Profit Shifting Before and After the Tax Cuts and Jobs Act

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Abstract: In recent years, profit shifting by multinational companies has generated substantial revenue costs to the U.S. government. The Tax Cuts and Jobs Act (TCJA) changed the climate for profit shifting in several important ways: the lower U.S. corporate rate should lower the incentive to shift profits away from the United States, while "territorial" tax treatment (of some income) and the removal of tax upon repatriation should raise the incentive to shift profits abroad. In addition, two novel base protection measures, the GILTI and the BEAT, aim to reduce profit shifting. This paper discusses tax law changes under the TCJA, considering the nature of their effects on profit shifting. The paper also evaluates the effects of the global minimum tax (GILTI) on the location of taxable profits. Once adjustment to the legislation is complete, estimates suggest that the GILTI should reduce the corporate profits of U.S. multinational affiliates in haven countries by about 12 to 16 percent, modestly increasing the tax base in both the United States and in higher-tax foreign countries. Of note, positive U.S. tax base effects would be far greater from a per-country minimum tax; a per-country tax at the same rate reduces haven profits by 23 to 31 percent, resulting in larger US revenue increases.

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I. Introduction

Public Law 115-97, typically referred to as the Tax Cuts and Jobs Act, generated the most sweeping U.S. corporate tax policy changes since 1986. The statutory corporate tax rate was lowered from 35 to 21 percent, and three new international provisions (GILTI, FDII, and BEAT), largely untested elsewhere, changed the tax treatment of multinational company income.[1] The United States also changed the label of its tax system from "worldwide" to "territorial" by exempting foreign income from taxation.

Still, in international tax, labels can be deceiving.[2] Most countries lie on a spectrum between a "pure worldwide" system and a "pure territorial" system, and the United States is no exception, then or now. Under the prior (purportedly worldwide) system, very little tax was collected on foreign income, and tax on foreign income was not levied until repatriation. Under the current (purportedly territorial) system, some tax on foreign income is collected currently through a global minimum tax.[3] In some respects the present system has more worldwide reach than the prior system.[4]

The sweeping nature of these corporate tax provisions makes forecasting their effects difficult. The U.S. Joint Committee on Taxation (JCT) estimated that the rate cut would dramatically reduce U.S. government revenues, even after base-broadening provisions were accounted for, by over $650 billion in the coming decade. International provisions also lost revenue, but much more modestly ($14 billion over ten years), because some provisions raise

[1] GILTI stands for Global Intangible Low-Taxed Income, FDII stands for Foreign-Derived Intangible Income, and BEAT stands for Base Erosion and Anti-Abuse Tax.
[2] For a longer discussion of the distinction between label and reality in international tax, see Clausing (2016b).
[3] Subpart F income triggers current taxation under both prior and present law.
[4] Particular company circumstances will determine whether the new system has a greater or lesser worldwide reach than the prior system.

revenue (GILTI and BEAT) while others lose revenue (territoriality and FDII).[5] Taking the committee's estimates at face value, they imply that the international provisions, on net, do not improve upon the status quo in terms of reducing the substantial revenue costs of profit shifting. Estimates in Clausing (2016, 2020b) indicate that revenue costs from profit shifting may exceed $100 billion per year by the time of the legislation; these estimates are broadly consistent with findings of other authors as well as JCT estimates of the cost of deferral.[6]

The following analysis begins by considering the revenue costs of profit shifting, focusing primarily on the activities of U.S. multinational companies as those are the companies most affected by the tax law change. Then, I consider the impact of the provisions of the TCJA on profit shifting incentives. While the direction of the impact of each provision is clear, some provisions are difficult to model precisely. In my empirical analysis, I focus on the effects the global minimum tax (GILTI), analyzing its impact on the corporate tax base in the United States and abroad. I estimate that this provision will reduce profit shifting, lowering the U.S. affiliate corporate tax base in haven countries by about 12 to 16 percent in the steady-state equilibrium. Foreign corporate tax revenues in non-haven countries are also buttressed by the global nature of the minimum tax, which lowers the tax sensitivity of some U.S. multinational companies to foreign tax rates.

However, the global nature of the minimum tax, in comparison to a per-country minimum tax, substantially reduces its impact. Indeed, the global nature of the minimum tax makes the U.S. the *least* desirable place to book income for many multinational companies,

[5] There is also a one-time deemed repatriation tax on prior earnings. This represents a tax break in comparison to prior law, but it raises over $300 billion in the ten-year window. Because it is a one- time tax on earnings that have already occurred, it is ignored in the subsequent analysis.

[6] See, e.g., Guvenen et al. (2018), OECD (2015), Zucman (2015), and JCT (2014). This literature, and related controversies about the scale of profit shifting, are discussed in more detail in Clausing (2020b) and in Appendix A.

because if they do not have sufficient foreign tax credits to offset minimum tax due, even high-taxed foreign income is preferable to U.S. income when foreign tax credits shield haven income from the GILTI tax. In contrast, under a per-country minimum tax, reductions in haven tax bases would be about twice as large, and U.S. revenue gains from the minimum tax would be more than two and a half times higher.

In the short run, the effects of the TCJA on profit shifting will be smaller, as companies will gradually adjust to the diminished incentive to shift profits abroad. Indeed, as of the third quarter of 2019, there is no evidence of a reduction in profit shifting or a change in the location of US MNC profits. This may be due to the conflicting nature of the international provisions of the TCJA, which together have ambiguous effects on the incentive to shift profits offshore. In addition, the details of implementing regulations are likely to be important. With time, the complete effects will become clearer. Yet even as these effects are sorted out, other countries' policies, and multinational companies, will not stand still. Neither profit shifting, nor corporate tax competition, will end with the TCJA.[7]

II. Background

There are many prior studies on profit shifting, and good reviews are provided in Clausing (2016a), Dowd, Landefeld, and Moore (2017), and OECD (2015), with more recent studies discussed in Clausing (2020b) and in Appendix A below.[8] One grave difficulty in prior work is data quality. Some of the best databases in terms of company coverage and detail are financial reporting databases such as Orbis, yet these are missing tax haven observations,

[7] While the competitive response of other countries is beyond the scope of this paper, it is a useful area for future research. Early work on this topic includes Beer, Klemm, and Matheson. (2018).
[8] The OECD overview of this issue is particularly comprehensive.

substantially reducing their usefulness.[9] As subsequent analysis shows, the vast majority of profit shifting occurs with respect to haven countries, so studies that rely on Orbis data are likely providing substantial underestimates of the profit shifting problem.

Tax data are often not available to researchers outside the tax authorities, although that is slowly changing in the United States and elsewhere. In this analysis, I rely on several sources of data: survey data from the U.S. Bureau of Economic Analysis (BEA), BEA direct investment income data from the Balance of Payments, and new Country by Country tax reports from the IRS, a full set of which was just released in December 2019.

While there have been some concerns discussed in the recent literature about double-counting in these data, the BEA series used below do not have any double-counting problems. In addition, a comparison of the total profits in the 2017 Country by Country data with those reported from other sources indicates that double counting is unlikely to be a substantial problem in these data, especially since I omit the "stateless income" observation, due to current ambiguities in interpretation.[10] These data sources are discussed in far more detail in Appendix A.

Studies of the TCJA are relatively speculative at this point, and to my knowledge, there is not yet substantial work estimating how the legislation will affect profit shifting.[11] Dharmapala (2018) has considered the likely consequence of the law on the tax burdens on foreign income faced by U.S. multinational companies. Drawing on prior research, he finds that the legislation is

[9] This problem is documented by Tørsløv, Wier, and Zucman (2018) and discussed by OECD (2015), Dowd, Landefeld, and Moore (2017), and Clausing (2016a, 2020b). For example, Tørsløv, Wier, and Zucman (2018) report that $55.3 billion in consolidated profits are reported by Apple in 2016 in the Orbis dataset, yet only $2.0 billion show up in the subsidiary data in Orbis. Similarly large amounts of haven income are missing for other multinational companies.

[10] Appendix A discusses the strengths and weaknesses of all data series in detail. See footnote 55 for a full discussion of the possibility of double-counting in these data.

[11] There are good general analyses of the legislation provided by Slemrod (2018), Auerbach (2018), Beyer et al. (2019), and Hanlon, Hoopes, and Slemrod (2019), but these papers do not address the international provisions.

likely to raise the tax burden on foreign income for many multinational companies. Horst (2019) has done a preliminary analysis of admittedly incomplete company financial reporting in the wake of the law; he finds that the international provisions are likely to raise less revenue than JCT estimated, and the Congressional Budget Office (2020) has recently revised downward their revenue estimates from the international provisions. There have also been some early analyses of possible effects on other countries, in Spengel et al. (2018) and Beer, Klemm, and Matheson (2018). Both of these studies focus primarily on the U.S. statutory rate change, rather than that the international provisions of the law.

III. Profit Shifting Before Public Law 115-97 (TCJA)

Under prior law, the U.S. had a purportedly "worldwide" tax system. Foreign income was taxable in the United States, with tax credits provided for foreign taxes paid to avoid double taxation. Still, there were caveats to the worldwide treatment. Tax was not due until repatriation, and cross-crediting was allowed, such that excess credits from high-tax countries could be used to offset U.S. tax due on income from low-tax countries. As time went by, lower corporate tax rates abroad left fewer U.S. multinational companies with excess credits. Companies were often reluctant to repatriate foreign income, due to the nagging suspicion that a better deal was to be had in the future, in comparison with paying the full U.S. rate. This suspicion was only fueled by a temporary tax holiday on repatriated earnings (with a repatriation tax rate of 5.25 percent), offered as part of the American Jobs Creation Act of 2004. In the end, the U.S. government raised very little, if any, revenue by taxing foreign income, because foreign tax credits offset

income that would have otherwise been taxable (e.g., royalty income), and companies were reluctant to repatriate without holidays or offsetting tax credits.[12]

Under this system, deferral provided a large incentive to shift profits to havens offshore, where they would be taxed more lightly and might ultimately receive favorable treatment upon repatriation. And, regulatory changes in the late 1990s added fuel to the fire, by facilitating the creation of "stateless income", whereby companies created complicated chains of ownership in order to further reduce their worldwide tax obligations, often resulting in income that completely avoided tax altogether.[13]

There is no shortage of casual evidence indicating that profit shifting is a big problem. For example, on the eve of the TCJA, U.S. multinational companies were widely reported to have trillions of dollars in foreign earnings sitting offshore as a result of prior profit shifting activity. 2017 country-by-country data on accumulated earnings offshore show $4.4 trillion in offshore earnings, $2.8 trillion of which was located in just 9 havens (Bermuda, the Caymans, Ireland, Jersey, Luxembourg, Netherlands, Puerto Rico, Singapore, and Switzerland). Indeed, in haven countries such as Bermuda and the Caymans, the annual profits booked by U.S. multinational affiliates are an order of magnitude larger than the entire size of the local economy.[14] And companies themselves were vocal about the difficulty of having their foreign profits "locked out" by fear of repatriation tax, even though those funds were easily borrowed against, creating the equivalent of a tax free repatriation, and were also frequently already invested in U.S. capital markets, providing a source of capital for the larger U.S. economy.[15]

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[12] See, e.g., Altshuler and Grubert (2001).
[13] A detailed treatment of this problem is provided in Kleinbard (2011). See also Mintz and Weichenrieder (2010).
[14] See Gravelle (2015).
[15] A tax free repatriation results when a company borrows (perhaps using foreign cash as collateral) to finance domestic investments. The interest paid is deductible, but the interest earned on the cash abroad is

In prior work, I estimate that profit shifting likely cost the U.S. government at least $77 billion per year by 2012; other non-haven countries also face large revenue costs.[16] In Appendix A, I update these estimates to 2017, making several changes in methodology. First, I focus solely on the behavior of U.S. based multinational firms. This decision focuses on the subset of companies that are most affected by the change in U.S. tax law, and it also focuses on the companies for which we have the best data.

