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THE TCJA'S IMPACT ON FOREIGN INVESTMENT TAX INCENTIVES

Thomas Brosy

April 21st, 2025

EXECUTIVE SUMMARY

The Tax Cuts and Jobs Act of 2017 (TCJA) was the most sweeping reform of US corporate and international tax policy since 1986. In this report, we find that the TCJA reduced tax burdens on foreign investment for many multinationals, but its impacts vary widely and result in low effective tax rates on foreign investment.

The TCJA was intended to simplify the tax treatment of multinationals and reduce tax burdens, while also imposing a minimum tax on foreign earnings of US-based multinationals and encouraging firms to locate economic activity and profits in the US. Before the TCJA, the statutory rate for US-based corporations was 35 percent, and one of the highest in the world, but foreign income was only taxed when repatriated to the US. The tax code allowed many forms of profit-shifting and deferral that resulted in low effective rates for many US multinationals. The TCJA lowered the statutory tax rate to 21 percent and exempted foreign income from the US corporate tax to align with most developed countries and incentivize investments. The TCJA also introduced a minimum tax on foreign income, called the global intangible low-taxed income (GILTI), to lower incentives for firms to shift their profits to low-tax jurisdictions and to combat aggressive tax avoidance by increasing the tax burden on low-taxed foreign income.

Did the TCJA achieve these goals? The Tax Policy Center's (TPC's) updated International Investment and Capital Model provides new insights on how the TCJA affected tax burdens for different types of multinational firms, investments, and behaviors. Growing evidence on the TCJA's impact suggests multinationals increased foreign investments and did not substantially change profit-shifting behaviors. Here we use TPC's International Investment and Capital Model to simulate effective average and marginal tax rates, which capture the total tax burden from foreign countries and the US on *new foreign investments*. The model estimates effective tax burdens for new investments across foreign countries and under differing assumptions.

Before the TCJA, multinationals could and would often defer income to avoid paying US taxes, but it was costly. The model estimates tax burdens until 2017 that vary depending on the cost of deferral. Since the enactment of the TCJA, US multinationals face a GILTI tax liability on their earnings, against which they can apply foreign tax credits. The model computes the tax burden on new investments depending on whether the company has excess foreign tax credits or GILTI liability. Finally, the total tax burden depends on the type of investment (machinery, structure, intangibles) and on how much of generated income is shifted to tax havens. These estimates can inform the next round of policy changes by identifying the types of companies and investments that saw the largest reduction in tax burden and whether the TCJA effectively reduced profit-shifting incentives.

The TCJA generally reduced the tax burden on foreign investments, but the effect varies depending on firm characteristics and behaviors. Firms that use all their tax credits—i.e., firms that have a residual GILTI liability—and had high deferral costs before the TCJA see a very large reduction in their tax burden, up to 15

percentage points. Firms with average deferral costs and moderate profit-shifting have reductions of 3 to 5 percentage points. Firms that shift profit aggressively and had little or no deferral costs see an *increase* in their tax burden, of about 4 to 6 percentage points, while those that had high deferral costs see a *decrease* of 4 to 6 percentage points. These findings align with empirical studies showing higher foreign investment in tangible assets.

The TCJA did little to change profit-shifting incentives and behaviors, and therefore the effective tax rates on foreign investments are still very low. The GILTI regime implemented a minimum tax designed to combat profit-shifting, but several of its mechanisms yield a very low effective tax in practice, and incentives to shift profits remained. Leveraging the model, we show that if shifting costs are zero or small, optimal profit-shifting after the TCJA was about the same or slightly lower. Under higher shifting costs, optimal profit-shifting after the TCJA was about equal for firms that have excess foreign tax credits, and lower for firms that can use all the foreign tax credits generated by a new investment against their residual GILTI tax liability.

When profit-shifting costs were low and 50 percent of income generated by new investments was shifted, the TCJA still lowered the tax burden on income from new investments. These findings align with empirical studies looking at where large multinationals report income, which showed either a small decrease in profit-shifting by US multinationals or no change post-TCJA.

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ACKNOWLEDGMENTS

This report was funded by Arnold Ventures. We are grateful to them and to all our funders, who make it possible for the Urban-Brookings Tax Policy Center to advance its mission.

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The author thanks Eric Toder, Ben Page, Joe Rosenberg, Tracy Gordon and others for their comments and feedback, as well as Serena Lei and Margaret Turner for their help editing the paper.

THE TAXATION OF FOREIGN INVESTMENT

US-based multinational corporations can invest in foreign countries directly or through foreign affiliates or subsidiaries they own, such as controlled foreign corporations (CFCs). These multinationals invest and earn income abroad in significant amounts: the value of assets invested by US multinationals abroad rose from about $450 billion in 1990 to more than $6.5 trillion in 2021, according to estimates from the Bureau of Economic Analysis.

US foreign direct investment doubled between 2007 and 2021, and the value of assets held abroad was distributed unevenly across jurisdictions. In 2021, more than three-quarters of all foreign assets were held in 10 countries.[1] Seven of the top 10 jurisdictions are usually classified as tax havens, and they held more than 50 percent of all foreign direct investments.[2] Although these numbers are unadjusted for potential double counting, which is an issue many scholars have pointed out, they still illustrate the weak correlation between foreign economic activity and reported foreign income.[3] The weak correlation often arises from profit shifting and tax avoidance strategies that reduce the corporate tax base and potentially erode trust in the tax system.

Foreign investment can also draw the ire of policymakers and US citizens. A common intuition is that a firm's resources are fixed, and that more foreign investment lowers domestic investment. But economic theory suggests that this depends on the structure of firms and whether capital at home and abroad are substitutes or complements. For example, Desai, Foley, and Hines (2005, 2009) show that when investment is horizontal (i.e., when multinationals replicate or move domestic production to a foreign jurisdiction), it can substitute away from domestic investment. But when investment is vertical (i.e., when different aspects of the production process are spread internationally), foreign capital often complements domestic activity, which can increase the demand for domestic capital. A recent analysis by Chodorow-Reich et al. (2023) concludes that the international tax reforms introduced by the TCJA resulted in increased foreign and domestic investment, suggesting that foreign investments after 2017 complemented domestic investments.

This report focuses on the overall tax burden on new foreign investments across jurisdictions and does not specifically estimate the relative impact on foreign versus domestic investment.

US taxation of foreign income before the TCJA

Until 2017, the US corporate tax system was a *de jure* worldwide tax regime, meaning that US corporations were subject to tax on their worldwide income. In practice, firms could avoid US tax liability on profit earned abroad until they repatriated income. This incentive to defer repatriating income led many US multinationals to keep large amounts of income in foreign countries (see Grubert and Altshuler 2013).

The combination of deferral and occasional tax holidays meant that US corporations sometimes paid very low effective tax rates on their foreign earnings, and the corporate tax system was *de facto* closer to a territorial tax regime. The value of deferral compounds over time and reduces the effective tax rate. For example, a

foreign subsidiary that makes $1 million in profit and invests it into a new capital with a rate of return of 10 percent would have $10.8 million over 25 years. If the company then repatriates the full amount at a corporate tax rate of 35 percent, it will have $7 million in after-tax income. This is equivalent to a yearly effective tax rate of 19 percent—almost half the statutory rate. Companies could also reasonably expect future tax holidays (like the one that occurred in 2004), lowering the expected tax rate on repatriated income.

A common worry among policymakers and economists was that deferral would lower domestic investment and lead to inefficient allocations of capital within multinationals, because multinationals could not easily access their foreign capital without paying a hefty tax. But multinationals devised new ways to use foreign retained earnings without repatriation. Common practices included using capital loans between affiliates or between an affiliate and its parent company and using unrepatriated earnings as collateral when borrowing capital (Beer, de Mooij, and Liu 2018).

Dyreng and Hanlon (2021) review the literature on the impact of "trapped cash," or foreign retained earnings, and find that companies with more trapped cash tend to have more domestic debt and a higher likelihood of less profitable foreign acquisitions. Dharmapala (2014) reviews findings on the impact of tax holidays and suggests that the most common use of repatriated income is larger shareholder distribution, without any noticeable impact on domestic investment and wages. Assessing the efficiency costs of "trapped cash" is complex. While it may have caused some inefficiencies in capital allocation and investment, it is unlikely to have been a pervasive issue.

Because of deferral, US multinationals had strong incentives to shift profit between their affiliates in high-tax jurisdictions and their affiliates in tax havens to lower their foreign tax liability. A common way to shift profit is through transfer pricing, which covers the price of goods and services transferred between affiliates of the same parent company. International tax agreements usually require intracompany transfers to be priced at arm's length, meaning at the price determined by the market between two unrelated companies. However, the transfer of some assets like intangibles have no market equivalent, making it difficult for tax authorities to enforce tax agreements.

Multinationals also use royalties and licensing as profit-shifting tools. For example, a large multinational may develop a patent in the US and then sell it to a subsidiary located in a tax haven (e.g., Bermuda). When an affiliate in a high-tax country (e.g., France) sells a product or service that relies on the patent, it must pay royalty to the subsidiary that owns the patent. If royalties are large, the French subsidiary will record very little profit, while the Bermuda subsidiary will record most of the profit from the French sales.

