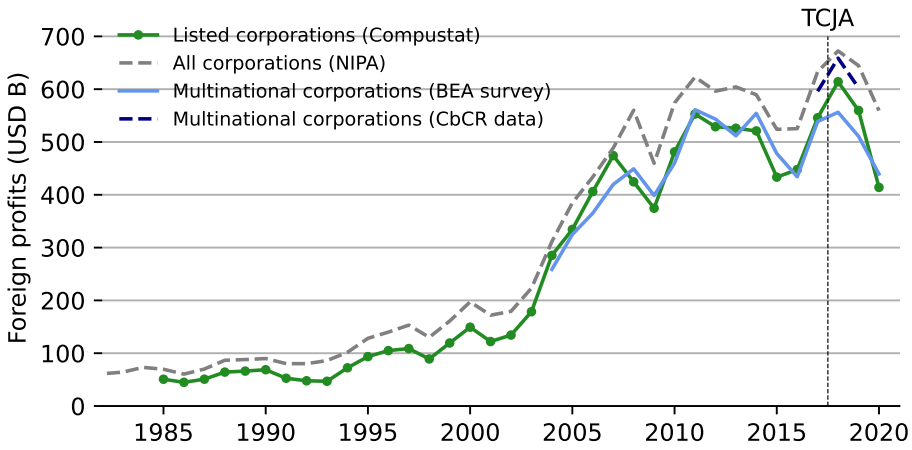
We then search the firms' annual reports (10-K SEC fillings) for any mention of a change in profit shifting behavior. Most often this implies searching for intra-group transfers of intangible assets such as patents, trademarks, copyrights, and other intellectual property. In one case we find a change in intra-group lending practices. We conclude that firms have changed their profit shifting behavior after the TCJA if: (1) their annual reports explicitly mention changes in profit shifting behavior; and/or (2) their domestic and foreign profits move symmetrically (see Table A4 for case by case details and Table A8 for an example of domestic and foreign profits moving symmetrically).

We list the firms we suspect have changed their profit shifting practices but do not satisfy the above criteria separately. We exclude from this subgroup all firms for which we have strong suspicions that the drops in the foreign share of profits that we observe were not due to changes in profit shifting.

We repeat the exercise looking at firms that experienced a drop of 10 percentage points in their foreign share and do not find any additional firms having clearly changed their profit shifting behavior.

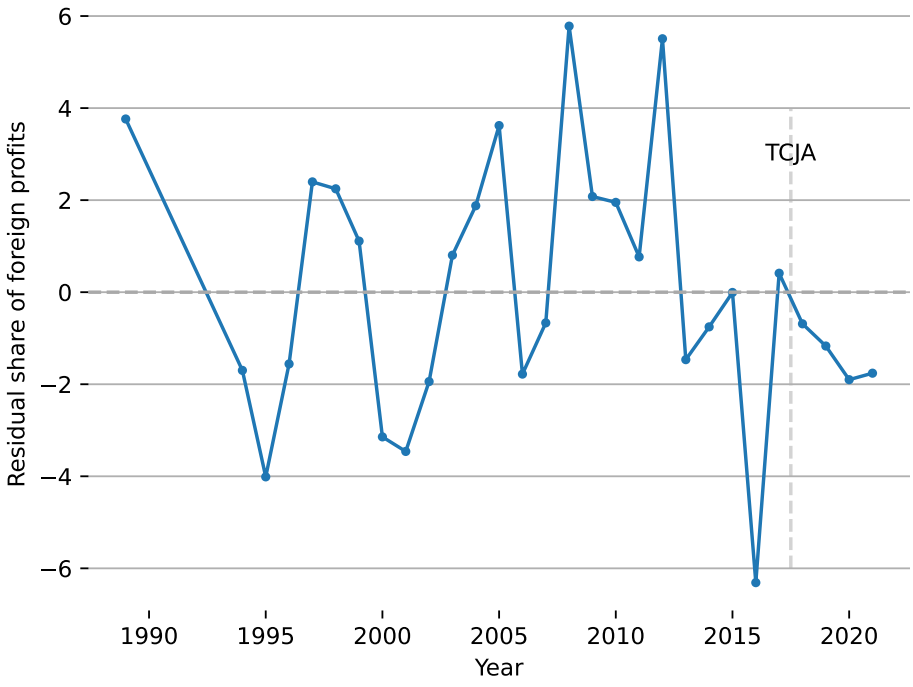
F Appendix Figures

Figure A1: Foreign Profits in USD



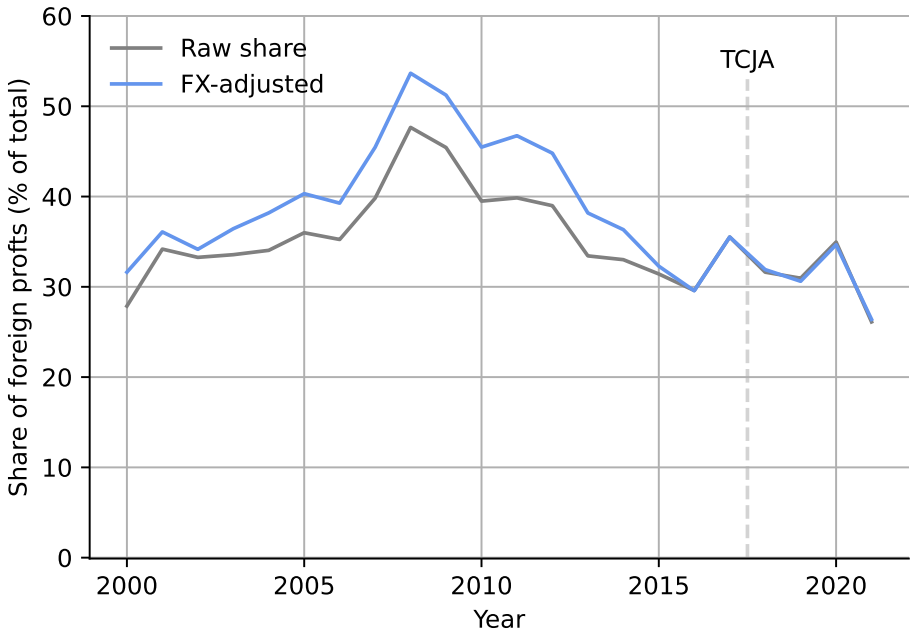
Note: Pre-tax profits booked outside of the United States for all corporations (using National Income and Product Account data), multinational corporations (using the BEA survey and country-by-country data), and listed corporations (using Compustat). See text for computation of foreign profits in each source. In Compustat, the sample includes all firms headquartered in the United States with non-missing *pifo* and profits are winsorized at the 99th and 1th percentile.

Figure A2: Foreign Share of Profits of US Firms, adjusted for differences in business-cycle



Note: It shows the residual ratio of pre-tax profits booked outside of the United States to total (domestic plus foreign) pre-tax profits for multinational corporations using the BEA survey. See text for computation of foreign and domestic profits. To adjust for cyclical fluctuations, we regress the raw foreign profit share on foreign GDP growth, U.S. GDP growth, and changes in the U.S. price index. The adjusted series corresponds to the residual component, which removes variation in profit shares mechanically explained by differences in business-cycle conditions or inflationary dynamics. This isolates the underlying structural evolution of the foreign share of U.S. multinational profits.