Second, I provide a more sophisticated measure of the share of the profits shifted abroad that truly "belong" to the U.S. Treasury, rather than to foreign government treasuries. In prior work, I assumed that the share of profits that would accrue to the United States (relative to foreign governments) was the same as the ratio of foreign affiliate transactions with U.S. parents, relative to transactions with affiliates in other countries. At the time, I thought affiliate transactions were a useful proxy for the ability to shift profits across bases. However, these transactions themselves are likely distorted by profit shifting incentives.

Therefore, in more recent work, I instead assign shifted profits to countries' tax bases based on a formula that reflects where real economic activities are occurring; this should be a more accurate estimate of where profits would be in a counterfactual world without profit shifting. Recent data suggest that about two-thirds of US MNC economic activity is in the United States, so I assign two-thirds of the excess profits in tax havens to the US tax base.

Third, I have corrected a prior faulty adjustment that I made to the BEA direct investment income series that may have inadvertently inflated the size of the estimates. While the

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taxable. These two tax events cancel if the interest rate is the same, and it is as if the company had access to its offshore earnings.

[16] 2012 was the most recent year with available data when that study was completed. This estimate represents the revenue cost of profit shifting relative to a counterfactual world without profit shifting. Of course, most legislative "solutions" to profit shifting will not completely eliminate profit shifting. This estimate should not be viewed as revenue that would result from any particular legislative proposal.

adjustment was intended to simply include the full amount of US company income, it risked inflating income in the presence of chains of ownership.[17]

Fourth, I now follow three methods of estimation, detailed in detail Appendix A, to show readers a range of possible estimates that rely on different estimation techniques. The first technique simply assigns all havens (defined as countries with effective tax rates below ten percent) the world average profit/employment ratio, and then reallocates the excess haven income to non-haven countries.

The second and third techniques use regression analysis to estimate the tax sensitivity of foreign profits, controlling for the scale of foreign operations (measured by assets, employment, and employee compensation) and country-specific factors (captured by country-specific fixed effects). The tax sensitivity is then removed, resulting in fewer profits in low-tax countries and more profits in high-tax countries. (Any reduction in profits in low-tax countries is capped at existing profit, so overall profits are unchanged.) Within these estimates, I allow for nonlinear elasticities, which are important to include, as persuasively argued by Dowd, Landefeld, and Moore (2017). Nonlinear elasticities fit the data better than linear elasticities, helping to explain the disproportionate clustering of profit in the lowest tax rate countries.[18]

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[17] In particular, I had adjusted the data in order to include all income from US multinational companies, not just the US owned portion of that income reported in the balance of payments data. I used data provided by the US BEA on the foreign ownership share to make this adjustment. However, the adjustment risks inadvertently overestimating the total amount of profits in each country in the presence of chains of ownership, so now I use the data without this adjustment. Therefore, I only capture the US owned share of MNC profit. (For example, if foreign investors own 25% of a US company, I would only include 75% of the company's profit in my sample.) Thus, while the prior method introduced a source of overestimation, this method introduces a source of underestimation.

[18] Dowd, Landefeld and Moore (2017) argue that tax responsiveness is likely to be nonlinear, such that elasticities are highest with respect to haven countries. They employ US tax data, the best possible data for studying this question, finding large elasticities with respect to haven data. Indeed, in my estimations, nonlinear elasticities typically fit the data better than linear ones. This makes intuitive sense. When shifting profits, it is most advantageous to achieve the lowest tax rate possible.

Fifth, I now consider all methods of estimation using four distinct data series. These data series have strengths and weaknesses which are thoroughly discussed in Appendix A. Results are shown in Table 1 below; this table shows the revenue loss to both the United States *and* other non-haven countries due to US MNC profit shifting. As argued above, two-thirds of these totals should be assigned to the U.S. tax base, reflecting the US share of US MNC economic activity. In addition, Table 1 does not include the revenue costs associated with the profit shifting of foreign MNCs. As I argue in Clausing (2020b), those two considerations together imply that the US revenue cost is about 95 percent of the numbers reported in Table 1, if foreign multinational companies engage in a similar degree of profit shifting.[19]

Readers will immediately notice the wide range of estimates, depending on method and data series employed. Given the opaque nature of international tax avoidance, and the wide variety of data sources with important differences in coverage and definitions, this large range is not surprising. Interested readers should consult Appendix A for a full discussion of the relative merits of these approaches.

[19] The profits of foreign multinational companies operating in the United States relative to US multinational companies operating abroad is 39 percent in 2017. This uses the "income without current cost adjustment" series from https://www.bea.gov/international/di1usdbal for US MNC income abroad, and a parallel series from https://www.bea.gov/international/di1fdibal for foreign MNC income. Foreign affiliate income in the United States of $208 billion is compared to US affiliate income abroad of $531 billion. Since both numbers are after-tax, that could justify using a somewhat higher ratio. I estimate the before-tax ratio at 43 percent. Thus, if we scale x by x*(2/3)*1.43, the total number would be about 95.5 percent of the original number.

Table 1: Plausible Indicators of the Magnitude of US MNC Profit Shifting in 2017

	BEA Direct Investment Income Series (balance of payments data; adjusted pre-tax)	BEA Adjusted Income Series (removes equity income from income, using BEA survey data)	IRS Full Country-by-Country Sample (without stateless income)	IRS Average of Full and Positive Profit Country-by-Country Sample (without stateless income)
Assign all havens[20] the world average profit/employee ratio	$79 billion	$61 billion	$96 billion	$118 billion
Remove tax elasticity; reallocate profits, linear elasticity	$75 billion	$67 billion	$96 billion	$122 billion
Remove tax elasticity; reallocate profits, nonlinear elasticity	**$89 billion**	$76 billion	**$109 billion**	**$141 billion**

Note: Table shows the full revenue costs due to the profit shifting of US MNCs to both the United States and other foreign (non-haven) countries, assuming shifted profit would have been taxed at pre-TCJA US tax rates. For comparison, US corporate tax revenues for fiscal year 2017 were about $297 billion, using CBO data.
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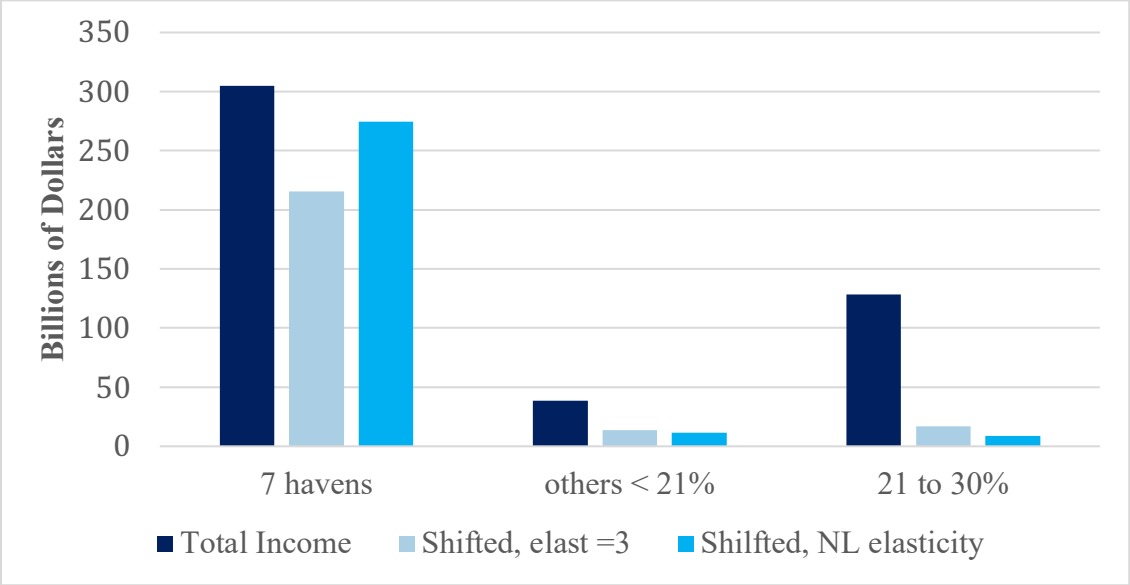
My preferred estimates are those bolded in Table 1; the rationale for that preference is discussed in Appendix A. However, regardless of estimation approach or data set, it is clear that the profit shifting problem is quite large. A salient feature of these data is the bunching of profits, and thus of estimated profit shifting, in the lowest tax countries. Figure 1 shows shifted profits, relative to total profits, using both linear and non-linear elasticities. Panel A uses the BEA direct investment earnings series and Panel B uses the IRS country by country data, which allow for a richer country breakdown due to the inclusion of more than twice as many countries in the analysis. In both datasets, it is apparent that havens account for the vast majority of all profit shifting activity.

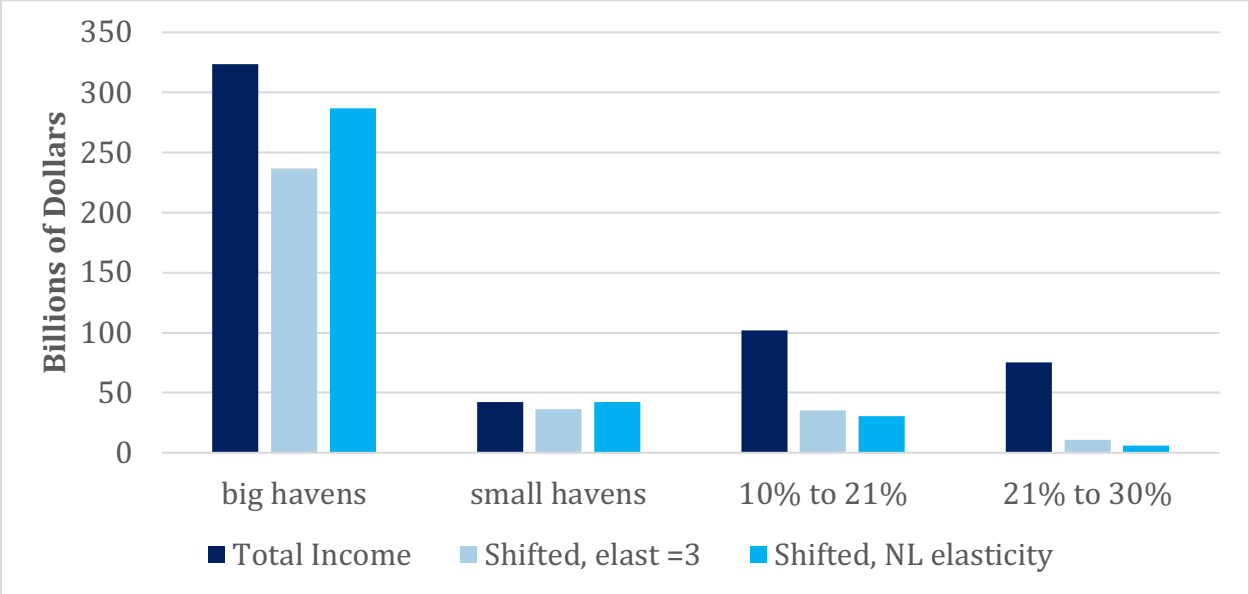
[20] Havens are defined as those countries with effective tax rates less than ten percent.