US taxation of foreign income after the TCJA

The TCJA cut the statutory corporate income tax rate to 21 percent from 35 percent and included four new key components on the taxation of multinationals: exempting dividends received from controlled foreign corporations (moving to a territorial tax regime), the global intangible low-taxed income (GILTI) regime, the

base erosion and anti-abuse tax (BEAT), and the foreign-derived intangible income (FDII) deduction. The TCJA also tightened interest expense deductions for businesses with at least $25 million in gross receipts, with a limit of 30 percent of business earnings before interest, taxes, depreciation, and amortization (EBITDA). Beginning in 2023, the new limit is 30 percent of business income *after* depreciation and amortization (EBIT—earnings before interest and taxes).

The new GILTI regime is a minimum tax on foreign earned income by US multinationals. The GILTI is calculated as the total active income earned by the foreign affiliates of a US company in excess of 10 percent of the firm's depreciable tangible property.[4] Corporations can deduct 50 percent of GILTI income when calculating US tax liability, which means the tax rate on GILTI income is 10.5 percent, half the regular corporate income tax rate of 21 percent. The GILTI tax base is defined as the excess of tested foreign income (i.e., net foreign income and losses across affiliates after deductions) over a 10 percent return on depreciable tangible assets of the foreign affiliate.[5] In addition, companies can claim foreign tax credits (foreign tax credits for 80 percent of deemed foreign taxes paid or accrued on GILTI. The exemption of foreign profits and the GILTI tax represent a new hybrid regime, somewhere between a territorial regime and a worldwide regime.

An important feature of GILTI is the "pooling" of GILTI liability and foreign tax credits. US corporations calculate their GILTI liability and foreign tax credits for each controlled foreign corporation but then pool them to determine their final tax liability. The pooling method allows companies to use their excess foreign tax credits in high-tax jurisdictions to reduce their GILTI liability in low-tax jurisdictions. The following example illustrates the pooling method but for simplicity ignores foreign taxes grossed up and the inclusion percentage to estimate the foreign tax credit.[6] A large US corporation owns foreign subsidiaries in Bermuda and France. The Bermuda subsidiary records $40 million in net foreign income and pays no tax; the French subsidiary earns $20 million in foreign income after tax and pays $5 million in taxes. The Bermuda subsidiary owns no tangible asset, and the French subsidiary owns $100 million of depreciable property. The GILTI for this corporation would be $50 million ($60 million in foreign income minus 10 percent of $100 million in depreciable tangible assets). The US tax on GILTI would be $5.25 million (half of $50 million times the 21 percent corporate rate), and the corporation can claim $4 million in foreign tax credits (80 percent of $5 million), with a net GILTI liability of $1.25 million.

A rationale behind the GILTI regime was to lower profit-shifting incentives and raise additional revenue by taxing foreign earned income. In 2018, the US recorded $342 billion in GILTI income, most of which ($310 billion) was attributed to companies with more than $2.5 billion in assets. In 2021, the latest year with data available from the IRS, the US recorded $608 billion in GILTI income, of which $569 billion was attributed to the largest US multinationals. In 2017, the Joint Committee on Taxation estimated that tax revenues from GILTI would be close to $10 billion a year from 2019 to 2025, and between $15 and $20 billion in 2025 and 2026, because the GILTI deduction is scheduled to become 37.5 percent instead of 50 percent after December 31,

2024, bringing the GILTI statutory rate to 13.125 percent. There are no official data on GILTI estimates, but GILTI tax revenues are likely higher than the original estim96ates.

Along with the GILTI regime, the US introduced the BEAT, a law designed to limit some profit-shifting methods used by US corporations to lower their domestic tax liability.[7] The BEAT targets US multinationals and foreign domestic corporations that lower their US tax liability through mechanisms like deductible payments, such as interests, royalties, and service payments to related foreign entities. The BEAT works as a minimum tax added to the regular tax liability. A US corporation calculates its tax on income before specific deductions at the BEAT rate: 5 percent in 2018, 10 percent in 2019 through 2025, and 12.5 percent in 2026 and beyond. The corporation must pay the higher of the BEAT liability and its liability under the regular corporate tax.

The TCJA also introduced a deduction for foreign-derived intangible income (FDII), which offers reduced taxation on foreign earned income reported by domestic corporations (e.g., income earned from exporting goods and services). The FDII is a type of "patent box" regime enacted to encourage multinational corporations to locate intangible assets in the US rather than in offshore jurisdictions.[8] The FDII regime became effective in January 2018, and it offers a reduced tax rate of 13.125 percent on export income in excess of a 10 percent return from tangible assets; this tax rate is set to increase to 16.4 percent after 2025.[9] The following example illustrates FDII. A company has $200 million in US income, $50 million of which is from foreign sales (export income), and US tangible assets worth $400 million. Total income in excess of 10 percent of tangible assets is $160 million (200 – 0.1 * 400) and the fraction of income from exports is one-fourth, so FDII is $40 million (0.25 * 160). The $40 million of FDII is taxed at the preferential rate of 13.125 percent, while the remainder of income ($160 million) is taxed at the regular corporate income tax rate of 21 percent.

Foreign direct investment and profit shifting

Multinational corporations take many factors into consideration when deciding where to invest, such as costs of production, local labor markets, supply chain factors, political and economic stability, financing terms, and tax incentives. Vaz da Fonseca, Savelli, and Juca (2020) do a systematic review of the most influential research in the extensive literature on the impact of taxes on foreign direct investment. Their main conclusion is that taxes matter; however, the complexity of tax legislation and imperfect data make it challenging to estimate broad elasticities between tax rates or characteristics of the tax system and foreign investment. Our modeling offers some valuable insights on the taxation of foreign income before and after the TCJA and across foreign jurisdictions. But it also exemplifies how the tax burden on new investments is highly contingent on the characteristics of the firm.

Because of its prevalence, profit-shifting behavior by multinationals is a critical element incorporated in our modeling strategy. Dharmapala (2014) and Dyreng and Hanlon (2021) survey the empirical literature on tax avoidance and tax-motivated income shifting by multinationals. Earlier research sought to estimate the semi-elasticity of profit shifting with respect to the tax differential between two jurisdictions. For example, a semi-

elasticity of 1.5 implies that when the tax differential decreases by 1 percentage point, reported profits in the low-tax jurisdiction increase by 1.5 percent.

A common approach to derive these elasticities—pioneered by Hines and Rice (1994) and Grubert and Mutti (1991)—consists of comparing capital and labor inputs of an affiliate with its reported income, which is the sum of true earned income and shifted income. Using aggregated data, Hines and Rice (1994) find a profit-shifting semi-elasticity of 2.25, but more recent research using microdata finds smaller semi-elasticities of between 0.5 and 1.3 (Dharmapala 2018). However, Tørsløv, Wier, and Zucman (2023) suggest that firm-level accounting data in the widely used Orbis database tend to vastly underestimate reported profits in tax havens, questioning the semi-elasticities calculated with that data.

To measure the amounts of profits shifted by multinationals, Tørsløv, Wier, and Zucman (2023) develop a method based on comparing the profitability of foreign affiliates and domestic firms in tax havens. They find that "36 percent of multinational profits made outside of the country where the parent is located were shifted to tax havens in 2015," and "US firms shifted more than half of their profits compared to about a quarter for other multinationals." Wright and Zucman (2018) document a significant rise in profits booked by affiliates in tax havens compared with nontax havens by US multinationals. Clausing (2016) documents that income shifting by US multinationals cost the US government and other countries large amounts of tax revenues: between $77 and $111 million annually in 2012 in the US.

Blouin and Robinson (2020) challenge the consensus and argue that the data used by Clausing suffers from double counting, where profits are counted twice when a multinational has multiple layers of subsidiaries. However, Clausing (2020a) shows that the adjustment made by Blouin and Robinson (2020) has its own issues and is likely to underestimate profit shifting. Tørsløv, Wier, and Zucman (2023) use the Bureau of Economic Analysis data that is not vulnerable to double counting, as well as other sources in their estimates. Overall, while imperfect data and double counting potentially overestimated the extent of profit shifting in earlier research, there is clear evidence that many US multinationals engage in profit shifting.

MODELING THE US TAXATION OF FOREIGN INCOME

TPC's new International and Investment Capital Model calculates forward-looking effective average tax rates (EATRs) and effective marginal tax rates (EMTRs) based on the Devereux and Griffith methodology (1998, 2003). The EATRs estimate the average tax burden on a new profitable investment in a new location and are widely used by practitioners to compare tax incentives across different locations. For example, the Organisation for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF), and the US Department of the Treasury construct and publish effective average and marginal tax rates on a regular basis (typically yearly). The EATRs are most relevant for firms that must choose where to locate new profitable investments.

The EMTRs are also forward-looking and estimate the tax burden on a new investment that just breaks even after taxes. They are useful for evaluating how taxes incentivize marginal investment and assessing the optimal level of investment. Forward-looking tax rates apply to new investments and can be very different from historical effective tax rates, which are estimated as the amount of taxes paid divided by reported income in a defined period. Forward-looking tax rates rely on a set of assumptions, such as the profitability of a new investment, the economic depreciation of new assets, real interest rate, and inflation.