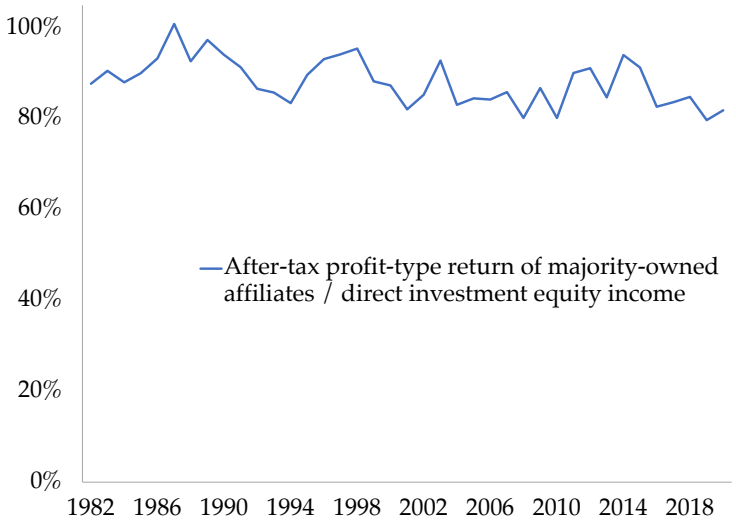
Figure A3: Foreign Share of Profits of US Firms, currency adjusted



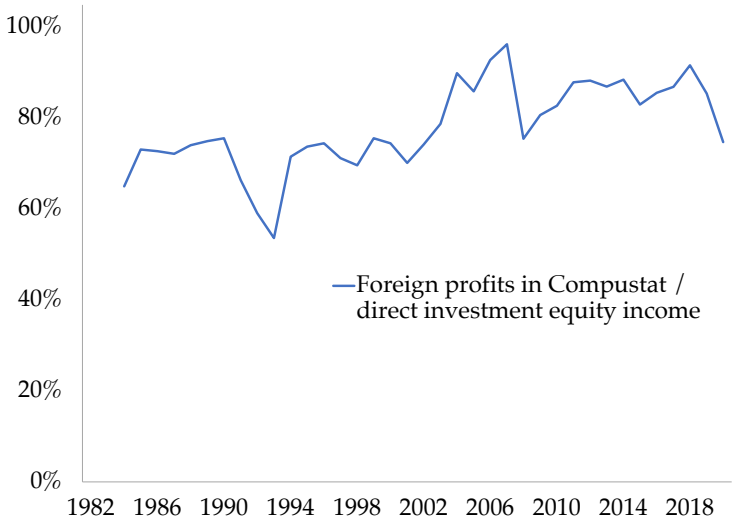
Note: It shows the ratio of pre-tax profits booked outside of the United States to total (domestic plus foreign) pre-tax profits for multinational corporations using the BEA survey. See text for computation of foreign and domestic profits. To account for exchange rate fluctuations, we adjust foreign profits using Nominal Exchange Rate (NER) by country. We start the series at year 2000 to address missing exchange rate values in some countries and distorsions due to hyperinflation in several countries in the 1980s and 1990s (e.g., Argentina or Peru). We normalize each country's NER by its 2017 level and scale reported profits accordingly. This removes mechanical changes in profit shares caused by currency appreciation or depreciation relative to the U.S. dollar.

Figure A4: Comparison of foreign profit measures

(a) Profit-type return vs. Direct investment

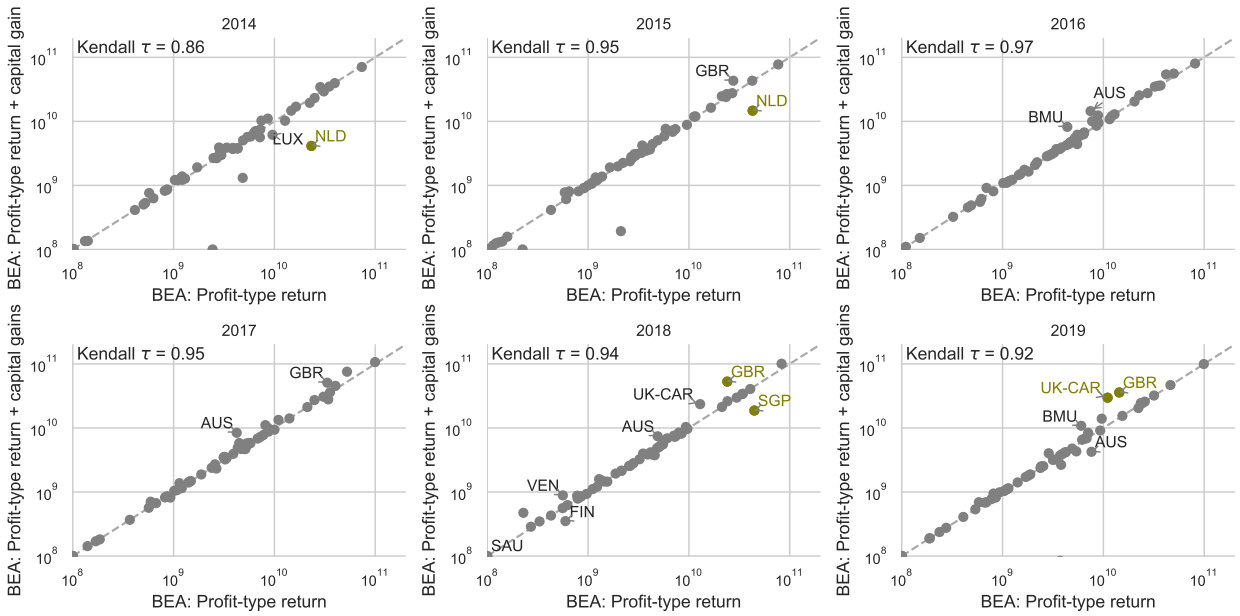


(b) Compustat vs. Direct investment



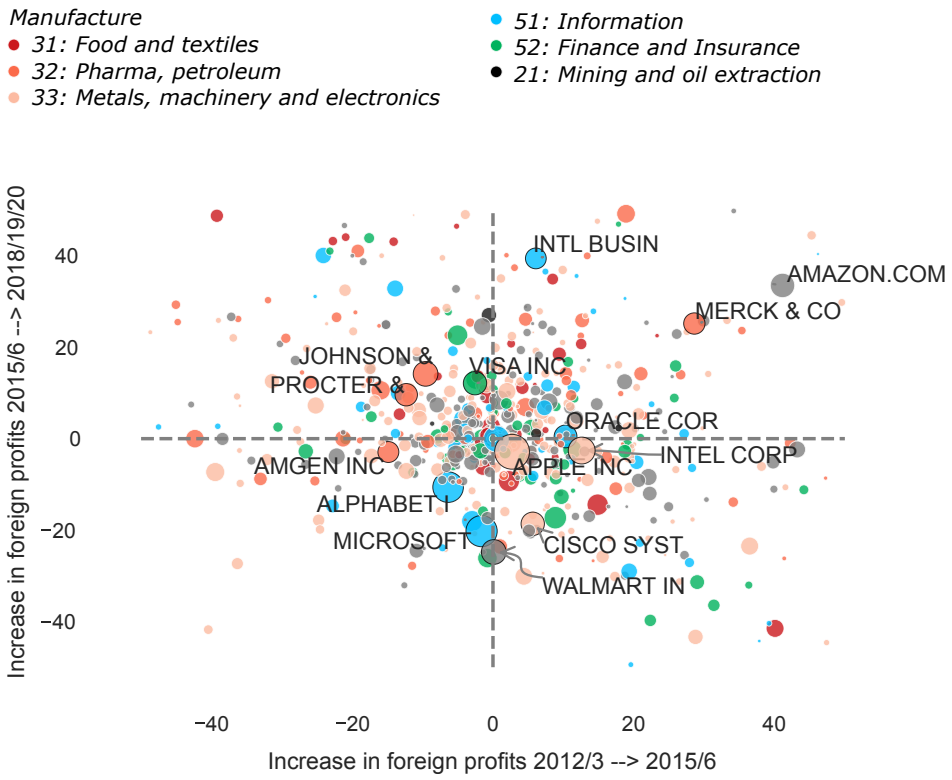
Notes: Panel A plots the ratio of after-tax profit-type return of the majority-owned affiliates of US multinational companies (defined as profit-type return minus foreign corporate income taxes paid), to direct investment equity income earned by the United States. The ratio is stable over time and slightly below 100%, as the numerator excludes the profits of minority-owned affiliates. Panel B plots the ratio of the foreign pre-tax profits of US listed companies as recorded in Compustat, to pre-tax direct investment income received by the United States, from the BEA international economic accounts. Pre-tax direct investment equity income is direct investment equity income without current-cost adjustment, divided by 1 minus the foreign income tax rate of the majority-owned affiliates of US multinational companies. The ratio is less than 100% because of the exclusion of private companies in Compustat.