Figure 1: Distribution of Profits and Shifted Profits

Panel A: BEA Direct Investment Income Series



Panel B: IRS Country by Country Series



Note: Big havens are Bermuda, Caymans, Ireland, Luxembourg, Puerto Rico, Netherlands, Singapore, and Switzerland. Small havens are all other countries with effective tax rates less than 10 percent.

IV. Public Law 115-97 (TCJA) and Profit Shifting

Within the new U.S. tax legislation, there are several important tax law changes that affect profit shifting incentives for U.S. based multinational companies; some of these provisions also affect shifting incentives for foreign multinationals. Table 2 summarizes the main provisions and their likely effects on profit shifting.

The statutory rate cut is dramatic, 14 percentage points, although the effective rate cut is lower than that (10 percentage points) due to several base-broadening provisions in the legislation. JCT calculates that the other business tax provisions reduce the 10-year revenue cost of the corporate tax cut from about $1.3 trillion to about $650 billion. The domestic production deduction is repealed, net operating losses are treated less favorably, research expenditures are amortized beginning in 2023, and debt-financed investments are treated somewhat less favorably.[21] Thus, the overall incentive to earn income in the United States has improved, but not by the full 14 percentage points implied by the statutory rate decrease. In addition, the incentive to locate debt-financed investments in the United States has decreased, as noted by Gravelle and Marples (2018). Further, almost all profit shifting activity occurs with respect to countries with tax rates below the global minimum tax rate (up to 13.125 percent), so it is not clear that a reduction to 21 percent is enough to encourage inbound profit shifting.

[21] Arguably the interest limitations of the business tax provisions will also affect profit shifting, but these effects are not analyzed in this paper.

Table 2: Profit Shifting Incentives Before and After the TCJA

	Before TCJA	After TCJA	Effect on Profit Shifting	10 yr JCT Revenue Score, $b
Statutory Corporate Rate	35	21	Reduced incentive to shift out of U.S. base	-1,349 (net: -654)
Tax Treatment of Foreign Income	No tax until repatriation, then 35 less foreign tax credit[22]	Not taxable unless subject to minimum tax	Increased incentive to shift out of U.S. base	-224
Global Minimum Tax	N/A	0 until threshold, then 10.5; up to 13.125 if blended with income from higher tax countries[23]	Reduced incentive to shift profits to havens; increased incentive to earn in other countries	112
Foreign-Derived Intangible Income Deduction (FDII)	N/A	Tax preference for profits from export sales above threshold	Likely to have negligible effect	-64
Base Erosion and Anti-Abuse Tax (BEAT)	N/A	An add-on minimum tax when payments to foreign related parties exceed threshold	Reduced incentive to shift income out of U.S. base	150

Note: The revenue numbers are from the December 18, 2017 tables provided by the JCT (JCX-67-17).

The TCJA was widely advertised as a move toward a territorial tax system, and indeed, foreign income is typically exempt from taxation, although there are important exceptions. Still, there is no tax triggered by repatriation, so whatever tax benefits are associated with moving income offshore occur without fear of later U.S. tax. Holding other provisions constant, this provision will increase the incentive to shift income out of the United States tax base.

Under prior tax law, tax upon repatriation resulted in a "lock-out" effect, and this lock-out effect may have provided a speed limit on the booking of income offshore. As recognized

[22] Lighter rates may apply, or be anticipated, due to holidays, anticipated holidays, or expectation of future favorable treatment upon transition to a new tax system. Permanently reinvested earnings are not taxed in the United States, but might be expected to encounter deemed repatriation tax upon transition to a territorial system.

[23] These rates are scheduled to increase after 2025, to 13.125 and 16.4 percent. This analysis ignores interaction effects between the provisions.

since Hartman (1985), repatriation taxes need not create lock-out effects for mature firms, if future tax treatment is both certain and unchanging.[24] However, in practice, certainty was lacking, causing companies to stockpile earnings offshore in the hope of more favorable future tax treatment. Indeed, more favorable tax treatment eventually arrived with the TCJA, and it temporarily arrived earlier, with a holiday in 2005. While waiting for favorable treatment, the "lock-out" effect likely dampens the overall enthusiasm for shifting profit offshore, because shareholders are prevented from accessing the profits unless they pay the tax due upon repatriation.

Despite the shift to a territorial system under the TCJA, there are significant provisions under the law that may actually result in a *higher* net burden on foreign income for U.S. multinational companies. While there is no tax due upon repatriation, there is a minimum tax due *currently* on global intangible low-taxed income, or "GILTI" income. While the first ten percent return on assets is exempt from the GILTI tax (providing a perverse incentive to increase real investments abroad), profits beyond that amount are taxable at half the U.S. tax rate.[25] Under plausible circumstances, this will actually raise the burden on foreign profits relative to prior law, as argued by Dharmapala (2018) and others.

But will the GILTI provision cause profit to be shifted into the United States? In practice, that outcome is questionable. Because the TCJA uses a *global* minimum tax, tax obligations in higher tax countries can offset the minimum tax due on haven income. Therefore, companies can

[24] Because the repatriation tax is unavoidable, companies will have the incentive to invest in whatever location generates the greatest profits, knowing that when the income is moved, it will incur a one-time repatriation tax regardless.
[25] The GILTI rate starts at 10.5 percent but is scheduled to increase to 13.125 percent in 2026.

blend their haven and non-haven foreign income, reducing or perhaps eliminating payments of U.S. minimum tax, and achieving a lower tax rate than the U.S. rate.[26]

While the global minimum tax discourages profit shifting to havens, it is effectively an "America last" tax policy from the perspective of revenue, because both low-tax and high-tax foreign countries are tax-preferred relative to the United States, if a company is in deficit credit position with respect to GILTI income. (That distinction will be discussed shortly.) Indeed, the GILTI acts as a support for the tax revenues of our trading partners, reducing tax competition pressures. That feature may speak in its favor, as argued by Morse (2018), because it helps combat a race to the bottom in corporate tax competition.

Under the TCJA, the corporate rate may be somewhat lower if the firm has above-normal profits generated by export sales. However, this provision (the FDII) is likely to be challenged by trading partners because it may not be compatible with WTO obligations.[27] In addition, because it only applies to export sales, companies will still have an incentive to locate profits offshore if some of the resulting profits are generated by sales to the U.S. market. In addition, there is a perverse incentive to avoid locating real assets in the United States, as U.S. assets reduce the amount of FDII that is subject to the deduction, which is only allowed on profits above a normal return on assets.

Finally, there is the base-erosion anti-abuse tax, or the BEAT. This provision is an add-on minimum tax that applies whenever deductible payments to foreign related entities exceed a threshold. There are many curious interactions between the BEAT and other provisions that can also raise the tax burden associated with the minimum tax. While the BEAT is complicated and

[26] Only 80 percent of the foreign taxes paid are creditable, so there will still be some incentive to seek out lower tax locations.
[27] Sanchirico (2018) discusses the FDII; there is some ambiguity regarding the WTO issue, but the FDII is unlikely to be an effective way to encourage U.S. IP activity or buttress the tax base.

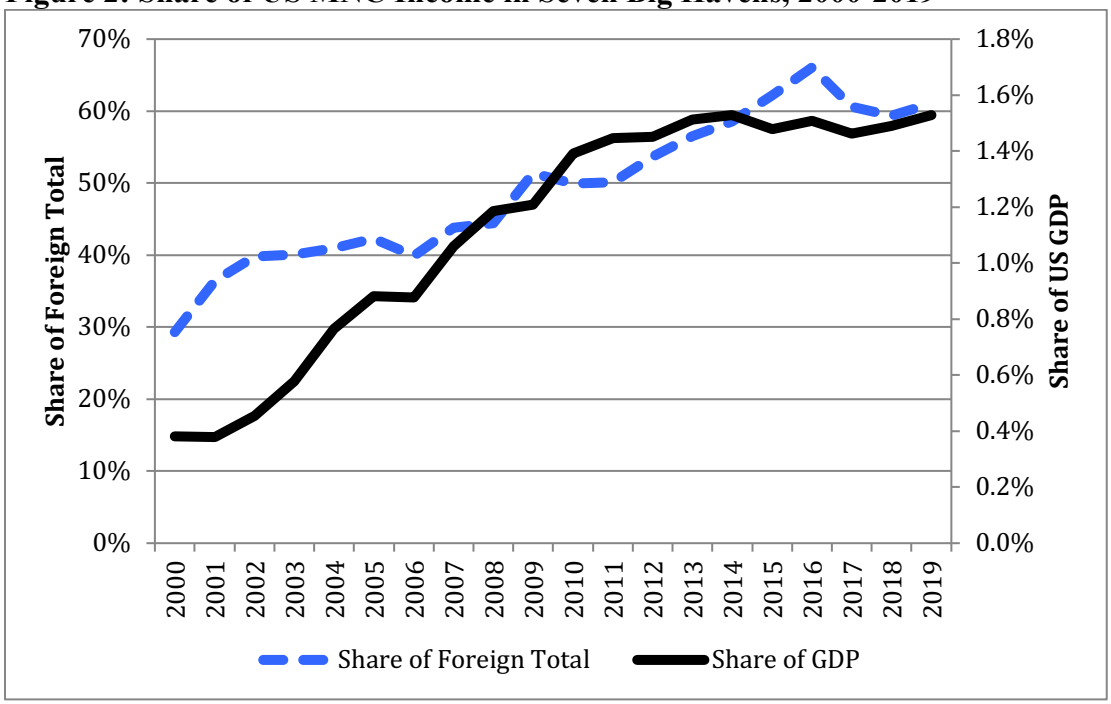
difficult to model, it is a feature of the tax landscape that should *lower* the incentive to shift profits to low-tax locations for both U.S. and foreign multinational companies. Indeed, one salutary feature of the tax is that it treats both U.S. and foreign taxpayers on the same terms.

Once the dust clears, the JCT forecasts that the international provisions of the new law will lose revenue, setting aside the one-time deemed repatriation tax revenue. (This one-time provision is a tax break relative to prior law, but it raises revenue in the ten-year JCT estimate.) In the ten year window, the international provisions lose about $14 billion in revenue, on top of the $654 billion lost due to the corporate tax cuts.[28] That said, revenue estimates are the best guess of JCT experts at the time of the legislation; subsequent changes in tax planning, implementing regulations, and the laws of other countries can impact these numbers. Horst (2019) suggests that the revenue estimates of the international provisions are likely to be too optimistic, based on an admittedly incomplete analysis of company financial statements, and the Congressional Budget Office (2020) has revised downward their revenue projections from the international provisions. In addition, journalists have pointed to ways in which business-favored implementing regulations may have lessened revenues from the provisions, although financial reporting data are likely to be insufficiently detailed to clarify these magnitudes.[29]

Figure 2 shows the pattern of US multinational company direct investment income before and after TCJA; it shows little change in the share of income in tax havens in the wake of the law. While the counterfactual is difficult to establish, the share of income in havens in 2019 (61% of after-tax income; 1.5% of GDP) is identical to the average of the years prior to the law (2013-2017).

[28] There are also about $265 billion in net tax cuts for pass through businesses; these are ignored in the present analysis.
[29] See Drucker and Tankersley (2019) and Eavis (2019).

Figure 2: Share of US MNC Income in Seven Big Havens, 2000-2019



Note: Data are from the US BEA. Data for 2019 are based on the first three quarters of data scaled by (4/3). The big seven havens are: Bermuda, the Caymans, Ireland, Luxembourg, the Netherlands, Singapore, and Switzerland.