In this report, we show effective average and marginal tax rates for investments financed with retained earnings or debt for three types of assets: buildings, machinery, and intangibles. We use data from the Oxford Center for Business Taxation, the IMF, and the OECD to generate tax rates between 2010 and 2020. Here we focus on the outcomes of the model; complete derivations, data, and methodology are presented in a separate technical paper (Brosy 2024).[10]

Modeling the tax burden before the TCJA

For firms that chose to repatriate foreign income until 2017, the applicable tax rate on a new foreign investment was simply the maximum rate between the US tax rate of 35 percent and the foreign tax rate, because foreign tax credits paid on the income repatriated could be applied against US tax liability. Firms that chose to not repatriate or to only repatriate during tax holidays paid foreign taxes and the cost of deferring foreign income, which include the present value of future expected US taxes (e.g., through repatriation, tax holidays, or future tax reform), administrative and tax planning costs, financing costs (e.g., issuing debt in the US and using income held abroad as collateral), and other frictions caused by the tax system, such as potential inefficiencies in allocating capital.[11]

In the effective tax rate framework, it is advantageous to represent the cost of deferral as an added tax rate on foreign income. Intuitively, this cost depends on the discount factor of the company on deferred income, and the amount of income deferred, captured by the tax differential between US and average foreign taxes (see appendix for technical details). When a multinational expects to never repatriate income, deferral creates no financial frictions or misallocation of capital. Multinationals with access to cheap financing and a high discount factor would likely have small deferral costs. To get an idea of the approximate size of deferral costs, we leverage data on firms that repatriate income during tax holidays, such as the American Job Creation Act of 2004, when corporations had the option to repatriate income at a lower rate and receive a lower foreign tax credit. For example, in 2005, multinationals could have repatriated foreign income at 15 percent of the then tax rate and used 15 percent of foreign tax credits on repatriated income. Assuming that corporations would only repatriate if their deferral costs are larger than the cost of repatriating income, we can calculate the minimum implied cost of deferral on the share of income repatriated.[12]

In the model, we can allow for the deferral rate to depend on the average foreign tax rate paid on a new investment. However, this is only informative for firms that invest in a single country, and the actual deferral cost is based on the tax burden of previous investments. Large US multinationals have operations in several

jurisdictions, and their cost of deferral would be based on their *average* foreign tax rate. To be able to compare the average tax burden before and after the TCJA on a new investment by a multinational in a specific country, we chose a fixed deferral cost. Based on the 2005 tax holiday, the average foreign tax rate on repatriated income was 10.5 percent, which implies the cost of deferral was about 3.7 percent. However, Grubert and Altshuler (2013) argue that the cost of deferral increases with the size of income held abroad, which was significantly larger in 2017 than in 2005. Therefore, we chose an illustrative baseline cost of deferral of 5 percent in our estimates.[13]

Modeling the tax burden under GILTI

The GILTI regime has key characteristics that corporations implement to derive EATRs and EMTRs. There are several important steps to determine the GILTI liability. First, a company calculates, in each controlled foreign corporation, the net tested foreign income equal to foreign income net of deductions and foreign taxes. Then the company subtracts the qualified business asset investment (QBAI) deduction by controlled foreign corporations to find the initial GILTI tax base. The GILTI regime allows corporations to use foreign tax credits against their GILTI liability, but foreign tax credits are limited to 80 percent of deemed foreign taxes paid, which is equal to foreign taxes paid times the inclusion percentage. The inclusion percentage captures the share of foreign income taxed under GILTI after applying the QBAI deduction in total foreign income. For example, if a multinational has foreign profit of $100 and a QBAI deduction of $25, the inclusion percentage is 0.75 and the company can use 60 percent of foreign taxes paid against its GILTI liability.

In the model, we normalize the new investment to 1 and the QBAI deduction to simply 0.1. When an investment is debt-financed, the QBAI is reduced by the amount of interest expenses. Abstracting from foreign taxes, it is straightforward to compute the net present value of an investment subject to GILTI. The EATR for equity-financed machinery is 7.4 percent and 6.1 percent for buildings. However, because interest costs are deducted from the QBAI deduction, debt-finance only slightly reduces EATRs to 6.6 percent for machinery and 5.8 percent for buildings.

When a corporation has a residual GILTI tax liability after a new investment, it follows that all foreign tax credits generated by the new investment are used, and the total tax burden on the new investment is the combination of the new GILTI liability and 20 percent of the foreign tax burden (assuming an inclusion percentage of 100 percent for exposition).

When a corporation has no residual GILTI tax liability after the investment, the new tax burden depends on the initial situation of the firm. For a greenfield investment, the tax burden is simply foreign taxes because the foreign tax credits (FTCs) fully cover the new GILTI liability. When a firm starts with a GILTI liability and has no residual GILTI liability after the investment, it follows that some of the FTCs generated by the new investment were applied against the previous tax liability, and the net tax burden on the new investment is equal to the excess of the foreign tax burden over the initial GILTI liability. For example, when a company starts with $20 in

GILTI liability and invests $1,000 that generates $200 in foreign income and incurs $60 of foreign taxes and $21 of new GILTI liability, it has $48 (0.8 * $60) of FTCs, $20 of which is applied to pay the starting GILTI liability. The total new tax burden is the sum of the new GILTI liability ($21), unused FTCs (48 - 21 – 20 = $7), and unallowed foreign taxes as FTC (60 – 48 = 12). It is equal to $40, equivalent to foreign taxes in excess of the initial GILTI liability. When a firm starts with excess FTCs before the investment, the tax burden is simply the foreign tax burden as with greenfield investments.

Profit shifting

An important rationale behind the GILTI minimum tax on foreign income was to limit profit-shifting incentives created by moving to a territorial tax system. In addition, the TCJA cut domestic corporate tax revenue, and GILTI was expected to raise new revenues on profits reported by foreign subsidiaries in low-tax jurisdictions. The GILTI regime—combined with the base erosion and anti-abuse tax (BEAT), expensing of domestic capital investment, and a lower corporate income tax rate—reduced incentives to shift profit from US parent companies to foreign affiliates (and shifting income out of the US by domestic affiliates of foreign multinationals). The GILTI tax also potentially created fewer incentives to shift profit across foreign affiliates. However, the "pooling" feature of the GILTI regime, which allows a parent company to pool foreign income and foreign tax credits when determining its total GILTI tax liability, maintained the value of profit shifting for many US multinationals. We incorporate profit shifting in our effective tax rate methodology to highlight how profit shifting impacts EATRs and EMTRs.

We incorporate profit shifting in the model by assuming that the company can shift a fraction of income generated by the new investment, at a cost that is a fraction of the investment. We assume that the company takes deductions (depreciation and interest expenses) in the country of investment and that it can only use those deductions against the income generated by the new investment. When the income left in the country of investment is smaller than the deductions, the company cannot benefit from the qualified business asset investment deduction, which is only available for controlled foreign corporations with positive income. See the appendix for a technical summary and Brosy (2024) for a full description of the model and derivations.

Results

We can now compare country-by-country effective tax rates on new investments before and after the TCJA.[14] The TCJA's impact on the total tax burden is driven by three major assumptions:

- cost of deferral until 2017
- amount of profit shifted
- treatment of excess foreign tax credits after 2017

Our model highlights three important results. First, assumption of the cost of deferral on foreign income is negatively correlated with the TCJA's impact. The costlier it is for firms to retain earnings abroad, the more

reduction they see in their total tax burden after the TCJA. Second, the TCJA substantially lowered the total tax burden on foreign investment in tangible assets when only a small fraction of income generated by the new investment was shifted. Third, the TCJA had a small impact on investments for which a large fraction of income was shifted, with the total tax burden on new investment slightly increasing in some countries while slightly decreasing in others. Finally, investments by firms that have a residual GILTI liability and can use all the foreign tax credits generated from a new investment see a much larger reduction of their effective average tax rates.

Removing the cost of deferral represents the benefit of moving toward a territorial tax system from a worldwide tax system. Corporations with negligible deferral cost only marginally benefit, but corporations that choose to repatriate income or have nonnegligible deferral cost (from 3 to 4 percent and higher) can greatly benefit from the dividend exemption under the new territorial tax regime. As previously discussed, it is unclear whether the GILITI regime has increased or decreased profit-shifting incentives on new investments; the answer likely depends on the initial situation of the firm. Finally, the treatment of excess foreign tax credits and whether a multinational has residual GILTI liability can strongly impact the tax burden on new investments. Below we compare EATRs before and after the TCJA, holding foreign tax laws constant based on year 2019, and present results for selected countries among the largest recipients of foreign direct investment.

Because most foreign investments are financed with equity and investments in tangible assets are especially relevant given the QBAI exemption, we discuss the TCJA's impact on investments financed with equity that consist of 50 percent of equipment and 50 percent of structures. Figure 1 reports the TCJA's impact on the EATRs, assuming that 25 percent of profit is shifted to a tax haven with no corporate taxation and the cost of deferral before the TCJA is 5 percent. The red bars represent the TCJA's impact on firms that do not have a residual GILTI liability before the new investment. The blue bars represent the TCJA's impact on firms that start with a residual GILTI liability, if all allowed foreign tax credits generated from the new investment can be used toward the GILTI liability from other investments (i.e., when a firm starts with a residual GILTI liability).