Figure A5: The effect of capital gains in the profit-type return serires



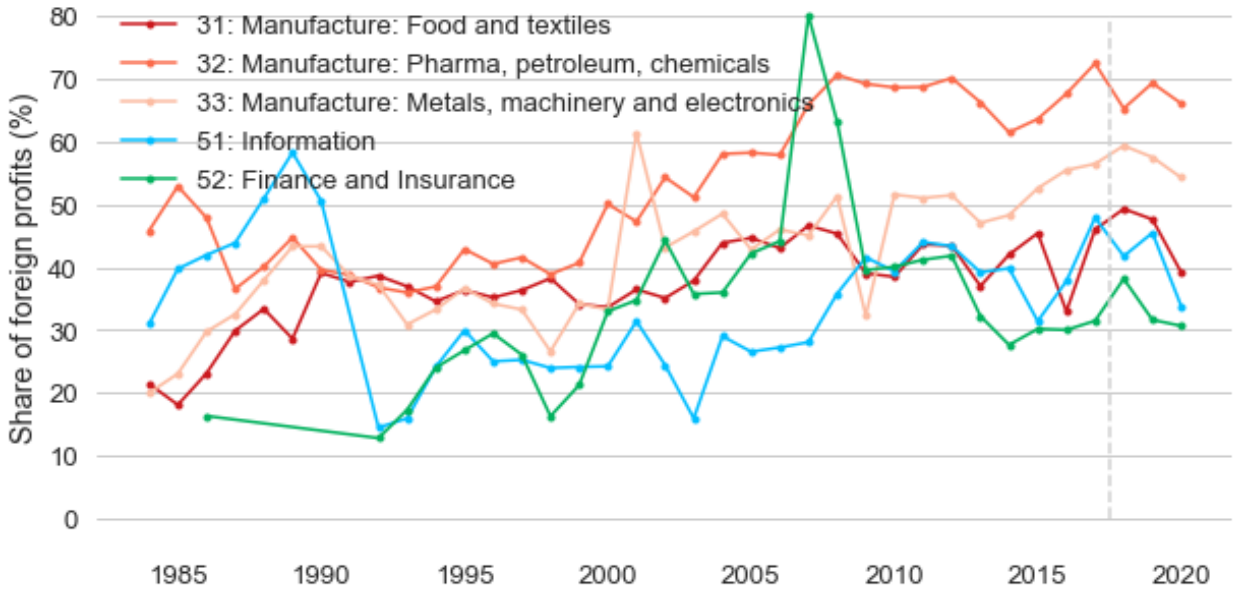
Notes: Source: BEA.

Figure A6: Increase in foreign profits for companies



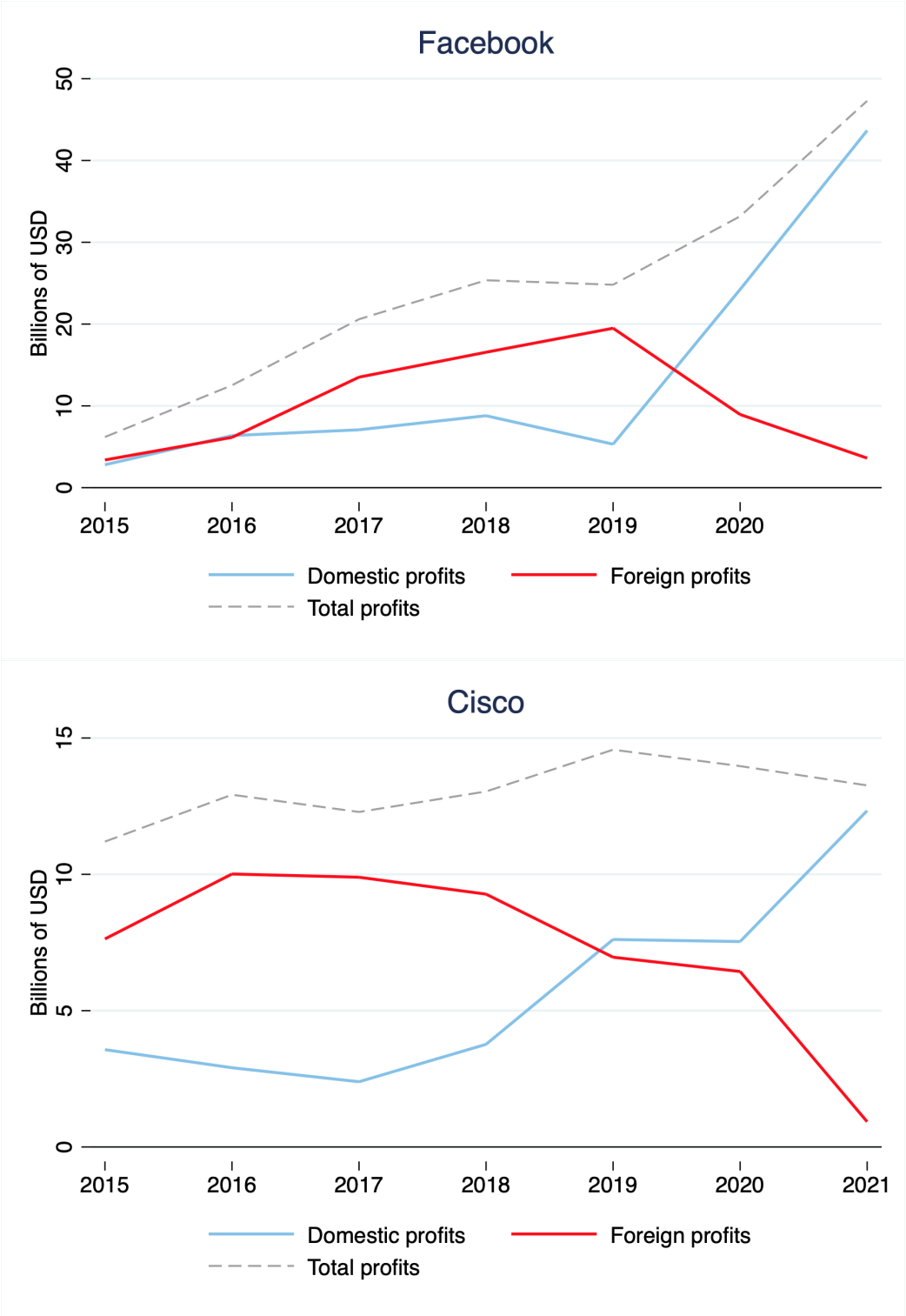
Notes: The distribution of changes in profits between 2015/16 and 2018/19 (and, for comparison, between 2012/13 and 2015/16) does not differ systematically across sectors. The NAICS codes of mining and oil extraction (21), manufacture (31–33), information (51) and finance and insurance (52) are colored. All other NAICS codes are marked in gray. Furthermore, in this figure we do not observe many firms that are around the 0% line on the x-axis and below the 0% line on the y-axis (i.e., moved profits home after the TCJA). Only the largest 80 companies with profits in the three periods (2012/3, 2015/16 and 2018/9) are included. The largest companies are annotated and the bubble size is proportional to profits in 2018/19. Source: Compustat.