The following analysis will estimate the effects of the global minimum tax on profit shifting magnitudes; I will also briefly consider the effects of the statutory rate change. Other aspects of the law are more difficult to model and left for future research. Both the adoption of territorial treatment of some income (and the absence of tax upon repatriation) and the BEAT should affect profit shifting incentives, but they work in opposite directions. Territorial treatment, by removing the possibility of tax upon repatriation, should heighten tax responsiveness, as some evidence from the UK suggests.[30] The BEAT, by discouraging related party payments that facilitate profit shifting, should reduce tax responsiveness. JCT estimates suggest that the former effect will dominate the latter in terms of revenue consequences, but it is difficult to view these

[30] See, e.g., Liu and Langenmayr (2018) and Liu, Schmidt-Eisenlohr, and Guo (2018). See Hasegawa (2018) for an analysis of the Japanese experience.

numbers as more than educated guesses. This paper will not model either provision. Out of necessity, there are also other effects of changes in the law that are not modeled here.[31]

IV. Profit Shifting After TCJA

The following analysis will model the effects of the global minimum tax, the GILTI, on profit shifting. I will also consider the likely impact of the US statutory rate change. In order to consider these questions, several modeling assumptions are needed. First, both above and in prior work, I account for base-narrowing provisions that lower the marginal effective tax rate below the statutory rate. Given the base-broadening provisions of the TCJA, a smaller reduction in the effective rate is now justified. Following the assumptions of the Congressional Budget Office, I will use a rate of 20 percent to capture the new marginal effective rate.[32]

Modeling the global minimum tax rate is difficult, because it depends on the circumstances of individual companies, which are likely to vary widely across industries, and depend on the mix of foreign affiliates' locations. For companies with deficit credits, that do not have enough foreign tax credits to completely offset their GILTI tax, I model the GILTI as *raising* the tax rate on haven income from its current rate to something between 10.5% and 13.125%. Because foreign tax credits are only creditable at a rate of 80 percent, for a country

[31] Every journey begins with a single step. Unfortunately, this exercise would become extremely complicated, and would require a great deal of company-specific information, if all of the effects of the legislation were considered together. Among other things, I do not consider the effects of the limitations on interest deductibility, expense allocation (which may cause companies with higher foreign tax rates to pay GILTI), the effects on accounting measures of tax liabilities (both short and long run), interactions between the GILTI and the BEAT (and those between other provisions), effects on the "real" shifting of jobs or assets (that may be encouraged by elements of the GILTI and the FDII), and the likely tax policy responses of other countries.

[32] See the supplementary tables accompanying CBO's April 2018 *The Budget and Economic Outlook: 2018 to 2028*, available here: https://www.cbo.gov/about/products/budget-economic-data#10. One could quibble with any choice of rate. The 20 percent rate is the CBO rate for 2018-2021 on all corporate capital, weighted across investment and industry types.

with a tax rate of 0, the GILTI rate will be 10.5%, but for a country with a tax rate between 0 and 13.125, the GILTI tax rate will slowly increase from 10.5% to 13.125%. For the purpose of the present analysis, I ignore the zero rate on the first ten percent return on assets; Sullivan (2018) indicates that, at present, this is likely to be a small benefit for most major multinational companies.[33]

For companies with deficit credits, we also need to consider the impact of the GILTI on the incentive to earn income in higher tax countries. Because foreign tax credits can be used to offset minimum tax due on low-tax country income, I model the change in tax rate as a decrease to 10.5 percent plus 20 percent of the foreign rate. For companies with deficit credits, any marginal dollar earned abroad will help offset GILTI tax, effectively lowering its overall tax burden. For example, a dollar of income earned in a 25 percent tax rate country (e.g., the Republic of Korea) will increase the parent company GILTI tax obligations by 10.5 cents, but will also reduce prior GILTI tax burdens by 20 cents, or 80 percent of the 25 cent Korean tax burden. So, the net tax consequence of the additional income earned abroad is 25 cents paid to the Korean government, plus 10.5 cents of additional GILTI tax, minus 20 cents of reduced GILTI burden on haven income, totaling 15.5 cents, which equals 10.5 percent plus 20 percent of the 25 percent Korean tax.

For companies with excess foreign tax credits, where their foreign operations already generate sufficient foreign tax credits to wipe out any GILTI tax due, tax incentives post-TCJA are similar to those under pre-TCJA law, only without the fear of tax due upon repatriation. The marginal consequence of earning another dollar in a haven is the haven rate, because existing foreign tax credits will eliminate any GILTI due. The marginal consequence of earning an

[33] If companies offshore additional real investments in response to the exclusion from tax of the first ten percent return on assets, this exclusion could become more important over time.

additional dollar in Korea will be the Korean tax rate, because there are not additional benefits associated with earning in Korea due to the presence of excess foreign tax credits.

One essential question is how many companies (and how much income) will face the incentives of deficit credit firms and how many companies (and how much income) will face the incentives of excess credit firms. In 2017, for U.S. multinational companies as a group, the effective tax rate on their foreign income (in total) is very similar to the GILTI cutoff.[34] Thus, one plausible assumption is that about half of income is held by companies in excess credit position and half of income is held by companies in deficit credit position, with respect to the global minimum tax. That is the assumption I will adopt initially, but I provide a range of estimates that depend on different values of that parameter.

Of course, as company behavior changes in response to the new tax law, these parameters will likely evolve. According to both the BEA direct investment income data series and the IRS country by country data series, the majority of US MNC profits are in countries with tax rates that fall below the minimum tax threshold. Therefore, at present, the global minimum tax should act as an important force blunting U.S. multinationals' tax sensitivity to the tax rates of foreign countries, for those companies in deficit credit position.

Estimates

The lower U.S. corporate tax rate makes a difference in the marginal incentive to shift income, but potentially more important is the global minimum tax. Before the tax law changes, the difference in effective tax rates between the United States and major trading partners often varied from nearly -30 percent to + 30 percent. At one extreme lie countries like Bermuda with

[34] Using Table 3 of the Country by Country reporting data, the amount of tax paid relative to the total profit earned by US multinational groups (ignoring groups with losses) is 13.0 percent.

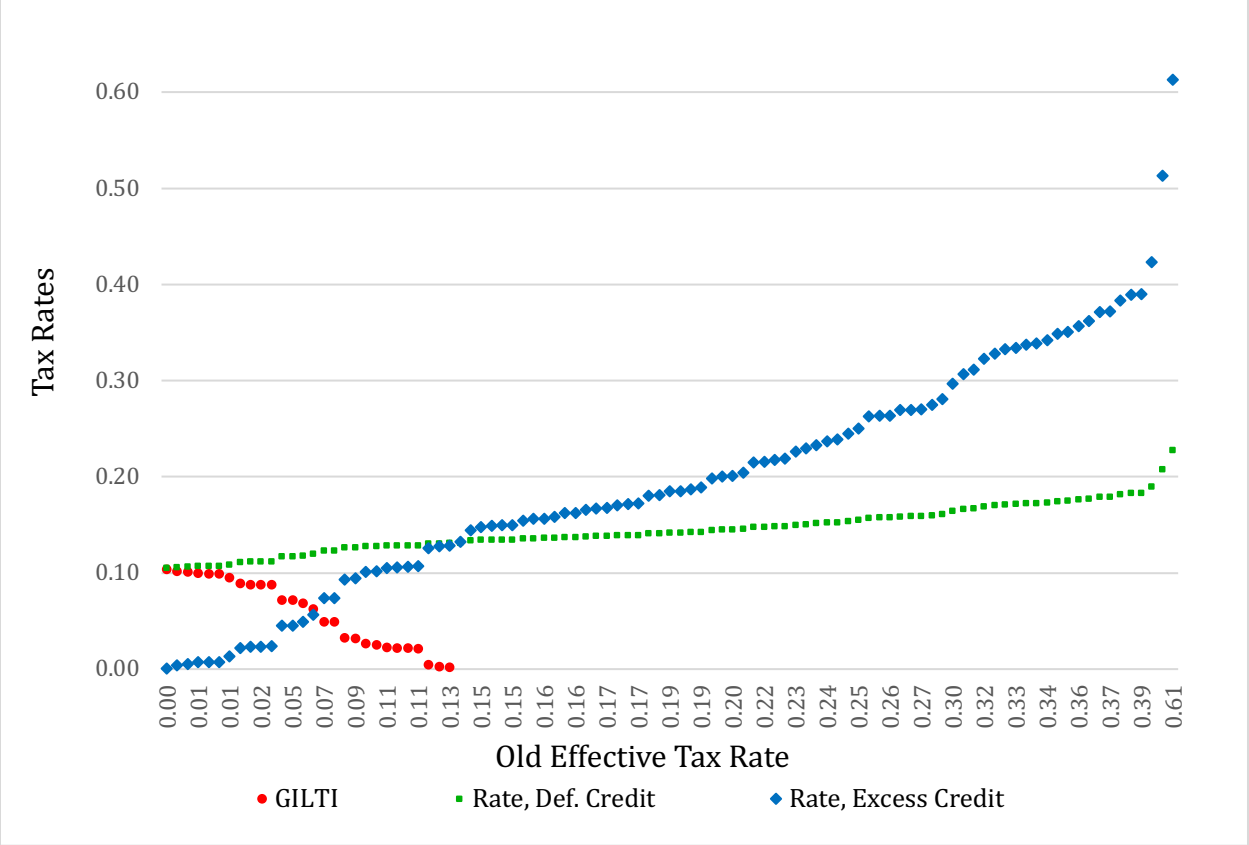
an effective tax rate approaching zero; at the other end there are countries where the effective tax rate for U.S. foreign affiliates was 60 percent or higher.

After TCJA, for those companies with operations in both high and low tax countries that have insufficient tax credits to cover the GILTI, these comparisons look very different. The U.S. tax rate declined, and foreign tax rates are now highly compressed for deficit credit companies, from a 10.5 percent rate (on above normal returns) for zero tax rate countries, to a 10.5 + (0.2 * T_f) rate, where T_f is the foreign tax rate, for high tax countries, because those streams of income can be blended with GILTI income. For any foreign country with a tax rate less than 52.5 percent, this rate is lower than the new U.S. statutory rate. At 52.5 percent, the two rates are even.

For excess credit companies, aside from the lower U.S. rate and the absence of tax upon repatriation, little is changed. There are still substantial incentives to put profits in havens (many of which offer a roughly zero marginal rate) and to avoid putting profit in high-tax locations, where it will face the full marginal foreign rate.

Figure 3 shows these tax treatments for excess credit and deficit credit companies. The old effective tax rates (marked by the blue diamonds) are also the rates faced by companies with excess credits; they range from about zero to about 60 percent. As Figure 3 indicates, the new GILTI-inclusive rates for deficit credit companies (marked by the green squares) are far more compressed than those rates, ranging from 10.5 percent to about 22 percent. The GILTI's contribution to the total tax rate for low tax countries is also indicated in the figure, marked by red circles. Again, this figure simplifies the picture, as it ignores many details, including the impact of the BEAT, interactions between the BEAT and the GILTI, the issue of losses, and other considerations.

Figure 3: Effective Tax Rates for GILTI Income, Before and After TCJA



Note: Author calculations based on IRS Country by Country data in 2017.