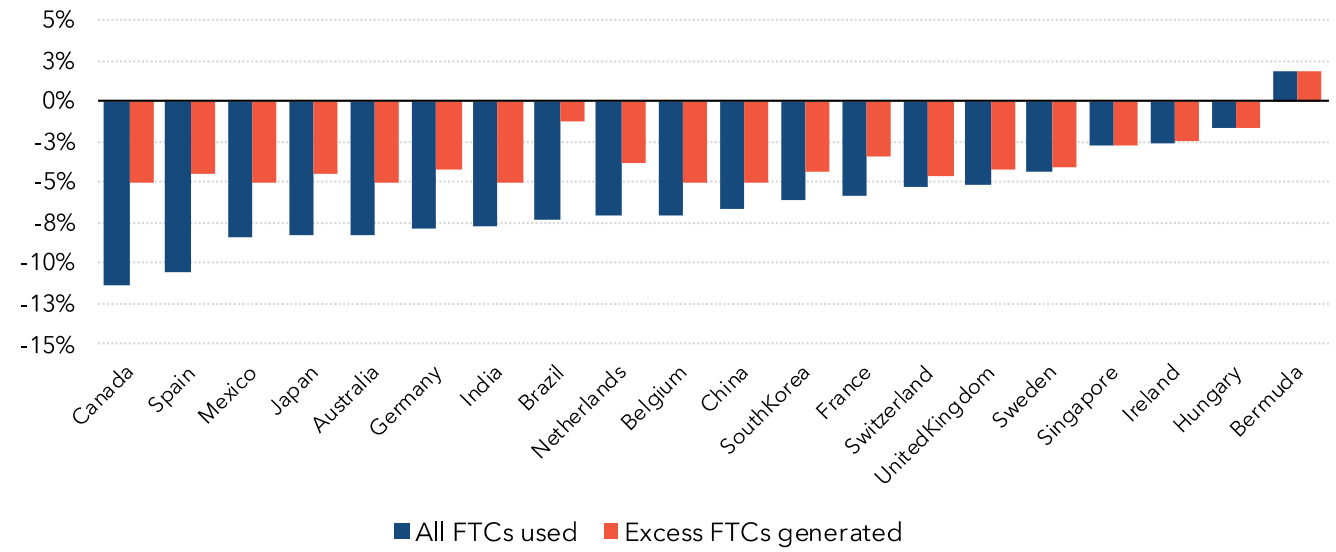
The TCJA lowered EATRs in all countries except Bermuda, where the corporate tax rate is zero. In Bermuda, the TCJA's impact simply represents the difference between the GILTI regime and the implied cost of deferral of 5 percent. Unsurprisingly, the impact is larger when all foreign tax credits can be used.

Before the TCJA, profit shifting reduced overall tax liability, but income shifted to a tax haven was still subject to the deferral cost. After the TCJA, profit shifting created a new GILTI liability in low-tax jurisdictions but also reduced the GILTI liability in the country of investment. Before and after the TCJA, companies have an incentive to shift profit to lower their foreign tax liability.

FIGURE 1

The TCJA's Impact on Outbound Effective Average Tax Rates

25 percent of profit shifted and assumed 5 percent deferral cost pre-TCJA



Source: Author's calculations.
Note: The reported EATRs are for equity-financed investments and assume that half of assets are buildings, and the other half are machinery and equipment.

Regardless of the treatment of foreign tax credits, companies benefit from moving to a territorial tax system with no deferral. And when the FTCs generated by the new investment are larger than the new GILTI liability, as is the case in many countries with 25 percent of profit shifted, companies that can use all foreign tax credits see greater reduction in EATR.

For example, suppose a company shifts a quarter of profits from a French investment. Before the TCJA, the French investment generated $100 of French taxes. After shifting 25 percent of profits, it generated $75 of French taxes and $5 of deferral costs in a low-tax country, and the final tax cost was $80. After the TCJA, the French investment generated $100 of French taxes and $20 of GILTI liability. Even if the company uses the French foreign tax credit against the GILTI liability, its final tax liability would still be $100. After shifting 25 percent of profits, the investment generated $75 of French taxes and $30 of GILTI liability, which means the overall tax liability was unchanged at $75, because the French foreign tax credit covered all the GILTI liability. If the French company uses its excess foreign tax credits, its final tax liability would be $45 ($30 + 20% * $75).

This implies that the smaller the deferral cost was before the TCJA, the smaller the value of moving to a territorial tax system. Similarly, when more profit is shifted, the foreign tax credit in the country of investment becomes too small to cover the foreign tax liability, which reduces the benefit of profit shifting because the corporation only pays 20 percent of foreign taxes.

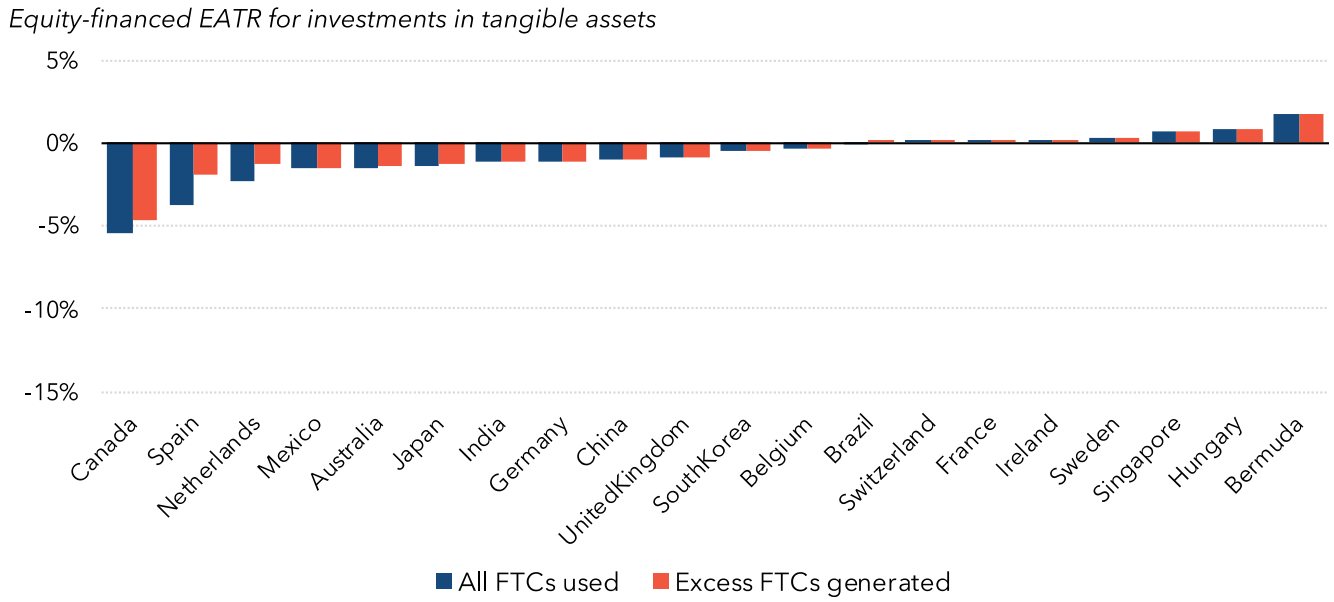
Figure 2 shows the TCJA's impact on the same EATRs but assuming that 50 percent of profit is shifted. There is no difference between companies that have residual GILTI liability or excess foreign tax credits before the investment because taxes in the country of investment are too low to generate excess foreign tax credits. The TCJA's impact is greatly reduced and EATRs increase in countries with lower initial tax liability.

As foreign taxes paid converge toward zero, the difference in EATRs converges to a situation with no foreign taxes, like in Bermuda. In the appendix, we present an outcome assuming 25 percent of profit shifted but with a cost of deferral of either zero or 10 percent. When the cost is zero, there is no value in moving to a territorial tax regime. The TCJA increased foreign tax burden, with some exceptions, when foreign taxes were high and the firm had initial residual GILTI liability. In contrast, when the deferral cost was 10 percent, the TCJA had a strong and negative impact in all countries, including tax havens.

FIGURE 2

The TCJA's Impact on Outbound Effective Average Tax Rates

50 percent of profit shifted and assumed 5 percent deferral cost pre-TCJA



Source: Author's calculations.
Note: The reported EATRs are for equity-financed investments and assume that half of assets are buildings, and the other half are machinery and equipment.

Summary and discussion

Tables 2 and 3 report the TCJA's average impact on equity financed EATRs for investments in tangible assets across a range of deferral costs and profit shifting, assuming the firm starts with a residual GILTI liability or with excess foreign tax credits (table 1). Using the total stock of foreign direct investment in 2019 in each foreign country, we estimated effective tax rates to calculate weighted averages.