Figure A7: Share of foreign profits in selected sectors



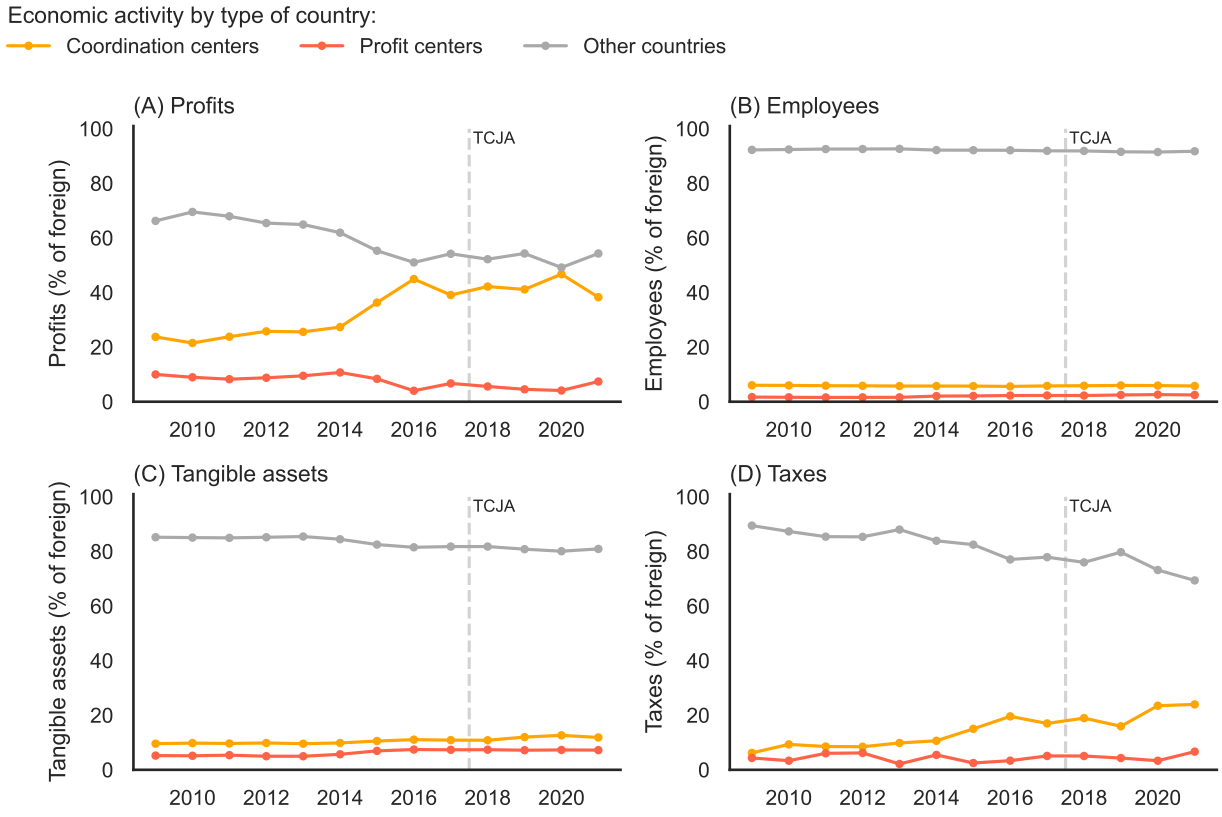
Notes: Source: Compustat.

Figure A8: Total, domestic, and foreign profits series showing changes in profit shifting for Cisco and Facebook