In modeling the likely effects of this legislation on profit shifting, one should distinguish between the steady-state response to changes in tax incentives and the immediate response. Immediately after the legislation goes into effect, it is unlikely that companies will reorient their profit shifting in response to compressed tax rates. It's true that the gap between Bermuda (a zero tax rate country) and Angola (a country where US MNCs paid an effective tax rate of 60 percent in 2017) is much smaller than it once was for some firms, but if one has profit booked in Bermuda instead of Angola, it hardly pays to rearrange things so that the income is now booked in Angola. Simply put, a lower tax rate is still lower. The companies that are currently engaged in profit shifting have already set up vast accounting and legal operations surrounding minimizing global tax burdens; given the magnitudes involved, it is unlikely that these

operations will cease if they can only save ten percent instead of thirty.[35] Indeed, Figure 2 above shows little diminution of profit shifting in the first one and three-quarters years since the legislation came into effect.

On an ongoing basis, for companies with deficit credits, it is apparent that the United States will be the least desirable place to book income, because the GILTI rate is well below the U.S. rate, and high-tax country income is also tax-preferred to U.S. income as long as the foreign rate is below 52.5 percent. For excess credit companies, booking income in the United States remains preferable to foreign income so long as the U.S. rate is lower than the foreign rate, which is more likely now, because the U.S. statutory rate has dropped to 21 percent. But, haven income is better still.

In the steady-state, once companies and their tax planners have adjusted to the new tax environment, profit shifting is less lucrative than it was previously, and that should have material effects on the extent of profit shifting. The following analysis undertakes a preliminary analysis of the likely steady-state response of U.S. multinational companies profit shifting behavior in light of the GILTI global minimum tax.

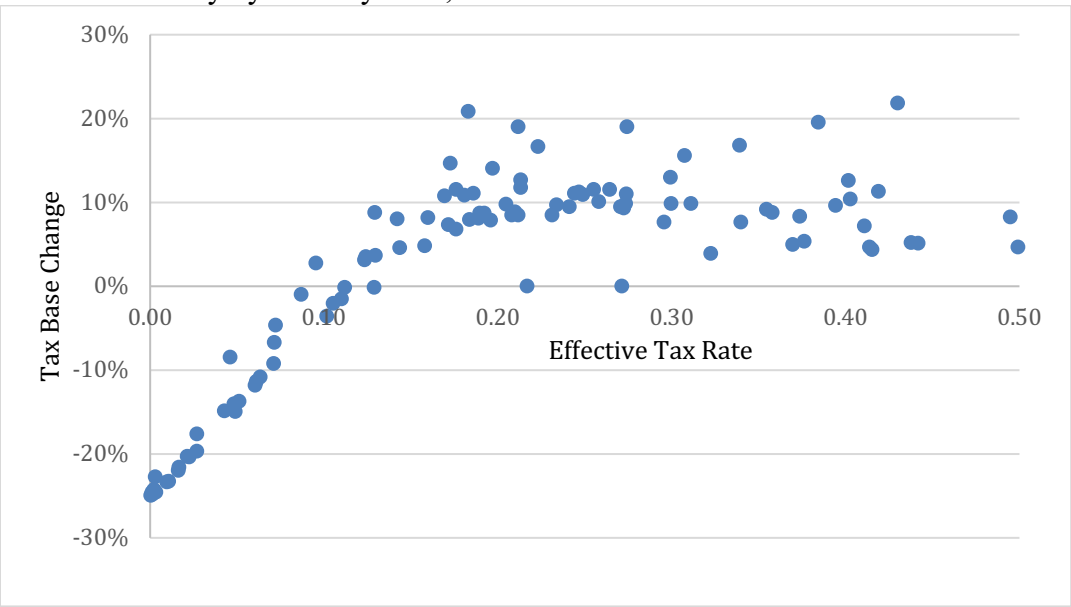
Figure 4 shows the estimated change in profits for each country, ordered by their 2017 effective tax rate, due to the GILTI global minimum tax. The analysis makes several assumptions that are then varied. It assumes that half of the foreign income of U.S. multinational companies is held by companies in deficit credit position and half is held by those in excess credit position, with respect to the GILTI tax. For the companies in deficit credit position, the effective tax rate abroad changes as indicated by Figure 3 (from the blue diamonds to the green squares); for companies in excess credit position, the effective tax rate abroad is unchanged. Changes in the

[35] Indeed there is substantial evidence that suggests that large companies do the vast majority of all profit shifting, perhaps due to the large fixed costs associated with setting up the associated legal and accounting expertise. See, e.g., Wier and Reynolds (2018).

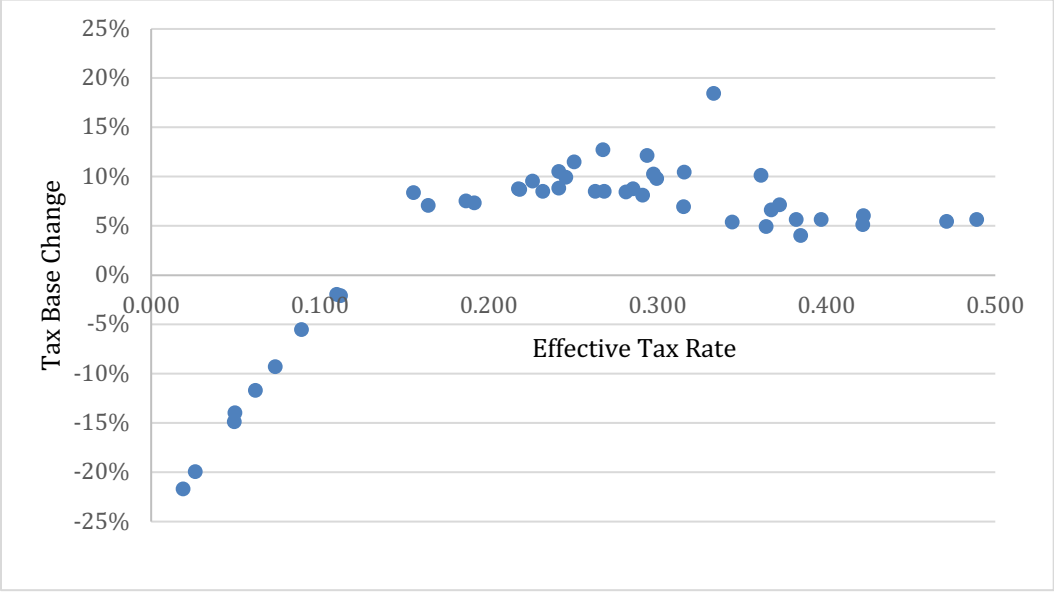
tax rate are multiplied by the elasticity of the tax base with respect to the tax rate, using the non-linear elasticities, as detailed in Appendix A.

Figure 4: Tax Base Change for U.S. Affiliates due to Global Minimum Tax
(ordered by Effective Tax Rate in 2017, using non-linear elasticities)

Panel A: Country by Country Data, 2017



Panel B: BEA Direct Investment Income Data, 2017



The total tax base change across all foreign countries is then allocated across countries according to a formula, as in section III above, that reflects an equal weighting of the countries'

share of employment by U.S. affiliates (number of employees) and the countries' share of sales of U.S. affiliates, relative to the foreign total (which itself is one-third of the world total). Alternative formulas can be easily considered and don't significantly change the main conclusions for either the United States or major groups of countries, although individual countries may have idiosyncratic reasons to favor particular formulas.

As summarized in Table 3, these calculations imply that the GILTI tax will reduce profits booked in havens by 12-16 percent, increasing profits booked in other high-tax countries by 8-9 percent, and increasing the U.S. tax base by $17-30 billion, resulting in about $3-6 billion in tax revenue each year at new tax rates.

Table 3: Changes in Corporate Tax Base Due to GILTI Global Minimum Tax

	BEA DII Series		**IRS CbC Series**	
	Tax Base Change, billions	Tax Base Change, percent	Tax Base Change, billions	Tax Base Change, percent
Min Tax Countries	-35.9	-11.7%	-55.1	-15.5%
Others, Non-Havens	18.3	8.1%	21.6	9.1%
Of which: Rich	13.0	8.0%	12.2	23.6%
Non-Rich	5.4	8.1%	9.5	5.1%
U.S.	16.6		29.8	
U.S. Revenue ($b)	3.3		6.0	

Note: This analysis considers the steady-state effect on tax bases. The change in revenue above is calculated at a 20% marginal effective tax rate. Data are from 2017.

Note that these numbers are **not** revenue estimates. Instead, these numbers show an estimate of how behavioral responses by companies may change the location of U.S. affiliate profit shifting in the steady-state, after the adjustment to the new tax law is complete. Also, estimates are based on 2017 data because that is the most recent year with broadly available data; hence, this table shows the change to tax bases in 2017 if TCJA had already been fully in effect (and adjusted to) in 2017.

It is relatively simple to change the assumption regarding the fraction of total foreign income held by companies that are in deficit credit position versus excess credit position with respect to the global minimum tax; Appendix B provides a range of estimates for situations where between 10 and 90 percent of income is held by companies that have deficit credits with respect to the global GILTI tax.

Neither the adoption of territoriality (the removal of the tax upon repatriation as well as territorial treatment for some income) nor the BEAT are modeled here. From a U.S. perspective, the JCT estimates indicate that territoriality may worsen profit shifting more than the BEAT remedies it. However, the BEAT also affects foreign multinational companies, and for that group of companies, the effects are unambiguous. Both the lower U.S. rate and the BEAT should reduce the incentive to shift income out of the U.S. tax base. However, the behavior of foreign multinational companies is not modeled here.

V. Alternative Policies

There are both incremental and wholesale tax policy changes that would affect the profit shifting landscape more dramatically. Examples of incremental changes include a higher minimum tax rate, or instituting a per-country version of the minimum tax. Either change would raise more U.S. revenue and further reduce profit shifting incentives. Table 4 shows estimates for a per-country version of the minimum tax; this change increases the U.S. revenue gain from the minimum tax substantially, by at least 250 percent.

This change is primarily due to a larger reduction in profit shifting when tax responsiveness is not reduced by the "global averaging" feature of the GILTI; under a per-country tax, no companies would be able to avoid GILTI through cross-crediting with higher-tax

income. For foreign countries that are not minimum tax countries, the positive effects of less profit shifting to havens are roughly the same size as the negative effects of less blunting of their higher tax rates via global averaging; together, they are as well off as they were under the global minimum tax.

Table 4: Effects of a Global Minimum versus a Per-Country Tax

	Global Minimum Tax	Per-Country Minimum Tax
BEA DII Series		
Minimum Tax Country US Affiliate Tax Base (%)	-11.7%	-23.0%
Other Foreign Country US Affiliate Tax Base (%)	8.1%	7.9%
US Corporate Tax Base (billions USD)	$16.6b	$49.7b
Implied Additional US Revenue	$3.3b	$9.9b
IRS CbC Series		
Minimum Tax Country US Affiliate Tax Base (%)	-15.5%	-30.6%
Other Foreign Country US Affiliate Tax Base (%)	9.1%	9.3%
US Corporate Tax Base (billions USD)	$29.8b	$77.0b
Implied Additional US Revenue	$6.0b	$15.4b

Source: Author calculations based on BEA and IRS data and assumptions in text.