In all scenarios, a higher cost of deferral results in a greater negative impact on EATRs, so moving to a territorial tax system becomes more valuable. Additionally, more profit shifting reduces the TCJA's negative

impact on EATRs. With no deferral costs, heavy profit shifting is less valuable after the TCJA. But with higher deferral costs, investments with greater levels of profit shifting still face a lower tax burden after the TCJA.

The only situation where the tax burden on foreign income increases is for corporations with low or no deferral costs and large profit shifting. These companies paid close to zero tax on cost of investment before the TCJA, and the GILTI reform introduced a lower bound on the tax burden.

TABLE 1

The TCJA's Average Impact on Outbound EATRs

All foreign tax credits used

Cost of deferral	Amount of profit shifted			
	0 percent	25 percent	50 percent	75 percent
No deferral costs	-5.5%	-0.5%	4.0%	6.2%
Deferral cost of 5 percent	-10.4%	-5.3%	-1.0%	1.2%
Deferral cost of 10 percent	-14.3%	-9.6%	-5.5%	-3.7%

Excess foreign tax credits allowed

Cost of deferral	Amount of profit shifted			
	0 percent	25 percent	50 percent	75 percent
No deferral costs	0.4%	1.5%	4.2%	6.2%
Deferral cost of 5 percent	-4.4%	-3.4%	-0.7%	1.2%
Deferral cost of 10 percent	-8.3%	-7.6%	-5.3%	-3.7%

Source: Author's calculations.
Notes: The average EATRs are weighted by total (unadjusted) FDI in 2019 in each foreign country of investment. EATRs are equity financed EATR with 50 percent buildings and 50 percent machinery and equipment.

More than six years after the TCJA was implemented, there has been a growing body of research evaluating its impact. Dharmapala (2024) reviews the existing literature on the TCJA's impact on international investment. Relevant to our discussion, he documents robust findings in the empirical literature. He finds that "the TCJA led to a general decline in US multinationals' foreign acquisitions," that "the TCJA increased US multinationals' investment in routine foreign tangible assets," and that "the reform did not lead to any change in profit shifting by US multinationals beyond the magnitude that would be expected based on the TCJA's tax rate reduction." Dharmapala also notes that the TCJA seems to have reduced foreign acquisition by US multinationals with some exceptions.

Regarding foreign acquisitions, Atwood and colleagues (2020) argue that higher incentives to invest domestically (e.g., FDII, expensing, and lower corporate tax rate) and lower incentives to invest abroad (e.g., BEAT, GILTI) overall predict a decline in foreign acquisitions, which they observe in the data. However, they find that a subsample of US multinationals increased foreign acquisitions: "After the TCJA, the likelihood and number of domestic target firm acquisition announcements increased more for US multinationals that faced

higher pre-TCJA repatriation taxes than for US domestic-only firms or for other US multinationals." They interpret this as driven by a subset of firms that were likely subject to the GILTI tax.

Our International and Investment Capital Model framework shows that the TCJA's impact on EATRs is ambiguous and likely small, on average. But the model predicts that firms with a high inferred cost of deferral until 2017 and a GILTI liability before new investments saw the largest decline in their total tax burden on new foreign investments, which aligns with the empirical findings by Atwood et al. (2020).

Amberger and Robinson (2023) show that cross-border acquisitions were less likely to be acquired by a US firm after the TCJA. But they also report that a subset of US firms increased acquisitions of foreign firms after the TCJA; these firms typically had little foreign presence until 2017. Dharmapala (2024) suggests that higher domestic cash flow because of the TCJA and potential underinvestment abroad before 2017, rather than a lower US tax burden on foreign income, explain these results.

However, it is also possible that firms with little foreign presence had high deferral costs and few profit-shifting opportunities compared with other US multinationals. Under these assumptions, our model predicts a lower tax burden on foreign investment, regardless of whether the firm had excess foreign tax credits or an initial GILTI liability.

Dharmapala (2024) also reports that "the general finding of a decline in US multinationals' cross-border acquisitions after the TCJA, especially of targets in lower-tax jurisdictions (i.e., those with below-median tax rates) appears to be robust across a variety of approaches." This aligns with our findings that the smallest decline (or even slight increases) in tax burden was for investments in countries with typically low tax rates (see Singapore, Hong Kong, Bermuda, and Ireland in figure 2).

Regarding the TCJA's impact on foreign investment in routine tangible assets, Beyer et al. (2023) report an increase in foreign capital expenditures, specifically among companies likely to have a residual GILTI tax, but no changes in domestic capital expenditures.

Chodorow-Reich et al. (2023) evaluate the TCJA and its impact on investment domestically and internationally. They develop a cost of capital model and calibrate it using firm-level confidential data from the IRS. Because the authors have access to corporate tax returns, they can identify real outcomes at the firm level. They find that the reform created large incentives for US multinationals to increase foreign capital and that foreign investment rose substantially. They argue that the main driver of the decrease in foreign cost of capital post-TCJA was the presence of the 10 percent carve-out for tangible investments. The authors estimate that in the two years following the TCJA, foreign capital increased by 10 to 14 percent for US multinationals that were subject to GILTI tax. Furthermore, the predictions of the long-run general equilibrium model by Chodorow-Reich et al. (2023) suggest that the GILTI regime increases capital by about 1.5 percent.

But other research has found different outcomes. Albertus, Glover, and Levine (2022) develop a dynamic model with agency conflicts and a stochastic tax reform. They apply data on foreign investment by US multinationals and estimate that the TCJA reduced foreign investment by 15.6 percent. The authors find that the worldwide tax system with deferral and a high corporate income tax rate in the US incentivized foreign investment and that bringing back foreign cash post-TCJA was unlikely to increase domestic investment because US multinationals are unlikely to be financially constrained.

Samuel (2022) looks at investments made by foreign subsidiaries of US companies. He compares investments before and after the TCJA between US-owned subsidiaries and foreign-owned subsidiaries using a difference-in-difference design. He finds that capital investment decreased by 13.1 percent for subsidiaries of US multinationals compared with other subsidiaries. Labor in US-owned subsidiaries was slightly lower (–1.3 percent) relative to foreign-owned subsidiaries, while productivity increased. But he also finds that US subsidiaries invest more overall and that investment in capital rose, on average, after the TCJA.

Samuel uses the Orbis database for his analysis, which does not include all companies and tends to underreport income from tax havens. However, income generated from investments in tax havens is less likely to be shifted to another jurisdiction than income generated in a high-tax country. In addition, the cost of deferral is likely higher in tax havens, where large US multinationals would retain a sizeable fraction of their foreign earnings, and lower in high-tax countries, where they would have more access to capital.

Our takeaway from Samuel (2022) is that US multinationals invested more abroad after the TCJA but less than affiliates of foreign multinationals. This average estimated parameter combines responses of US multinationals with and without residual GILTI liability, highlighting the range of responses. Overall, differences in method, data, and scope of US multinationals included in each study can explain the somewhat different conclusions.

Profit-shifting incentives

We investigate optimal profit shifting in our model when shifting income is costly and assume a quadratic shifting cost—according to Hines and Rice (1994). We assume that shifting costs are not tax deductible. From the present value of income generated for a given investment with specified parameters, we can derive an optimal amount of shifting (see technical appendix for derivations and assumptions).

Figure 3 reports the optimal percentage of profit shifted, based on the shifting cost parameter a, for investment in equipment and machinery financed with equity. Assuming that the investment is in Germany, the deferral cost is 5 percent and shifted income is subject to a 5 percent tax rate in a low-tax country.[15] When the shifting cost is zero or low, it is irrelevant, and corporations shift the amount of income that reduces taxes to zero in the country of investment and maximize after-tax income. The optimal share shifted is less than 100 percent because the corporation can take deductions in the country of investment. When the cost becomes high enough, the optimal amount shifted decreases rapidly and then flattens out, because of the quadratic