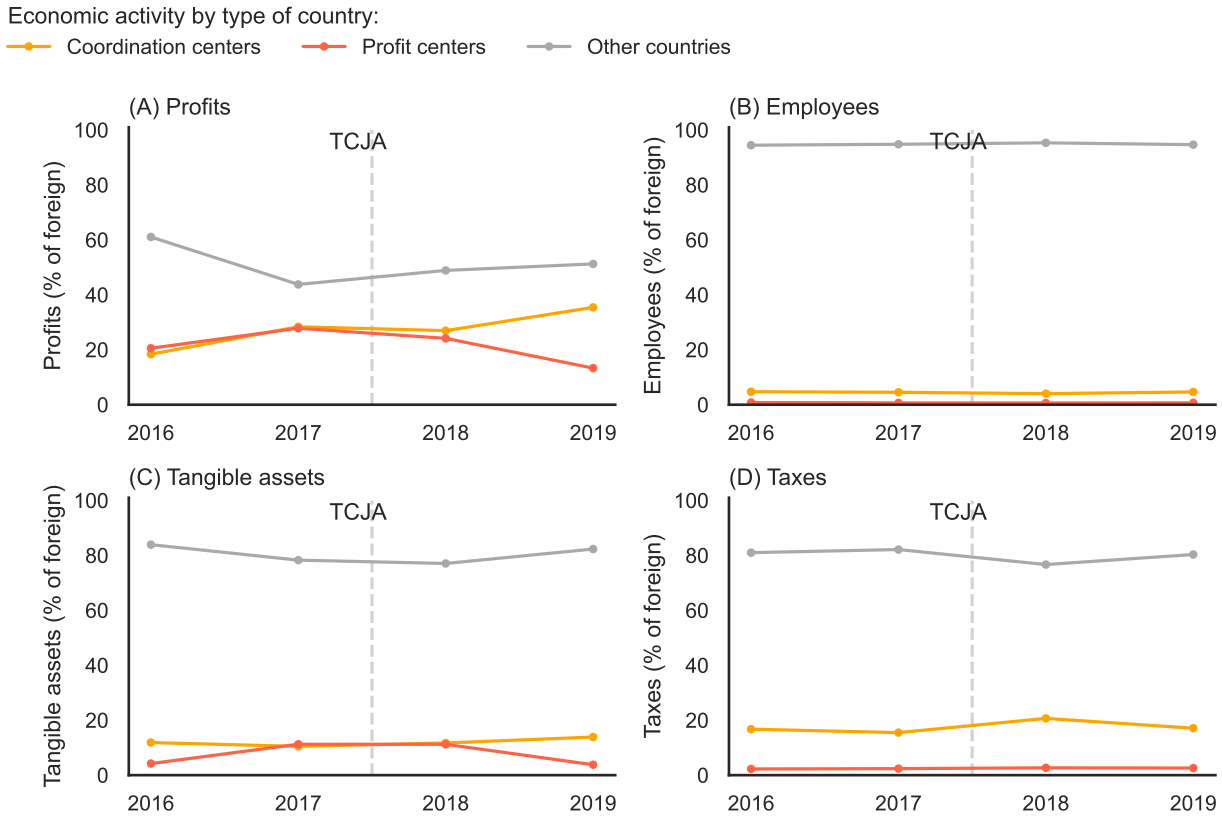
Source: Compustat

Figure A9: Share of foreign profits, employees and tangible assets



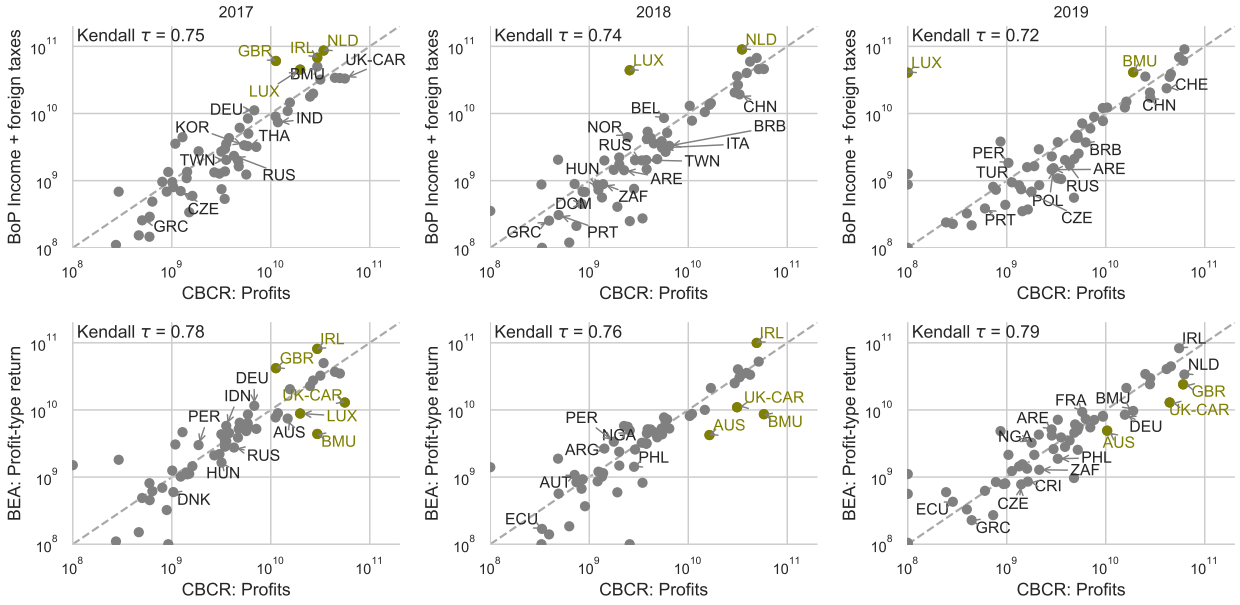
Notes: BEA survey. See text for definition of profit center and coordination centers.

Figure A10: Share of foreign profits, employees and tangible assets



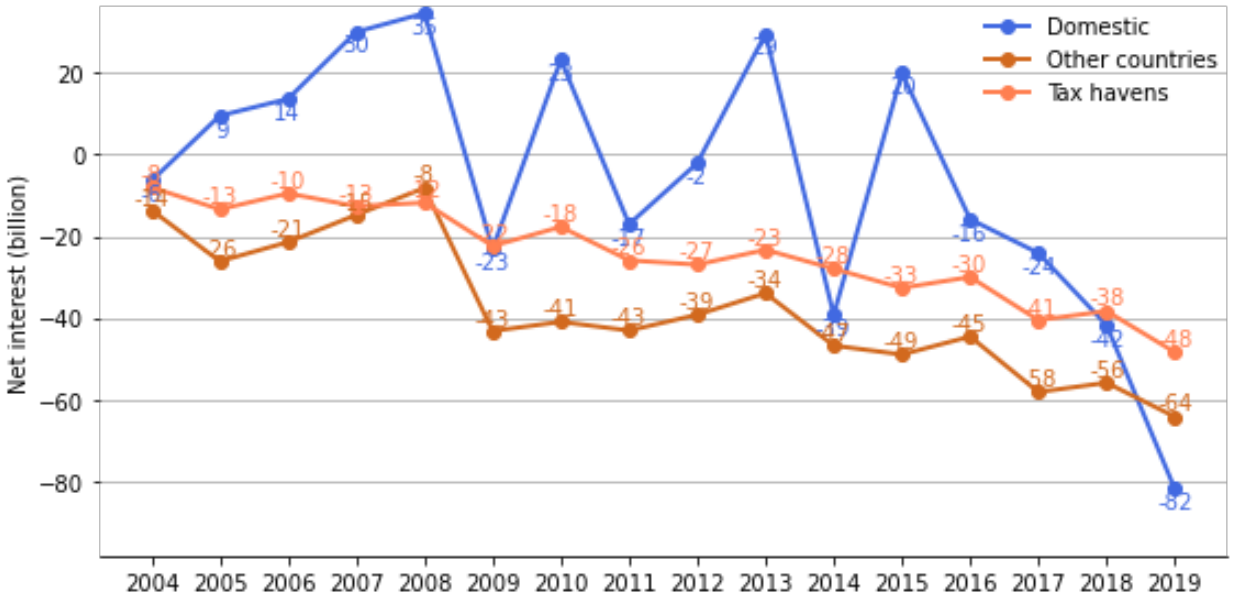
Notes: CBCR data. See text for definition of profit center and coordination centers.