A higher minimum tax rate would also further level the playing field between the United States and lower-tax countries. Indeed, if the GILTI rate were harmonized with the regular U.S. rate, there would no longer be an incentive to shift profit offshore, nor would there be need for BEAT or FDII (for U.S. multinational companies). There would remain an incentive to avoid paying tax in countries with rates higher than that of the United States. Appendix C considers possible revenue gains from higher per-country minimum taxes between 21 and 35 percent. US

revenue gains are substantial, from about $35 billion under a 21 percent minimum tax to more than twice that under a 35 percent minimum tax.[36]

While such changes would reduce profit shifting, there are also concerns. Harmonizing rates on domestic and foreign income basically transforms our tax system into a true worldwide system, with more bite than our prior purportedly worldwide system because foreign income is taxed currently. It is possible that a lower corporate tax rate would make such a change more palatable. Still, for some reason, the very label "territorial" was fetishized in the debate surrounding the TCJA. In fact, moving to a "territorial" system was deemed more competitive, even though it arguably raised tax burdens on foreign income for many U.S. multinational companies relative to prior law. Still, there is a legitimate argument that a worldwide system harms resident companies in competition with non-resident companies in third markets, potentially distorting ownership patters of investment in a way that reduces efficiency. The tax disadvantage faced by resident companies could also encourage corporate inversions, although there are useful anti-inversion legislative remedies that could be pursued.

Indeed, there is a clear tradeoff between corporate tax base protection and this notion of competitiveness, on which I've written extensively elsewhere.[37] However, I would argue that both the prior U.S. system and the present one have not struck the right balance between these two policy desiderata.

Instead, both systems put too much emphasis on competitiveness relative to corporate tax base protection. Under the prior system, U.S. multinational companies were the envy of the world in terms of their outsized impact on world markets, their historically large corporate

[36] I report an even wider range in Appendix C since I consider all four data series. In the text, I average the two preferred data series of this analysis, the BEA direct investment income series and the IRS country by country series.
[37] See Clausing (2016b, 2018, 2020c).

profits, and their savvy tax-planning acumen. U.S. corporate tax receipts were fifty percent lower (as a share of GDP) than that of our typical trading partners. U.S. companies have a disproportionate presence on Forbes lists of the world's top 2000 companies, and U.S. corporate profits are about 50 percent higher as share of GDP (before or after tax) in recent years, relative to prior decades.[38] Competitiveness does not seem to be a clear problem. On the other hand, as Appendix A indicates, the U.S. government loses enormous amounts of revenue due to profit shifting.

From this starting point, along comes the TCJA, providing net corporate tax cuts of over $650 billion over the next decade. While some provisions certainly make a dent in the profit shifting problem, the international provisions of the legislation are conflicting, and taken as a whole, will not raise substantial U.S. revenue. Much more could be done to protect the corporate tax base.[39]

Further, in this fiscal environment, it is unclear that these corporate tax cuts are affordable, as debt to GDP ratios were already scheduled to reach 90 percent over the coming decade prior to the TCJA, and now are estimated to approach 100 percent of GDP over the coming ten years.[40] While there are certainly other sources of revenue that could be tapped, the corporate tax has an important role to play in our broader tax system. From an equity perspective,

[38] For more on the U.S. position in Forbes lists, see Clausing (2018). For more historical and comparative data on U.S. corporate tax revenues and U.S. corporate profits, see Clausing (2016c).
[39] There are daunting political obstacles, however. The U.S. corporate community has complained about the BEAT and the GILTI, both tougher provisions than expected. Thus, it is likely that there will be pressure to weaken these provisions, and indeed some journalists have noted that implementing regulations may have already had that effect. See Drucker and Tankersley (2019).
[40] See Congressional Budget Office (2018).

it is more progressive than any tax in our system aside from the estate tax, which itself is small, and shrinking under the TCJA.[41]

From an efficiency perspective, in the presence of expensing and large subsidies for debt-financed investments, the corporate tax largely falls on the "excess profits" of companies, not on the normal return to capital. Taxing excess profits is efficient, and recent research also suggests that taxing the normal return to capital is no more inefficient than labor taxation.[42] Finally, from a tax administration standpoint, the corporate tax is one of our only tools for taxing capital income, since the vast majority of U.S. equity income goes untaxed by the U.S. government at the individual level.[43] The corporate tax also has an important role to play as a backstop to the individual tax system, because without a corporate tax, the corporate form generates sheltering opportunities. For all of these reasons, the next round of corporate tax reform should focus on protecting the corporate tax base in order to meet important revenue, progressivity, and efficiency goals.

In addition, there are clever ways to reduce tax competition pressures and combat fears regarding competitiveness. A formulary apportionment system, or a destination-based corporate tax, would lower the tax responsiveness of the tax base, providing a better environment for a robust corporate tax. These policy options are discussed further elsewhere, but they should be carefully considered in future reform efforts.[44] And, even absent such grand reforms, the pressure for corporate inversions can be averted through simple, off the shelf, anti-inversion measures.[45] Finally, it is important to remember that competitiveness entails far more than the corporate tax

[41] For a complete defense of the role of the corporate tax, see Clausing (2016c). For more on the incidence of the corporate tax, see Clausing (2013) and Clausing (2020a).
[42] See, e.g., Farhi et al.(2012), Conesa, Kitao, and Krueger (2009), Straub and Werning (2019), and Piketty and Saez (2012, 2013).
[43] See Burman, Clausing, and Austin (2017).
[44] See, e.g., Avi-Yonah and Clausing (2008, 2017) and Clausing (2020c).
[45] See Clausing (2014), Shay (2014), and Kleinbard (2014).

system; investments in human capital, infrastructure, and sound, stable governance institutions all play essential roles in creating a strong business climate.

VI. Conclusion

The Tax Cuts and Jobs Act contains several features that change the profit shifting landscape. The lower statutory rate, the GILTI, and the BEAT are likely to reduce profit shifting offshore, while the territorial treatment of (some) foreign income, and the absence of tax upon repatriation, are likely to increase profit shifting incentives. Due to the complexity of the tax law changes and the interactions among them, as well as the moving target of foreign tax policies and multinational company tax planning, precise conclusions about the impact of the TCJA are difficult. Many of the international features of the law are unchartered territory, and there are myriad questions for future research.[46]

This analysis has considered profit shifting incentives before and after the TCJA. Before the TCJA, deferral of U.S. tax on foreign income provided large incentives to minimize global tax burdens by shifting income to tax havens. U.S. multinational companies, aided by a permissive regulatory environment, became renowned profit shifters. In 2017, a majority of the direct investment earnings of U.S. multinational companies were booked in just seven havens, and these seven countries accounted for the vast majority of all U.S. multinational profit shifting activity. By 2017, profit shifting by U.S. multinational companies reduced corporate tax

[46] It would be especially useful to study the consequences of the BEAT as well as the role of the TCJA in shaping international tax competition.

revenues by large magnitudes, regardless of the data set or method employed; my preferred estimates suggest a revenue loss of approximately $100 billion per year.[47]

While this is a large number, the counterfactual is a world without profit shifting, and most legislative changes are likely to stop far short of such a world.[48] The TCJA is no exception; it is far from an end to profit shifting. However, there are still substantial changes in the tax landscape. In addition to the reduction in the U.S. statutory rate, the global minimum tax on GILTI income acts to substantially compress tax rate differences across countries for some companies. When companies do not have sufficient foreign tax credits to offset the tax due under GILTI, the GILTI provision raises the marginal tax rate on non-exempt haven income to at least 10.5 percent (up to 13.125 percent), and it lowers the marginal tax rate on higher-tax foreign income substantially.[49] On the other hand, for companies with large amounts of foreign tax credits offsetting the GILTI, the marginal incentives to shift income across countries are largely unchanged, aside from the U.S. statutory tax rate reduction and the end of tax upon repatriation.

Overall, after adjustment to the GILTI is complete, estimates indicate a 12 to 16 percent reduction in the U.S. affiliate corporate tax base in tax havens, an 8 to 9 percent increase in the U.S. affiliate corporate tax base for foreign countries above the minimum tax threshold, and a $15-30 billion increase in the U.S. corporate tax base each year.

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[47] Every data set comes with its own imperfections; I review the strengths and weaknesses of various data sets in Appendix A. All estimates are large, in the many tens of billions, but there is a wide range of possible estimates, depending on the preferred data set and estimation method.

[48] Some dramatic reforms, such as a pure worldwide system, formulary apportionment, and a destination based cash flow tax, would come close to eliminating profit shifting, though of course they would not eliminate tax avoidance, as firms might then undertake other decisions, such as mergers or acquisitions, or changes in ownership structure, to avoid tax. Still, not all decisions are equally tax sensitive. It is widely known in public finance that there is a hierarchy of behavioral response, such that financial decisions are far more sensitive to tax incentives than are "real" decisions. See, e.g., Auerbach and Slemrod (1997) and Saez, Slemrod, and Giertz (2012).

[49] The first ten percent return on assets is untaxed under the GILTI, so it faces the foreign tax rate, with no residual U.S. taxation.

A per-country minimum tax would have far larger effects; it would increase U.S. revenues, and reduce profit shifting to tax havens, far more substantially. On the other hand, although the U.S. statutory tax rate reduction is important for domestic firms, it is not a determinative force when it comes to profit shifting activity, because the distribution of shifted profits is extremely concentrated in the lowest tax countries.

Much is on the agenda for future research, including understanding the effects of implementing regulations as well as studying the many other international tax effects of the TCJA. For example, the quasi-territorial nature of the tax system (with no tax due upon repatriation, and tax free treatment for some foreign income) may increase profit shifting incentives more than the BEAT decreases profit shifting incentives, possibly cutting into the modest beneficial effects on profit shifting that are discussed here. Still, both the GILTI and the BEAT should be applauded for reducing international tax competition pressures, relative to a hypothetical version of the TCJA without these provisions.

In the end, the Tax Cuts and Jobs Act certainly provides tax cuts; that much is certain. The net ongoing corporate business tax cuts total more than $650 billion over the coming decade.[50] In my opinion, revenue-neutral business tax reform, as previously suggested by both Democrats and Republicans, would have been a far better path forward.[51] In addition, the positive effects of the these tax cuts on the larger economy were substantially oversold, though it will take time to establish their ultimate effect.[52] Beyond doubt, the TCJA has created many interesting questions for economic research.

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[50] As before, I am ignoring the one time repatriation tax on previously earned income, which is a tax cut relative to prior law, but raises revenue in the ten-year window.

[51] In recent years, both former Ways and Means Chair Dave Camp (a Republican) and the Obama Administration offered examples of such reforms.

[52] The Trump Administration made particularly far-fetched claims of $4,000-$9,000 average wage increases resulting from the corporate tax cuts, and officials also argued that companies would share their

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Appendix A: Estimating the Size of Profit Shifting[53]

Background on Prior Work

There is a large discrepancy in the literature on profit shifting between sources that rely on financial accounting databases (such as Orbis and Compustat) and sources that rely on macroeconomic statistics, tax data, or survey data on multinational companies. Studies using the accounting databases find far smaller magnitudes of profit shifting and much lower elasticities than the other types of studies. Further, meta-analyses and literature surveys such as Heckemeyer and Overesch (2017) and Dharmapala (2014) that disproportionately rely on financial accounting database studies also minimize the magnitude of the profit shifting problem.[54]

There are several simple explanations for these discrepancies. While financial accounting databases are understandably very attractive to researchers since they allow the use of company-specific information, they come with crucial drawbacks. First, accounting databases such as Orbis and Compustat exclude most data on profits in havens from big multinational companies. Indeed, haven data can be nearly absent. However, even a cursory look at *any* other data source on the country distribution of profits, including the recently released country-by-country database, shows very large amounts of income booked in haven countries. If you are missing haven income, you are missing the vast majority of the problem.

Second, a small number of very large multinational companies undertake the vast majority of all profit shifting, as shown by investigations by Wier and Reynolds (2018) and others. As Bilicka (2019) argues, there is reason to suspect that there are fixed costs associated with profit-shifting. This implies that large companies will be more willing to invest in the legal and financial expertise required to shift profits. Yet studies that treat each company observation equally may miss the fact that the tail of the distribution behaves differently from the average observation.