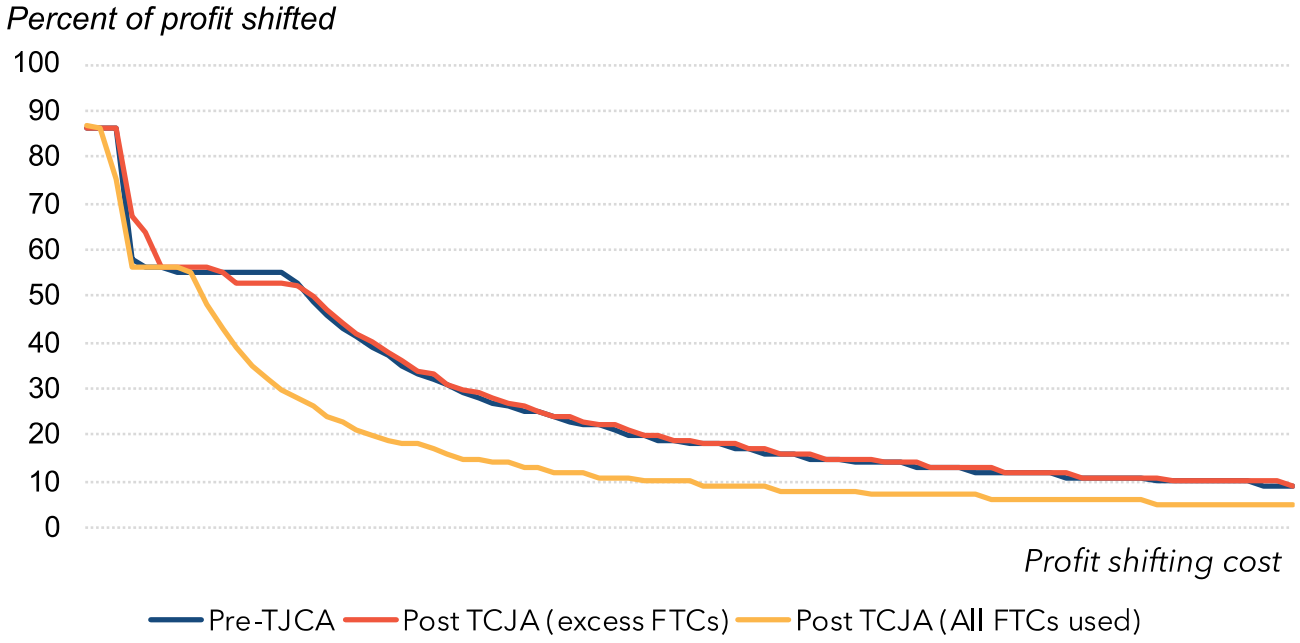
properties of the cost function. When shifting costs are zero, the optimal amount shifted before the TCJA is larger.

Before the TCJA, the marginal benefit of shifting consists of lower combined foreign taxes and cost of deferral in the country of investment, while the marginal cost of shifting is the combination of the shifting costs and the additional taxes and cost of deferral in the low-tax country. After the TCJA, if a firm starts with excess foreign tax credits, the marginal benefit of shifting comes from the reduction in foreign taxes and a lower GILTI tax liability in the country of investment. The marginal cost of shifting is the combination of the shifting costs and the new foreign tax and GILTI tax liability in the country where profit is shifted. Assuming that the reduction in the GILTI liability in the country of investment is equal to the new GILTI liability generated, a company will shift profit until the reduction in foreign taxes is larger than the shifting cost. It follows that optimal profit-shifting was mostly similar after the TCJA for firms with excess foreign tax credits.[16]

However, when a firm starts with a residual GILTI liability, and assuming they can use all the foreign tax credits generated, the marginal benefit of shifting income is reduced to the 20 percent of foreign taxes that are disallowed as foreign tax credits. When costs are low, there is little to no differences in optimal profit shifting compared to firms that have excess foreign tax credits. But as the cost of shifting profit grows, the optimal amount for firms that can use all their foreign tax credits is smaller.

FIGURE 3

Optimal Profit Shifting of Income from New Investment



Source: Author's calculations.
Notes: The optimal share of income shifted is the amount that maximizes the net present value of an investment in tangible assets (50 percent building and 50 percent equipment). We assume the new investment is in Germany.

The main takeaway of this analysis is that optimal profit shifting for new investments depends on the firm's starting GILTI liability and foreign tax credits and that the structure of the GILTI regime maintains high incentives to shift profits, especially when marginal shifting costs are small. Our findings align with Clausing (2020b), who argues that profit-shifting incentives across foreign affiliates of US multinationals depend on whether the parent company has excess foreign tax credits or a residual GILTI liability. Companies with excess foreign tax credits have similar incentives to shift profit as before the TCJA, only without the fear of repatriation taxes. Companies with residual GILTI liability shift less profit, because they can use a large fraction of foreign taxes paid as credits.

In addition, this analysis applies to the shifting of additional income. Whether US multinationals change the amount of profit they shift depends on the overall cost structure and future expectations. There is no data on the number of US multinationals with residual GILTI liability, but Clausing (2020b) suggests that about half of the income abroad is held by companies in an excess credit position and about half by companies with residual GILTI liability.

And even when assuming that, on average, multinationals should optimally shift less income after the TCJA, it would likely take a long time for the overall profit shifting to decline. Atwood and Johnson (2021) found that in the two years after the TCJA, US multinationals increased income shifted to foreign sources and that the GILTI provisions did not curb profit shifting. Garcia-Bernardo, Janský, and Zucman (2022) find that some US companies, especially in the technology sector, repatriated intellectual property to the US, which led to a lower share of total profits generated abroad. However, they also find that the share of non-US profit held in low-tax jurisdictions had not changed by 2020, remaining at around 50 percent.

This suggests that the TCJA successfully lowered profit shifting out of the US, while its impact on profit shifting was mixed and likely small across foreign affiliates.

CONCLUSION

The TCJA completely overhauled how the US taxes foreign income. The TPC's new Investment and Capital Model now generates forward-looking effective average and marginal tax rates on foreign investment by US multinationals that incorporate both US and foreign taxes. The model can take into consideration firm-specific characteristics, like the cost of deferring repatriation before the TCJA, whether a firm has residual foreign tax credits or a GILTI tax liability, how much of generated income is shifted to tax havens, and the type of investment and method of finance.

Our findings suggest that the TCJA lowered the tax burden on foreign investments for most firms, with only companies with both low deferral costs and aggressive profit-shifting seeing an increase in the tax burden. Companies with high costs of deferral and little-to-no profit shifting saw the largest gains, with a decrease in tax burden on foreign investments between 10 to 15 percentage points. For those firms, the

impact across countries varies substantially. Firms that shifted profit aggressively—i.e., at least 50 percent of income generated from new investments is shifted—and had average or high costs of deferral still benefit from a lower tax burden on investments. But the differences are more muted across countries.

We leverage our model to estimate optimal profit-shifting before and after the TCJA and find that incentives to shift profits on new investments remain high for several reasons. Multinationals have strong incentives to shift profit to lower their foreign tax burden in the country of investment. The GILTI minimum tax rate of 10.5 percent is low compared with the statutory tax rate of most countries, and it is calculated on pooled foreign income rather than at the jurisdiction. After applying foreign tax credits, only companies that invest in very low-taxed jurisdictions, benefit from targeted tax incentives that lower their tax burden, or shift profit aggressively have a residual GILTI tax liability.

Our theoretical findings align with empirical research of the TCJA's on US multinationals. Many studies show an increase in foreign investment for a subsample of firms, specifically in capital expenditures that also lower their GILTI liability. The literature also points out that profit-shifting by US multinationals has remained the same as before 2018, or decreased slightly, and the decline is often attributed to a handful of large firms that took advantage of specific incentives like the FDII deduction.

Although the TCJA was successful at removing perverse incentives of the previous tax system like deferral, the current system remains complex and the minimum GILTI tax was largely unsuccessful at changing profit-shifting incentives.

TECHNICAL APPENDIX

Modeling the tax burden before the TCJA

In the effective tax rate framework, it is advantageous to represent the cost of deferral as an added tax rate on foreign income. To get an idea of the approximate size of deferral costs, we leverage data on firms that repatriate income during tax holidays. Let us define the US tax burden on foreign income before the TCJA as $T^{defer} = \alpha(\tau^{US} - \tau^{F})Y^{F} + c$, where Y^{F} is foreign income, α is the value of deferral for the company, and c is other costs incurred when a company chooses to defer. When a multinational expects to never repatriate income, deferral creates no financial frictions or misallocation of capital, $\alpha = 0$, and only foreign taxes matter. The multinationals with access to cheap financing and a high discount rate would likely have a small α. During a tax holiday, such as the American Job Creation Act of 2004, corporations have the option to repatriate income at a lower rate and receive a lower foreign tax credit (FTC). For example, in 2005, multinationals could have repatriated foreign income at 15 percent of the then tax rate and use 15 percent of foreign tax credits on repatriated income. The US tax burden upon repatriation would have been $T^{repat} = \beta * (\tau^{US} - \tau^{F})Y^{F}$, where $\beta = 0.15$. This means a firm should repatriate only when $T^{repat} \leq T^{defer}$. To simplify the exercise, we assume that the administrative cost can be expressed as a percentage of foreign income, $c = \gamma Y^{F}$. Setting $T^{repat} = T^{defer}$ allows us to find the minimum deferral costs for companies that repatriate income and implies that $\beta = \alpha + \frac{\gamma}{\tau^{US} - \tau^{F}}$.

To map the cost of deferral into a tax rate equivalent, we express the total tax burden as $T^{tot} = (\tau^{F} + d)Y^{F}$. To calibrate d, we assume $T^{tot} = T^{repat} = T^{defer}$, which implies $d = \beta(\tau^{US} - \tau^{F}) = \alpha(\tau^{US} - \tau^{F}) + \gamma$. To find a value for the implied cost of deferral d, we need to know the foreign tax rate paid on foreign income and assumptions on α or γ. Kleinbard and Driessen (2008) find that during the 2005 tax holiday, FTCs made up about 30 percent of US tax liability. This implies an average foreign tax rate of 10.5 percent (35% * 0.3). If $\gamma = 0.01$ (1 percent administrative cost), then $\alpha = \beta - \frac{\gamma}{0.245} = 0.109$. This means that in 2005, the cost of deferral would have been equivalent to 10.9 percent of the gap between the US rate (35 percent) and the average foreign rate. A corporation with an average tax rate of 25 percent would have a deferral cost of 2.1 percent (0.109 * 0.1 + 0.01), and a corporation with an average tax rate of 5 percent would have a deferral cost of 4.3 percent (0.109 * 0.25 + 0.01).