Figure A11: Comparison of CBCR and BEA



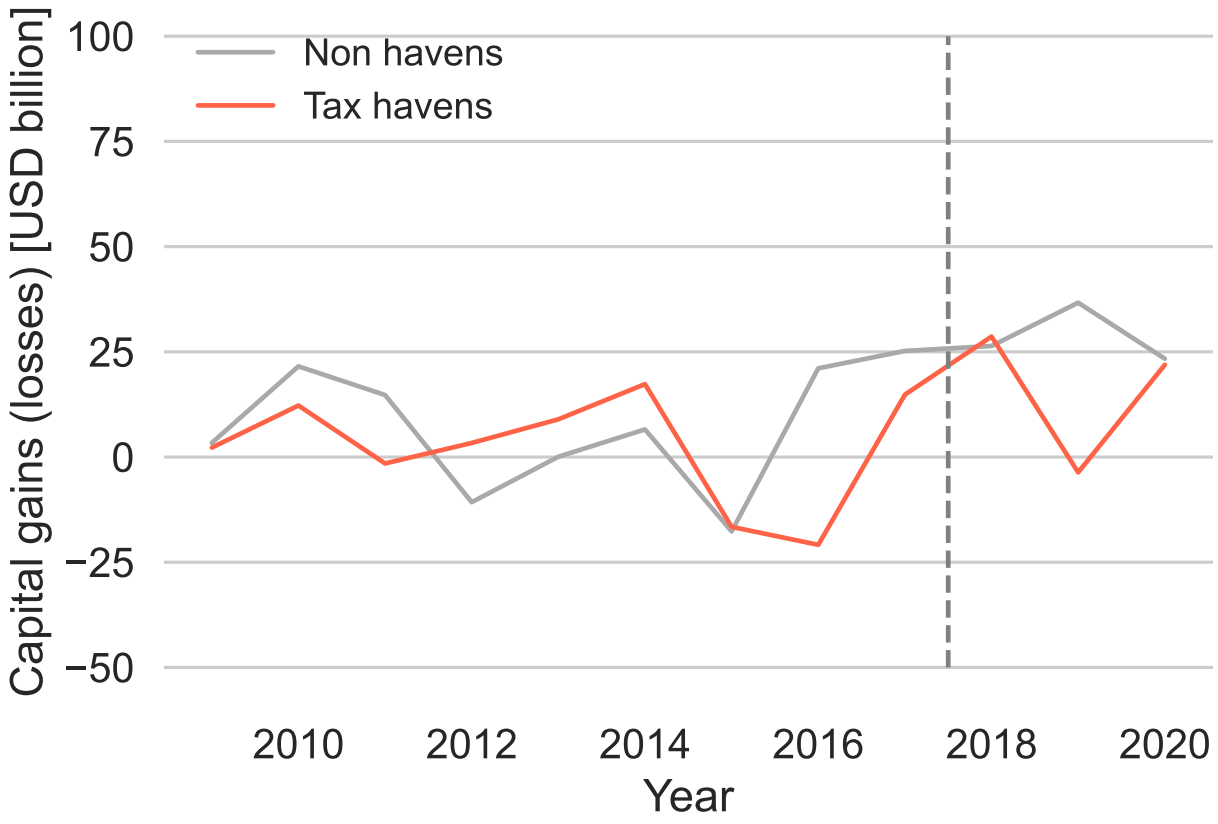
Notes: "BoP income + foreign taxes" equals direct investment income (as published in the international economic accounts) plus foreign income taxes paid by majority-owned foreign affiliates (from the BEA survey) plus the current-cost adjustment allocated proportionally to DI income + income taxes. Total "BoP income + foreign taxes" lines up very closely with direct investment equity income reported in Table 1 of the main text. Countries where the difference between the two sources exceeds 50% of the smaller value are annotated. Countries where the difference exceeds 100% are visualized in olive.

Figure A12: Net interest paid for the United States, tax havens and other countries



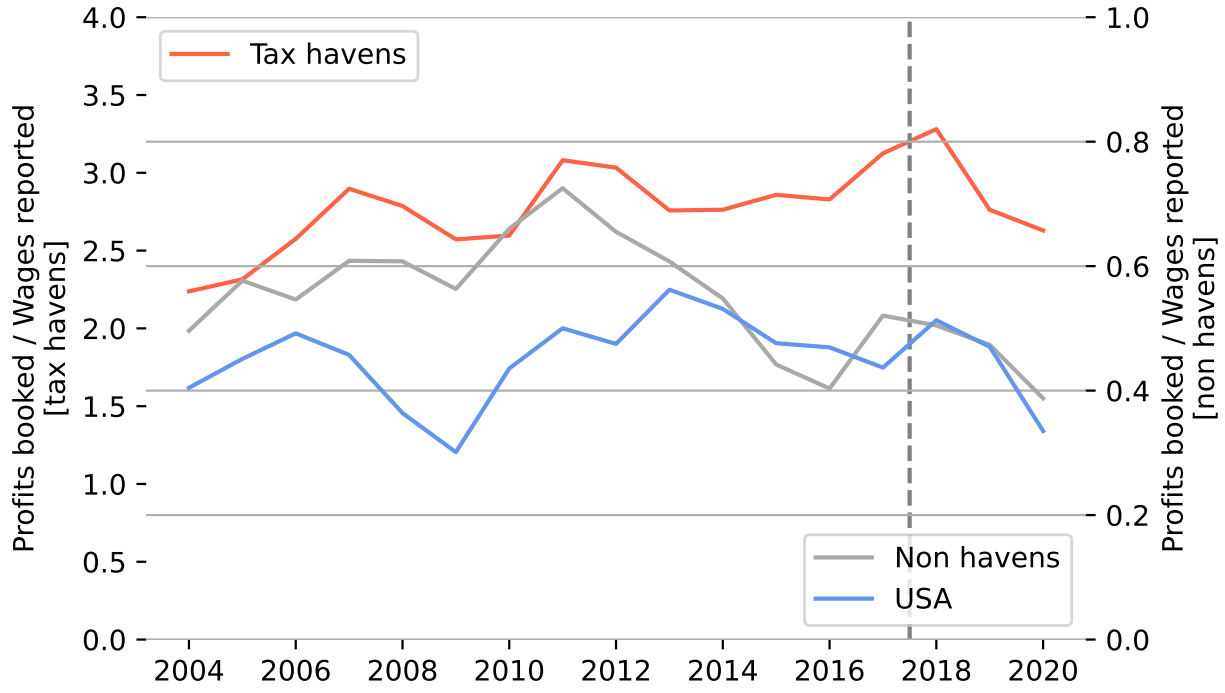
Notes: Net interest equals monetary interest payments plus imputed interest paid minus monetary interest receipts minus imputed interest received. Imputed interest paid and received, which are measures of the value of services provided by life insurance carriers and financial intermediaries without explicit charge, are estimated. Source: BEA survey.

Figure A13: Evolution of reported capital gains



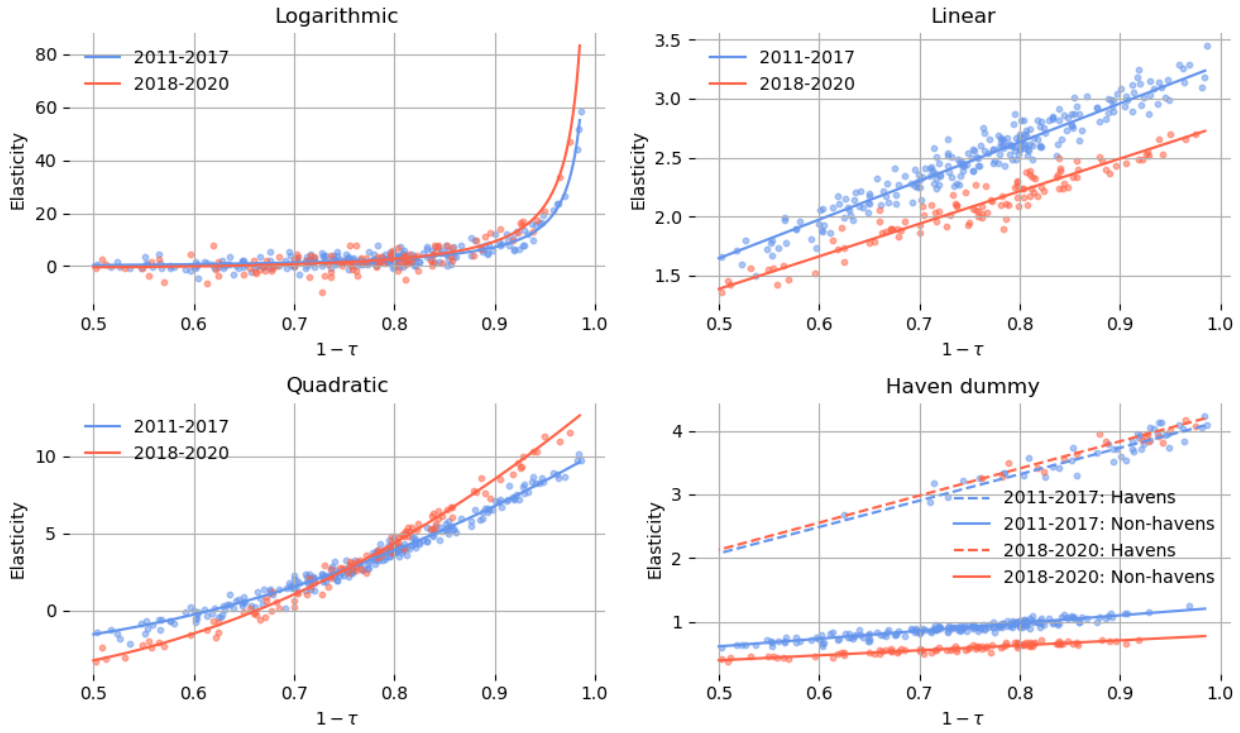
Notes: Source: BEA survey.