Third, as Dowd, Landefeld and Moore (2017) have persuasively argued, tax responsiveness is likely to be nonlinear, such that elasticities are highest with respect to haven countries. Dowd, Landefeld, and Moore employ US tax data, the best possible data for studying this question, finding large elasticities with respect to haven data. Indeed, nonlinear elasticities tend to fit the data better than linear ones. This makes intuitive sense. When shifting profits, surely it is best to aim for the lowest tax rate possible; shifting profits from a 30 percent country to a 20 percent country is less advantageous than moving profits toward havens with near-zero tax rates.

Due to the importance of tax havens, non-linear elasticities, and large, highly profitable companies, studies using accounting databases are likely to substantially underestimate the profit shifting problem. These studies are based on data that excludes almost all haven income, and studies also frequently treat companies similarly irrespective of size.

[53] This appendix includes some information and text that also appear in Clausing (2020b).
[54] This effect can be seen very clearly in Table 4 of Heckemeyer and Overesch (2017). Elasticities are far smaller for studies that employ financial accounting database data, and such studies dominate these surveys.

Recently, Blouin and Robinson (2019) suggest an additional reason for these differences in empirical magnitudes. In particular, they are concerned about flaws in researchers' interpretations of the data sources in the second sets of studies (using tax, survey, or macro data), due to the inadvertent inclusion of double-counted data or the misallocation of profits due to incorrect inferences about the location of profit in the presence of chains of ownership.

Double-counting has long been recognized (by myself and others) as a problem in one BEA series on foreign income: the net income series now found in Table IID1 of the multinational operations dataset. Double counting is *not* a problem in two other BEA data series: the direct investment income series, and the profit type return series. Nor is double-counting a problem in macroeconomic data, and it is unlikely to be a significant problem in tax data (5471), once dividend income is excluded. Whether double-counting is a problem in the US country by country data is unclear, but if there is double-counting, it does not appear to be a large problem.[55]

However, Blouin and Robinson argue that a simple adjustment of the BEA net income series is possible, and comparing that series to the other series illustrates that other series may be misattributing too much income to low-tax countries, a result that they attribute to misunderstandings surrounding the equity method of accounting.

Yet there are other possible explanations for the differences between the adjusted data series of Blouin and Robinson and the other series they consider. These include differences of coverage, definitional differences, book/tax differences, and the possibility that their adjusted series does not include all profit shifting.

In particular, the BEA researchers that work most closely with these data hold that the adjusted series determines where income is earned for accounting purposes, but it does not indicate where income is booked for tax purposes. In particular, when income is shifted *among* foreign countries, the adjusted series may put too much of the income where it was earned rather than where it was taxed.[56]

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[55] I omit stateless income from the analysis, which is a possible source of double counted income. Revenue is defined to exclude intracompany dividends, implying that profit should also exclude that source of income. Still, the definition of profit may be unclear, and companies are free to supply data as they see fit. Still, since the data are known to be used for transfer pricing risk assessment, it is unlikely that companies will have an incentive to overstate their income, especially in tax havens. Further, foreign totals are similar to those reported from other sources that are known to exclude double-counting.

See Horst and Curatolo (2020) for more on the possibility of double-counting in the stateless income data. Their analysis suggests a 14 percent discrepancy between country-by-country income totals (for both the United States and foreign countries) and totals in financial reports, when stateless income is excluded. There are several possible reasons for discrepancies, including the larger company coverage of the country-by-country data, the fact that reporting and definitional differences exist between the series, and the possibility that the country-by-country totals are overstated due to confusion about form 8975 directions. In the last event, it is possible that US income is overstated, which would not affect the current analysis, but it is also possible that some foreign lines may be mis-measured.

[56] When BEA economists corresponded with the authors and myself during the summer and fall of 2019, there remained disagreement regarding whether the Blouin and Robinson adjustment inadvertently eliminated some foreign-to-foreign shifting. The BEA economists maintain that they do eliminate some foreign-to-foreign shifting, and the data below also support that possibility. Still, it is possible that some

There are also possible problems due to the possibility of hybrid dividends that may appear as a deductible payment for the high-tax originating affiliate but equity income for the low-tax receiving affiliate. It is unclear how the survey data would treat hybrid dividends, but they may be included as equity earnings in the low-tax receiving affiliate.

Sorting out where untaxed income should be located is also important. As Dyreng, Hills, and Markle (2019) show, many foreign earnings go entirely untaxed by foreign jurisdictions; their preliminary work suggests that untaxed foreign earnings are both substantial and increasing, reaching $170 billion in 2017.

While it is certainly important to acknowledge the limits of some data series, the adjusted series suggested by Blouin and Robinson raises its own puzzles. For example, the adjusted series generates negative profits in Bermuda in 2016 and 2017, and very small profits in other recent years, despite the fact that country-by-country data show $634 billion in accumulated earnings in Bermuda, tens of billions of which was earned in each of 2016 and 2017. Such puzzles are compatible with the view that the adjusted series excludes some foreign-to-foreign profit shifting.

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of the disagreement is due to terminology. Blouin and Robinson's method will show us where income is earned from an accounting perspective. However, the costs of profit shifting are generated by deviations between where income is truly earned and where it is reported for tax purposes.

Table A1 illustrates these puzzles. In general, the adjusted series yields a smaller share of income in tax havens, compared with either the direct investment earnings series or the country-by-country data; I have excluded all "stateless" income from the country-by-country totals.

Table A1: Foreign Profits, in millions, 2017

	Adjusted Method (BR)	BEA Balance of Payments Direct Investment Income		IRS Country-by-country Data (income series are before tax)		
	Net inc.+ for. tax-equity inc.	after tax (reported)	before tax (calculated)[57]	Full Sample	Positive Profit	Accumulated Earnings
All countries[58]	571,007	470,933	574,958	638,467	873,621	4,240,635
Stateless (omitted from totals and subtotals)				203,571	215,170	690,583
Puerto Rico				34,335	35,236	114,439
Ireland	82,519	51,804	55,930	29,478	34,221	103,961
Luxembourg	6,484	36,825	38,734	24,866	60,438	357,328
Netherlands	58,676	76,083	81,120	40,010	69,964	461,814
Switzerland	37,696	30,474	34,332	49,376	59,204	374,797
Bermuda	-10,431	32,341	33,215	32,476	35,433	634,413
UK Caymans[59]	20,675	33,235	33,888	58,540	62,369	142,467
Singapore	35,270	24,496	27,529	54,642	56,788	174,888
Big Haven Total	230,889	285,258	304,748	323,723	413,653	2,364,107
Big Haven Share	40%		53%	51%	47%	56%

Note: Big havens include only the specific havens listed above, although the country by country data reveal many other small havens. In the 2017 data, Jersey emerges as a big haven with $461 billion in accumulated profits; however, Jersey is not included as a big haven in this Table.

In 2017, the adjusted series produces similar foreign totals as the direct investment earnings series, once they are calculated on a before-tax basis. However, in earlier years, these series do not always align well. 2014 numbers are similar, but in 2015 and 2016, the adjusted series produces smaller totals, as shown in Table A2. Tax data, from both the country by country data set (only available in 2017 on a complete basis), and from the form 5471 CFC reports (not yet available past 2014), produce larger totals too, as well as larger shares of income in havens.

In the country by country data, many more havens are visible, including some that appear to have large magnitudes of profits, such as Jersey. In the 5471 data, dividend income has been removed from the totals, so there should be no double-counting in those data.

[57] This calculation adds back foreign taxes paid from the income statement to the direct investment earnings series. There may be imperfect country matching if direct investment income is distributed across countries differently from net income, but it gives plausible relative magnitudes, especially for the totals.

[58] This total excludes stateless income.

[59] BEA data lists as "UK Caribbean Islands" but other sources list as Caymans.

Table A2: Foreign Profits, in millions, 2014-2017

	BEA Adjusted Income Data	BEA Direct Invest. Income	IRS Country by Country (full)	IRS Country by Country (Positive profits)	IRS 5471 CFC Data (w/o dividend income)	IRS 5471 CFC Data (w/o dividends; positive profits)
2017						
All countries	571,007	574,958	638,467	873,621		
Big 7 Share	40%	53%	45%	43%		
All Haven Share			58%	55%		
2016						
All countries	420,565	514,483				
Big 7 Share	41%	58%				
2015						
All countries	428,446	524,755				
Big 7 Share	40%	54%				
2014						
All countries	580,597	590,286			647,557	789,633
Big 7 Share	34%[60]	48%			57%	53%

Note: All data are defined or calculated to be before-tax. All complete available years are shown. Havens are defined either be the big seven havens (Ireland, Luxembourg, Bermuda, Caymans, Netherland, Singapore, and Switzerland) or to include those havens plus all countries with effective tax rates below ten percent (in the IRS data). The IRS country by country data reveal many other important havens such as Jersey, Isle of Man, Gibraltar, Puerto Rico, Mauritius, Barbados, and the British Virgin Islands. In the country by country data, I omit stateless income from all calculations. In the BEA data, there are typically almost no other countries that qualify as havens using an effective tax rate threshold of 10 percent. The BEA adjusted income adds back foreign taxes and subtracts equity income. IRS 5471 data are only available for 2014 and omit dividend income.

[60] Data are missing for Bermuda for this year, which probably lowers the haven share.

Further, important puzzles arise when trying to reconcile the adjusted method series with the large stocks of accumulated earnings reported by companies in the 2017 country by country data series. These puzzles are well illustrated in Table A3. Over the period 2008-2017, the adjusted series indicates a total of $51 billion booked in Bermuda, whereas direct investment earnings data indicate a total of $264 billion, a quantity more consistent with a stock of $634 billion in accumulated earnings.[61] Similar puzzles exist for several other haven countries.

Table A3: Earnings Over 2008-2017 and Accumulated Earnings in 2017

	BEA Data: Adjusted Method (2008-2017)	BEA Data: Direct Inv Income[62] (2008-2017)	IRS Country-by-country Data: Accumulated Earnings (2017)
All Foreign	3,872,920	4,485,765	4,240,635
Seven Havens	1,243,257	2,052,438	2,249,668
of which, Bermuda	51,092	263,871	634,413
Seven Haven Share	32.1%	45.8%	53.1%

Note: The seven havens include Bermuda, Caymans, Ireland, Luxembourg, Netherlands, Singapore, and Switzerland. For the BEA data, 2009 and 2014 are excluded since some haven countries are missing data for those years; those columns report only the eight years with complete data.

Below, I discuss multiple data sources, describing their strengths and weakness. Then, using four different series, and three different methods, I generate estimates of the scale of profit shifting. These estimates indicate that profit shifting remains a large revenue problem for the United States.

The Four Data Series

The four data series used in this analysis correspond to those in Table A1: the BEA adjusted income series, the BEA direct investment income series, the full country by country data set, and the "positive profit" country by country data set, where companies reporting losses are excluded.

1. Adjusted Income Series. This series adjusts the net income data from the BEA surveys to add back foreign taxes and to subtract equity income. **Positives:** The series relies on survey data from the US BEA; a long time series of cross-country data are available. This series, by excluding all equity income, excludes any potential double-counting in the data. Since multinational companies are required by law to complete the survey, data should be complete. Since the data are not used for financial reporting or tax purposes, there is no apparent incentive to distort the data. **Negatives:** While this series may be accurate for reporting where income is located for some accounting purposes, it is likely to miss some foreign-to-foreign profit shifting, thus allocating too little income to tax havens. Hybrid dividends may lead to the mischaracterization of some equity income. Untaxed foreign earnings may not be accounted for in the proper jurisdiction or may even be invisible. The series generates

[61] None of these numbers have been adjusted for growth in invested earnings.
[62] Data are again calculated to be before-tax, to ease comparison to the adjusted series.

important discrepancies between annual income reported in haven jurisdictions and the far larger stock of reported accumulated earnings in such jurisdictions.