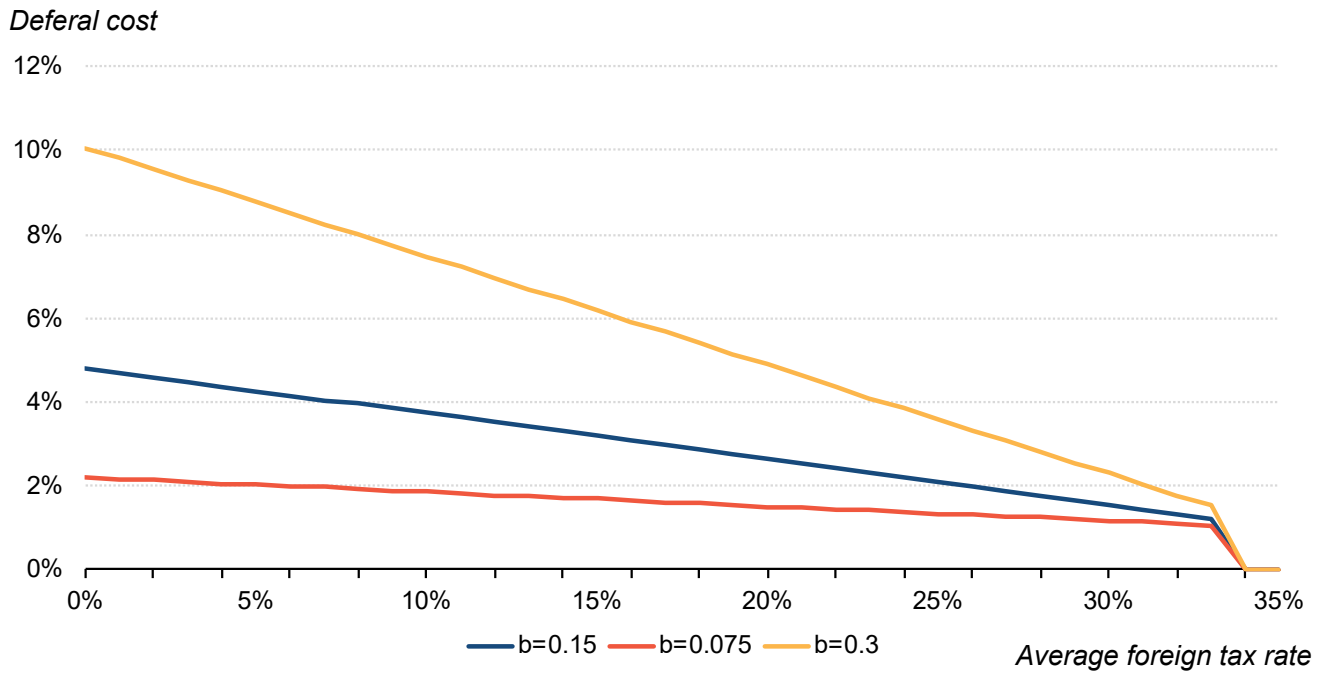
Figure A1 shows the minimum implied deferral tax rate for firms that choose to repatriate during a tax holiday for a given discount on repatriated income (β), assuming $\gamma = 1\%$. The implied deferral cost decreases as the foreign tax rate increases and converges to zero when the foreign tax rate is equal or higher than the US tax rate. The higher the threshold for repatriation (β), the larger the implied deferral costs. On the one hand, assuming a larger administrative cost (γ) would flatten the slopes, lower the maximum deferral cost, and increase the minimum deferral cost. On the other hand, if administrative costs were negligible, the implied

cost of deferral would simply be $\beta(\tau^{US} - \tau^{F})$. The minimum implied deferral cost decreases with the foreign tax rate because the FTCs reduce the fraction of income that would be taxed upon repatriation. Across firms that repatriate income, some will have deferral costs higher than what we estimate.

FIGURE A1

Implied Deferral Cost on Repatriated Income during a Tax Holiday

With administrative costs of 1 percent ($\gamma = 1\%$)



Source: Author's calculations.
Notes: Implied deferral cost on repatriated income during tax holidays. The value *b* represents the fraction of the regular corporate income tax due on repatriated income.

Modeling the tax burden under GILTI

The GILTI regime has key characteristics that corporations implement to derive EATRs and EMTRs. Several important steps determine the GILTI liability. First, a company calculates, in each CFC, the net tested foreign income equal to foreign income net of deductions and foreign taxes. Then the company subtracts the Qualified Business Asset Investment (QBAI) deduction by controlled foreign corporations to find the initial GILTI tax base. The GILTI regulations require companies to gross up the GILTI tax base by the amount of deemed foreign taxes paid, which can be found by multiplying the inclusion percentage with the foreign taxes paid. The inclusion percentage represents the fraction of the initial GILTI tax base in tested foreign income: $inc = \frac{NTI - QBAI}{NTI} = 1 - \frac{QBAI}{NTI}$, where net tested income ($NTI = Y^{F}[1 - \tau^{F}]$) is equal to foreign income net of depreciation, expenses, and foreign taxes. The final GILTI tax base is $GILTI = Y^{F} - QBAI + inc * \tau^{F} Y^{F}$, which can be simplified to $GILTI = Y^{F}(1 + \tau^{F}) - \frac{QBAI}{(1-\tau^{F})}$. Higher foreign taxes lower foreign income net of taxes and the inclusion percentage. For investment in intangible assets, the inclusion percentage is 1 and GILTI income is

simply net foreign income before foreign tax (Y^F). The GILTI regime allows corporations to use FTCs against their GILTI liability, but FTCs are limited to 80 percent of deemed foreign taxes paid, which are equal to the amount of foreign taxes grossed up in the GILTI tax base. So, it follows that the allowed FTC is $0.8 * inc * \tau^F * Y^F$.

In the model, we normalize the new investment to 1 and the QBAI deduction to simply 0.1. When an investment is debt-financed, the QBAI is reduced by the amount of interest expenses. We assume that companies borrow at nominal rate i, and the QBAI for debt-financed investment is $0.1 - \hat{f}$, where $\hat{f}$ represents the financing cost for debt-financed investments. Using Devereux and Griffith methodology (2003), $\hat{f} = (1 - \phi\tau^{GILTI}) * i\tau^{GILTI}/(1+i)$, where ϕ is a fraction for allowed depreciation in the first year. Abstracting from foreign taxes, it is straightforward to compute the net present value of an investment subject to GILTI. The EATR for equity-financed machinery is 7.4 percent and 6.1 percent for buildings. However, because interest costs are deducted from the QBAI deduction, debt finance only slightly reduces EATRs to 6.6 percent for machinery and 5.8 percent for buildings.

Profit shifting

An important rationale behind the GILTI minimum tax on foreign income was to limit profit-shifting incentives created by moving to a territorial tax system. In addition, the TCJA cut domestic corporate tax revenue, and GILTI was expected to raise new revenues on profits reported by foreign subsidiaries in low-tax jurisdictions. The GILTI regime—combined with the BEAT, expensing of domestic capital investment, and a lower corporate income tax rate—reduced incentives to shift profit from US parent companies to foreign affiliates (and shift income out of the US by domestic affiliates of foreign multinationals). The GILTI tax also potentially created fewer incentives to shift profit across foreign affiliates. However, the "pooling" feature of the GILTI regime, which allows a parent company to pool foreign income and FTCs when determining its total GILTI tax liability, maintained the value of profit shifting for many US multinationals. We incorporate profit shifting in our effective tax rate methodology to highlight how profit shifting impacts EATRs and EMTRs.

Before the TCJA, the net present value of a new investment with profit shifting is:

$$R^{PreTCJA} = -\frac{r+\delta}{1+r}(1-A) + \frac{(p+\delta)}{1+r}[\zeta(1-\tilde{\tau}^{LT}) + (1-\zeta)(1-\tilde{\tau}^{HT})] + \frac{d'\delta}{1+r} - \frac{\eta}{1+r} + F \quad (1)$$

Where $\tilde{\tau}^{LT}$ and $\tilde{\tau}^{HT}$ represent the tax rates in high-tax and low-tax countries, which include the cost of deferral. The parameter $\frac{d'\delta}{1+r}$ is added because we assume that only the share of income that represents pure profit (p) is deferred. F is a financing term, which is zero for investments financed with retained earnings. For investments financed with debt, $F = dB_t\left[1 - \frac{1+i(1-\tau)}{(1+i)}\right]$, where dB_t is the amount of bonds issued, which is equal to the cost of investment net of the value of first-year depreciation deductions ($1 - \phi\tau$). We assume that corporations can fully deduct interest expenses from taxable income. However, many countries have thin capitalization rules that

limit the amount of allowed interest deductions and lower the value of F. We ignore this issue because we do not have data on the average share of allowed interest deductions by country and because the value of F to determine foreign taxes is not affected by the TCJA. We later present some outcomes that include debt-financed investments, but our focus is on equity finance, which is the most common source of financing of foreign investments by multinationals. Variable A is the present value of the tax benefits of depreciation, r is the real interest rate, ζ is the share of profit shifted, and η represents shifting costs.