Figure A14: Evolution of the profits to wages ratio



Notes: Profit-type return divided by total wages. Source: BEA survey.

Figure A15: Changes in Sensitivity of Profits to Tax Rates: the Inclusion of 2017



Notes: The tax semi-elasticity estimated by four specifications—linear, quadratic, haven dummy and logarithmic—using the BEA data for a period before the TCJA (2011-2016) and after (2018-2020) with year fixed effects. A robustness check of the inclusion of 2017 in the pre-reform period in contrast with the baseline Figure 5.

G Appendix Tables

Table A2: Estimating Double-Counting in the Country-by-Country Data

		Compustat		CBCR			Imputation of missing profits using regression: Step 1		Step 2					Other datasets				
	Year	Profits	N	Profit (inc. stateless)	Profit (exc. Stateless)	N	Profit	N	**Final Profit**	Double count (inc. stateless)	Double count (exc. stateless)	Double count (inc. stateless) USD billion	Double count (exc. stateless) USD billion	Orbis (N = 1,234; 1,221,; 1,201)	Horst & Curatolo (N = 1,349)	DI	Profit-like	CFC
Dom	2017	641	1.325	1.180	1.180		750	1.428	**765**	54%	54%	415	415					
	2018	748	1.345	1.488	1.488		842	1.453	**856**	74%	74%	632	632					
	2019	684	1.323	1.296	1.296		893	1.431	**911**	42%	42%	385	385					
For	2016	450	1.313				475	1.415	**486**							567	473	706
	2017	551	1.325	842	638		584	1.428	**596**	41%	7%	246	42			669	570	
	2018	617	1.345	1.116	918		647	1.453	**658**	70%	39%	458	260			694	580	
	2019	560	1.323	933	768		590	1.431	**602**	55%	28%	331	166			671	547	
Total	2017	1.342	1.444	2.022	1.818	1.575	1.334	1.444	**1.361**	49%	34%	661	457	1.317	1.450			
	2018	1.493	1.468	2.604	2.406	1.641	1.489	1.468	**1.514**	72%	59%	1.090	891	1.418				
	2019	1.490	1.443	2.229	2.064	1.698	1.483	1.443	**1.513**	47%	36%	716	551	1.502				
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R

Notes: The table provides basic descriptive statistics for US multinational companies on the basis of a variety of data sources and our new estimates correcting for double-counting in the CBCR data. We present profits along with the number of companies, whenever available, for 2017, 2018 and 2019 for their total as well as for their domestic and foreign activities. The table provides information from Compustat, and the CBCR data as published by the IRS, as corrected for double-counting by Horst and Curatolo (2020) and as corrected by us in this paper. We estimate total profits at $1,361 bn, $1,514 bn and $1,513 in 2017,2018 and 2019, which implies a double-counting of 34%, 59% and 36% (excluding stateless entities). We estimate the double-counting in the United States at 54%, 74% and 42% ($415 bn, $632 bn and $385 bn), while the double-counting in foreign countries stands at 7%, 39% and 28% ($42 bn, $260 bn and $166 bn). Including stateless entities increases double-counting in foreign countries by around $200 bn in all three years. The CBCR data corrected for double-counting exhibits total foreign profits similar to the various BoP and BEA series (between $573 and $659 bn in 2017 and between $608 and $702 bn in 2018), which include comprehensive coverage of US multinational companies akin to the CBCR data.

Table A3: Business-Cycle Adjustment of Foreign Profit Share

	OLS	OLS (HC1)	OLS (HAC)
const	35.752	35.752	35.752
	(1.303)	(1.049)	(1.124)
ROW growth	2.325	2.325	2.325
	(0.557)	(0.442)	(0.491)
US growth	-3.832	-3.832	-3.832
	(0.499)	(0.473)	(0.545)
Price index	-0.035	-0.035	-0.035
	(0.131)	(0.116)	(0.132)
R-squared	0.749	0.749	0.749
R-squared Adj.	0.719	0.719	0.719
N	29	29	29
R2	0.749	0.749	0.749

Notes: The table reports regressions of the raw foreign profit share of US multinational corporations on foreign (ROW) GDP growth, US GDP growth, and the US price index growth, using BEA survey data. Column (1) presents standard OLS estimates. Column (2) reports OLS estimates with heteroskedasticity-robust (HC1) standard errors, and Column (3) reports OLS estimates with Newey–West heteroskedasticity and autocorrelation consistent (HAC) standard errors, with the optimal lag length chosen according to the rule of thumb $\lfloor 4(T/100)^{2/9} \rfloor = 3$. Standard errors are shown in parentheses. The estimates indicate that foreign profit shares are positively correlated with foreign GDP growth and negatively correlated with US GDP growth, while the US price index has no significant effect.
US and foreign GDP growth rates are taken from the World Bank Development Indicators (WBD), and the US price index is from the Federal Reserve Bank of St. Louis (FRED). The US price index is proxied by the broad U.S. dollar index from FRED (DTWEXBGS_PCH). Missing values in early years are backfilled using the discontinued broad dollar index (DTWEXB_PCH) and, when necessary, the major currencies index (DTWEXM_PCH). The estimates indicate that foreign profit shares are positively correlated with foreign GDP growth and negatively correlated with US GDP growth, while the US price index has no significant effect.

Table A4: Case studies of large falls in the foreign income share

Falls related to a change in profit shifting

Company Name	Year	Decline in the Foreign Share (Percentage Points)	Estimated Increase in 2020 Domestic Profits (Millions of USD)	Details
Alphabet	2020	36.0	17,288	In 10-K (2019): "As of December 31, 2019, we have simplified our corporate legal entity structure and now license intellectual property from the U.S. that was previously licensed from Bermuda."
Microsoft	2019	21.5	16,328	In 10-K (2019): "In the fourth quarter of fiscal year 2019, in response to the TCJA and recently issued regulations, we transferred certain intangible properties held by our foreign subsidiaries to the U.S. and Ireland..."
Facebook	2020	43.1	14,295	Domestic and foreign profits move almost symmetrically, clearly indicating a change in profit shifting.
Cisco	2019	28.5	4,223	Domestic and foreign profits move almost symmetrically, clearly indicating a change in profit shifting.
Qualcomm	2019	88.8	4,697	In 10-K (2019): "During fiscal 2018, one of our Singapore subsidiaries distributed certain intellectual property to a U.S. subsidiary."
Nike	2019	36.4	4,498	In 10-K (2020): "The foreign derived intangible income benefit reflects U.S. tax benefits introduced by the Tax Act for companies serving foreign markets. This benefit became available to the Company as a result of a restructuring of its intellectual property interests."

Notes: The estimated increase in 2020 domestic profits is the difference between realized domestic profits in 2020 and our estimated counterfactual level of domestic profits absent the tax reform. This counterfactual is calculated by multiplying the foreign share of profits before the fall with total profits in 2020. An alternative estimate uses the magnitude of the fall instead, and yields very similar results. In both cases, our measure for the foreign share before the fall consists on the previous three year average, though once again, restricting the measure to the year immediately before the fall does not yield very different results.

Falls possibly related to a change in profit shifting

Company Name	Year	Decline in the Foreign Share (Percentage Points)	Estimated Increase in 2020 Domestic Profits (Millions of USD)	Details
Pfizer	2018	38.0	3,136	Change of intra-group lending practices reported on 10-K (2018), yet quantitative evidence is not fully consistent with a change in profit shifting.
HP	2020	36.4	1,175	Some quantitative evidence suggesting a possible change in profit shifting.
Metlife	2019	74.5	5,996	Some quantitative evidence suggesting a possible change in profit shifting. Intra-group transfer of assets reported on 10-K (2019) but the country of origin (UK) is not usually inked to profit shifting.
Netflix	2018	20.7	1,247	In 10-K (2019): "In connection with the Tax Cuts and Jobs Act of 2017, we simplified our global corporate structure, effective April 1, 2019. [É] The increase in our effective tax rate [...] is primarily due to the global corporate structure simplification". However, the fall in the foreign share is mainly caused by an increase in domestic profits, and data for 2019 shows no clear change in trends.
Abbot Laboratories	2020	23.4	1,161	Some quantitative evidence suggesting a possible change in profit shifting.
Newmont	2019	70.1	966	Some quantitative evidence suggesting a possible change in profit shifting.

Notes: The estimated increase in 2020 domestic profits is the difference between realized domestic profits in 2020 and our estimated counterfactual level of domestic profits absent the tax reform. This counterfactual is calculated by multiplying the foreign share of profits before the fall with total profits in 2020. An alternative estimate uses the magnitude of the fall instead, and yields very similar results. In both cases, our measure for the foreign share before the fall consists on the previous three year average, though once again, restricting the measure to the year immediately before the fall does not yield very different results.

Falls unrelated to profit shifting

Company Name	Year	Decline in the Foreign Share (Percentage Points)	Estimated Increase in 2020 Domestic Profits (Millions of USD)	Details
Walmart	2018	63.3	4,528	The fall in foreign profits is due to losses on the sale of a foreign subsidiary.
Coca-Cola	2019	28.8	3,018	The fall in the foreign share is caused by a rapid increase in domestic profits and no significant decline in foreign profits.
Thermo Fisher Scientific	2019	23.9	2,437	The fall in the foreign share is caused by a rapid increase in domestic profits and no significant decline in foreign profits.
Mondelez	2018	21.1	1,608	The fall in the foreign share is caused by abnormally high foreign profits in 2015.
Paypal	2019	23.0	2,654	The fall in the foreign share is likely linked to the acquisition of a foreign corporation unrelated to profit shifting, and is partially reversed in 2021.
General Motors Financial	2018	22.0	732	The fall in the foreign share is caused by a rapid increase in domestic profits and no significant decline in foreign profits.
Newmont	2019	70.1	966	The fall in the foreign share is likely due to low and volatile profits, and is partially reversed in 2021.
Salesforce	2018	62.4	2,095	The fall in the foreign share is caused by a rapid increase in domestic profits and no significant decline in foreign profits.
Ball Corporation	2018	44.3	280	The fall in the foreign share is caused by abnormally high foreign profits in 2017.
Quanta Services	2020	26.9	154	The fall in the foreign share is likely due to low and volatile profits.
Stonex	2020	45.9	95	The fall in the foreign share is likely due to low and volatile profits.

Notes: The estimated increase in 2020 domestic profits is the difference between realized domestic profits in 2020 and our estimated counterfactual level of domestic profits absent the tax reform. This counterfactual is calculated by multiplying the foreign share of profits before the fall with total profits in 2020. An alternative estimate uses the magnitude of the fall instead, and yields very similar results. In both cases, our measure for the foreign share before the fall consists on the previous three year average, though once again, restricting the measure to the year immediately before the fall does not yield very different results.

Table A5: Regressions estimating tax semi-elasticity

	Log. 2010-2016	Log. 2018-2020	Linear 2010-2016	Linear 2018-2020	Quad. 2010-2016	Quad. 2018-2020	Dummy 2010-2016	Dummy 2018-2020
I((1-ETR) ** 2)					12.4649***	20.1330***		
					(3.2520)	(3.6180)		
Intercept	-1.6199	-1.4234	-2.6742*	-4.7697***	3.5326*	5.8791**	-2.4081**	-2.5752**
	(1.3459)	(1.6931)	(1.3956)	(1.7488)	(2.1072)	(2.4589)	(0.9866)	(1.1738)
R-squared	0.8285	0.8711	0.8092	0.8378	0.8228	0.8748	0.9100	0.9332
R-squared Adj.	0.8231	0.8638	0.8042	0.8302	0.8173	0.8676	0.9067	0.9287
haven							-0.7324	-1.7669
							(0.8276)	(1.4223)
haven:(1-ETR)							2.6640***	3.9359**
							(0.9629)	(1.6346)
log(0.001+ETR)	-0.9298***	-1.4531***						
	(0.2005)	(0.2791)						
log(GDP_int)	0.2374**	0.0659	0.1453	0.0455	0.1962*	0.0941	0.2667***	0.1951**
	(0.1081)	(0.1227)	(0.1118)	(0.1370)	(0.1088)	(0.1212)	(0.0776)	(0.0901)
log(POP_int)	-0.1247**	-0.0872	-0.1309**	-0.1272	-0.1132**	-0.1059	0.0071	-0.0002
	(0.0516)	(0.0691)	(0.0543)	(0.0767)	(0.0527)	(0.0678)	(0.0387)	(0.0510)
log(t_at)	0.7506***	0.7594***	0.8365***	0.9504***	0.7824***	0.7992***	0.7772***	0.7173***
	(0.0659)	(0.0991)	(0.0665)	(0.1028)	(0.0658)	(0.0948)	(0.0488)	(0.0759)
log(wages)	0.0824	0.2841**	0.0742	0.1686	0.0744	0.2459**	-0.0733	0.0899
	(0.0918)	(0.1134)	(0.0965)	(0.1241)	(0.0933)	(0.1105)	(0.0688)	(0.0865)
(1-ETR)	-1.4161	-3.9073***	2.9048***	2.6450***	-15.4827***	-26.8341***	0.9288**	0.6802
	(1.0486)	(1.3759)	(0.5062)	(0.6213)	(4.8220)	(5.3259)	(0.3977)	(0.4411)
N	198	112	198	112	198	112	198	112
R2	0.83	0.87	0.81	0.84	0.82	0.87	0.91	0.93
BIC	388.14	204.38	403.98	225.39	394.59	201.16	265.67	135.57