After the TCJA, there is no deferral cost, but the company now faces both the foreign tax liability and the GILTI tax. So, the present value of an investment becomes:

$$R^{postTCJA} = -\frac{r+\delta}{1+r}\left(1-\tilde{A}\right)+\frac{p^{HT}+\delta}{1+r}(1-\tilde{\tau}-\tau^{G})+\frac{0.1-\hat{f}}{(1+r)(1-\tau^{F})}\tau^{GILTI}$$
$$+\frac{p^{HT}+\delta}{1+r}[(1-\zeta)*0.8x*\tau^{HT}+\ \zeta*0.8*\tau^{LT}]-\frac{\eta}{1+r}+F^{G}+\ (1-0.8x)F^{HT} \qquad (2)$$

Where $\tilde{A}=\hat{A}^{G}+A^{F}(1-0.8x)$ combines the present value of tax depreciation, x represents the inclusion percentage that determines FTCs (when financed with equity, $x=1-\frac{0.1}{(1-\zeta)(r+\delta-\phi)}$), the composite tax rate is $1-\tilde{\tau}=\zeta(1-\tau^{LT})+(1-\zeta)(1-\ \tau^{HT})$, τ^{GILTI} is the applicable GILTI rate of 10.5 percent, the fraction of allowed FTCs is $0.8*x$ in a high-tax country and 0.8 in a low-tax country, and shifting costs are captured by η. This specification assumes that all new FTCs generated can be used by the company, which would apply when it has a residual GILTI liability after the investment. However, some companies will not be able to use the entire new FTCs. In that case, we compute the ratio $s=\frac{GILTI\ liability}{New\ FTC}$, which captures the fraction of new FTC used by the company, and estimate equation (2), where the fraction of allowed FTCs in a high-tax country is $s*0.8*x$.

We investigate optimal profit shifting in our model when shifting income is costly and assume a quadratic shifting cost—according to Hines and Rice (1994), where the cost of profit shifting depends on the share of profit shifted out of the country of investment—on the amount of local capital (K) and on the cost parameter a: $\eta=\frac{aK}{2}*\left(\pi-\frac{f(K)}{K}\right)^{2}$, where a represents the cost of income shifting for a given amount of true profit reported, π is the amount of profit reported in the country of investment, and $f(K)$ represents income generated by the new investment. Compliance and administrative costs impact the value of a. In our context, we make the simplifying assumption that costs and income depend only on the new investments $f(I)=f(K)$, which is normalized to 1 ($I=1$). The amount of profit shifted (ζ) is a fraction of true earned income, and reported profit is equal to $(1-\zeta)*f(K)$. It follows that the cost function in our model is $\eta=\frac{a}{2}*\zeta^{2}*f(I)^{2}$, where $f(I)$ is the income generated by a new investment. We assume that shifting costs are not tax deductible. From the present value of income generated for a given investment with specified parameters, we can derive an optimal

amount of shifting. We cannot solve for the optimal amount of profit shifted (ζ) in $R^{postTCJA}$, so numerically find the value of ζ that maximizes income using equation (2).

NOTES

[1] In 2021, as classified by the Bureau of Economic Analysis, the largest 10 jurisdictions were (in the order of total foreign direct investments): United Kingdom, the Netherlands, Luxembourg, Ireland, Canada, United Kingdom Islands (e.g., tax havens like Cayman Islands and the British Virgin Islands), Singapore, Bermuda, Switzerland, and Germany.

[2] The seven tax havens are: the Netherlands, Luxembourg, Ireland, United Kingdom Islands, Singapore, Bermuda, and Switzerland. Researchers have argued that the Bureau of Economic Analysis foreign direct investment data are subject to double counting, which may overestimate profit shifting. The numbers are not adjusted for potential double counting and are used to illustrate the distribution of foreign income abroad.

[3] Multinationals often have multilayered structures, where CFCs of a US multinational own other CFCs. For example, a US parent company that owns an Irish subsidiary may itself own a French subsidiary. Blouin and Robinson (2020) argue that double counting occurs because companies report profits on the Bureau of Economic Analysis surveys according to where they originate in their CFCs—that is, where sales occur, such as the French CFC in this example—and in the CFC where they receive the profits as dividends (the Irish CFC). The profit reported in Ireland may be assumed to be profit shifted, when it is dividends received by a subsidiary.

[4] Tax Policy Center, "Briefing Book: A Citizen's Guide to the Fascinating (though Often Complex) Elements of the US Tax System," updated May 20202, https://www.taxpolicycenter.org/briefing-book/what-global-intangible-low-taxed-income-and-how-it-taxed-under-tcja.

[5] Affiliates with net tested loss cannot claim the QBAI exemption when computing their GILTI.

[6] In this example, the inclusion percentage would be equal to 50/60 (83.3 percent), the grossed up GILTI would be $64.17 million ($60 million + 5 * 83.3%), and the net GILTI tax base would be $54.17 million. The GILTI tax liability would be $5.7 million, and FTCs would be $3.3 million (5 * 80% * 83.3%).

[7] Tax Policy Center, "Briefing Book."

[8] A patent box regime, also called an IP regime, allows income generated from intangible assets to be taxed at a lower rate. For a list of examples, see "Intellectual Property Regimes," Organisation for Economic Co-operation and Development, accessed March 4, 2024, https://qdd.oecd.org/data/IP_Regimes. The impact of FDII on effective tax rate is described in Brosy and Matheson (2023).

[9] "26 U.S. Code § 250 – Foreign-Derived Intangible Income and Global Intangible Low-Taxed Income," Legal Information Institute at Cornell Law School, accessed March 4, 2024, https://www.law.cornell.edu/uscode/text/26/250. The regular corporate income tax rate is 21 percent: 21% * (1 – 0.375) = 13.125%; 21% * (1 – 0.21875) = 16.4%.

[10] As a reminder, Devereux and Griffith's methodology (2003) defines EATR as the wedge between the net present value of earnings generated by an investment absent taxes and with taxes, scaled by the present value of pretax capital income: $EATR = \frac{R^* - R}{p/(1+r)}$, where R^* is the present value of pretax income and R is the present value of after-tax income generated by a new investment.

[11] Desai, Foley, and Hines (2001) show that dividends increase when the repatriation tax is lower, suggesting that tax-avoidance strategies and deferral are costly. If deferral were costless, there would never be any repatriation with a nonzero tax.

[12] To find a value for the implied cost of deferral d, we need to know the foreign tax rate paid on foreign income and assumptions on parameters defining the cost of deferral. Kleinbard and Driessen (2008) find that during the 2005 tax holiday, foreign tax credits made up about 30 percent of US tax liability. This implies an average foreign tax rate of 10.5 percent (35% * 0.3). With a 1 percent administrative cost, it follows that a corporation with an average tax rate of 25 percent would have a deferral cost of 2.1 percent and a corporation with an average tax rate of 5 percent would have a deferral cost of 4.3 percent (see appendix for details). In 2005, few firms chose to take advantage of the tax holiday, but they were large. Redmiles (2008) shows that only 7 percent of US firms that reported having foreign affiliates on their tax returns repatriated income in 2005. Blouin and Krull (2009) looked at all listed public firms in the Compustat database and find that 13 percent of firms repatriated income by 2005; but they tend to be much larger

firms. Weighting the number of firms by their worldwide assets shows that almost 50 percent of firms chose to repatriate. If all the firms were the same size, about half would have deferral cost above what we estimate and the other half below our estimate.

[13] See Brosy (2024) for a discussion of the impact on TCJA for firms with no deferral cost or a 10 percent deferral cost.

[14] Some countries changed their tax rate or depreciation system between 2017 and 2020, so we derive EATRs pre- and post-TCJA based on foreign tax regimes in 2019.

[15] We also estimated optimal profit shifting for other large economies where US multinationals have a strong presence like France, Japan or Canada, and the outcomes are qualitatively similar. We estimated optimal profit shifting when the low tax country has a higher statutory tax rate (e.g., 5 percent), and find similar outcomes.

[16] Although the benefits are linear, the cost function is quadratic, and the various elements enter the EATR function to define optimal profit shifting, which is not linear. It follows that in for a small range of shifting costs, optimal profit-shifting was slightly lower after the TCJA, for firms that have excess foreign tax credits.

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ABOUT THE AUTHOR

Thomas Brosy is a senior research associate at the Urban-Brookings Tax Policy Center. He studies business and international taxation, as well as state and local taxes. Brosy works extensively on business tax modeling. His research and writing have covered the impact of state taxation on business dynamism, bonus depreciation, Pillar 1 and 2, the book minimum tax, the buyback excise tax, the relationship between property values and property taxes, commercial property taxes, and federal business and international US tax reforms. Brosy holds a PhD in economics from the University of Michigan, an MS in economics from the University College London, and a BS in economics from the University of Lausanne, Switzerland.

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