2. Direct Investment Income Series. **Positives:** These data have been reported by the US BEA for a long time series of cross-country observations. This series is also free of any double-counting concerns. Data coverage should be very good. **Negatives:** Income is counted as originating in the "last" country before the flow to the United States, which may be different from the country where income was earned for accounting purposes or reported for tax purposes, although there is no reason to suspect that the tax rates of reporting countries will be systematically lower than those where tax was paid. Data are after-tax, so they are not directly comparable to other before-tax series, and matching with foreign tax data from BEA surveys will be imperfect. Only the US-owned portion of direct investment income is included, so this omits any foreign-owned direct investment income from US multinational companies. This will lead to an underestimate of the amount of profit shifting.
3. Country by Country Income Series (Full Sample). **Positives:** This series was designed to reveal transfer pricing risk assessment issues, and it contains most of the relevant measures for such assessment, including sales, employment, and assets, as well as tax paid, tax accrued, before-tax profit, and accumulated earnings. Country coverage is excellent, with little missing data, and more than twice as many countries without missing data. Some important havens are visible that are missing from the BEA data set. Given the purpose of these data, companies should have no incentive to overreport income in haven countries. **Negatives:** One line of the data, stateless income, is difficult to interpret. Some of the stateless income may be double-counted versions of income on other lines of the report. Mergers or acquisitions may result in confused reporting for some companies. In the US data, revenue is defined to exclude intercompany dividends, but there may be ambiguity regarding how profit is defined that could lead to mismeasurement.[63] The data are new, and there remain concerns that companies may not be certain how to best complete these forms.
4. Country by Country Income Series (Positive Profit Sample). This series has the same positives and negatives as the full sample. There is one additional issue, discussed immediately below.

In the case of all the first three data sources, there is also an issue concerning the aggregation of data from many companies, which combines companies with losses and those with profits. This can lead to an overestimate of the effective tax rate, since taxes are paid only by profitable companies (typically) whereas the income in the denominator will include both profits and losses.

If all companies toggle back and forth between losses and profits nearly randomly, this issue is less of a concern, since effective tax rates may capture the medium-run tax burden faced by such companies over time. However, if some companies are persistently profitable, and others

[63] Revenue is defined to exclude intracompany dividends, implying that profit should also exclude that source of income. Still, the definition of profit may have originally been unclear, and in December 2019, the OECD issued updated guidelines clarifying that intracompany dividends should not be included in profit. Since the data are known to be used for transfer pricing risk assessment, it is unlikely that companies will have an incentive to overstate their income, especially in tax havens. Foreign totals are similar to those reported from other sources that are known to exclude double-counting. See footnote 55 for more on this issue.

persistently show losses, using aggregate data will bias estimates of effective tax rates upward, and bias estimates of profit downwards, lowering the estimates of profit shifting.

In practice, we know that companies differ in their time path of losses and profits, so focusing (in part) on those companies with profits makes sense, when such data are available. However, how best to weigh these two series will depend on further empirical investigation regarding the persistence of profits and losses for US multinational companies. For now, I also analyze the positive profit sample, reporting results that average those findings with those for the full sample.

No data set is perfect, but we can learn about plausible magnitudes by comparing estimates across data sets. On balance, the above considerations lead me to suspect that the subtracted income data series, while providing a lower bound, will underestimate the scale of profit shifting by omitting some foreign-to-foreign shifting. Since not all haven income is allocated to the United States in the counterfactual without profit shifting, foreign-to-foreign profit shifting is important, even if one is only interested in revenue consequences for the United States.

The direct investment income series may also be low, since we are only capturing the US-owned share of US MNC foreign income. There are also some measurement issues, although it is hard to discern the direction of bias from such issues.

The full sample of country-by-country data could include some double-counted income, if the stateless income line is included, so I exclude it in all analyses for now. Merger activity or other measurement issues may also be important and could distort total income numbers. As Table A1 indicates, however, in 2017 total income from this series ($638 billion) is similar to that of the other two series above that we know have no double-counting and may in fact have sources of underestimation ($571 billion and $575 billion). Total income is *far* lower in these series than in the BEA series that includes double-counting, the net income series, which shows $1.4 trillion in profit in all foreign countries in 2017. Thus, I suspect that the overall magnitude of the country by country data series is reasonable. Of course, the positive profit total is higher ($874 billion), but unlike all of the other series, that series excludes companies with losses.

For these reasons, my preferred estimates are those that employ either the country by country profit series or the direct investment income series.

Empirical Approaches

The first method attempts to identify profit shifting by considering the discrepancy between the real and financial activities of US multinational companies. The method is quite simple. For each jurisdiction with an effective tax rate below 10 percent, I ask how much less profit would be earned if the jurisdiction instead reported the same profit per employee as US multinationals report for all countries.[64] For example, using the country by country full sample series, profit per worker in Singapore is $337,000. If there were instead $50,500 of profit per worker (the average across all foreign countries), that would imply about $46 billion less earned in Singapore.

[64] For example, in 2017, the country by country income series shows $50,500 in profit per worker across all foreign countries. These ratios are calculated separately for each data set. Tørsløv, Zucman, and Wier (2018) also focus on profit to wage ratios in their assessment of profit shifting magnitudes.

Even focusing only on the lowest tax countries, this method indicates massive reductions in excess profits in haven countries, which implies large revenue gains for non-haven countries. As Table 1 indicates, however, the gains depend a lot on the data set. The country by country data show the most haven countries, and the largest revenue gains, including gains for $7 billion from Isle of Man, $12 billion from Jersey, and $31 billion from Puerto Rico (in the full data set). For the direct investment income series, all revenue pick up comes from five havens; for the adjusted income series, only four havens are involved.

Table A3: Plausible Indicators of the Magnitude of US MNC Profit Shifting in 2017
(This is identical to Table 1 from text. It is included here for easy reference.)

	Direct Investment Income Series (balance of payments data; adjusted to be pre-tax)	Adjusted Income Series (removes equity income from income, using BEA survey data)	Full Country-by-Country Sample (without stateless income)	Average of Full and Positive Profit Country-by-Country Sample (without stateless income)
Assign all havens[65] the world average profit/employee ratio	$79 billion	$61 billion	$96 billion	$118 billion
Remove tax elasticity; reallocate current profits, linear elasticity	$75 billion	$67 billion	$96 billion	$122 billion
Remove tax elasticity; reallocate current profits, nonlinear elasticity	**$89 billion**	$76 billion	**$109 billion**	**$141 billion**

Note: Table shows the full revenue costs due to the profit shifting of US MNCs to both the United States and other foreign (non-haven) countries, assuming shifted profit would have been taxed at pre-TCJA US tax rates. For comparison, US corporate tax revenues for fiscal year 2017 were about $297 billion, using CBO data.

This method presumes that, were it not for the low tax rates, havens would report similar profits per employee as the average foreign ratio, and the excess profit in havens is due to profit shifting. Absent such shifting, the same profits would be earned but would instead be reported in other high-tax countries. As I describe in the text, I only attribute 2/3 of the profit in Table 1 to the United States, reflecting that US MNCs have about 2/3 of their economics activities in the United States. However, since foreign companies also engage in profit shifting, when considering the overall consequences of profit shifting for the US government, foreign MNC profit shifting should be added, which suggests scaling up the number accordingly.

[65] Havens are defined as those countries with effective tax rates less than ten percent.

In general, this method is likely to be a low estimate since it ignores any excess profits in countries with effective tax rates over ten percent, but it is a useful starting point.

A second, more sophisticated, method uses an assumed tax rate semi-elasticity of 3 to calculate counterfactual profits. The tax elasticity captures the responsiveness of profits to tax rates, holding constant other considerations that should affect profits across countries, such as the scale of company activities as well as the special nature of particular countries. This elasticity is slightly below that found in my preferred specification (3.2), which regresses the natural log of direct investment income on the effective tax rate, log employment, log employee compensation, and log assets, controlling for country-specific fixed effects. This elasticity is a simple benchmark and readers can scale the estimate up and down accordingly with simple multiplication.

Any elasticity from a pooled or cross-section analysis of any one of these four data sets would be higher. Unfortunately, due to the limited time dimension of the country by country data set, a fixed effects specification is not possible using those data.

Further, nonlinear elasticities are likely appropriate, as persuasively argued by Dowd Landefeld and Moore (2017).[66] Using nonlinear elasticities would also lead to larger estimates; they also improve the explanatory fit of the regression. That is the method used in the final row of Table 1; those elasticities are quite similar to those reported in Dowd, Landefeld and Moore (2017).

These elasticities are used to eliminate the tax responsiveness of profits, limiting the sample to jurisdictions with tax rates between zero and 50 percent. (Losses and small idiosyncratic instances can otherwise generate outlier tax rates.) That tax responsiveness is then used to calculate counterfactual profits abroad, following the method of my prior work in Clausing (2016a, 2020b). The loss of profits in havens if capped at the current profits in such countries, as in prior work. Thus, there is no change in the overall amount of profits under these calculations, just a relocation of profits from low-tax countries toward higher-tax countries. To match my prior work with this method, I assume a 30 percent effective US tax rate, allowing for some base narrowing relative to the statutory rate.[67]

Again, there should be some adjustment downward to account for the fact that some haven income belongs abroad rather than in the United States. Both the BEA and country-by-country data suggest that about two-thirds of the economic activity of US MNCs occurs in the United States, so that is the fraction of excess profits I attribute to the United States. When considering the overall magnitude of profit shifting, there should also be some adjustment upward for the profit shifting of foreign multinational companies. As discussed in the text (p. 10 and fn. 19), together these adjustments imply a revenue cost to the US government from profit shifting that is 95.5 percent of the numbers in Table A3.

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[66] This nonlinearity is quite visible to anyone who looks closely at these data; most foreign profits are concentrated in the lowest tax countries. The country-by-country data show 56% of accumulated profits in just a handful of haven countries.

[67] Using the statutory rate instead would match the other method and increase the estimate accordingly. In addition to the higher tax rate on the reassigned income, the calculated amount of profits abroad also changes, due to the higher discrepancy between the US and the foreign rate.

Other Studies and Sources

The findings of this appendix are compatible with the large magnitudes of profit shifting suggested by other recent research. None of those studies use data that includes double-counting. Guvenen et al (2018) use macroeconomic data, together with US BEA data on direct investment earnings, and find that earnings are misattributed across countries due to profit shifting. In 2012, this implies that the US tax base should be about $280 billion larger, with correspondingly smaller tax bases in many haven countries. Zucman (2014, 2015) also suggests large US revenue losses due to profit shifting. Tørsløv, Wier, and Zucman (2018) use macroeconomic data on foreign affiliate statistics, estimating that about 40 percent of multinational profits are shifted to tax havens each year, and that this profit shifting has a substantial impact on macroeconomic statistics.

Bilicka (2019) has a particularly illuminating study that relies on UK confidential corporate tax return data. Using these data, she finds that foreign multinationals underreport their UK profits by about 50 percent, and that eliminating differences in reported taxable profits would lead to revenue gains of 62 percent in 2014. While these estimates are large, they are also conservative, since her matching method requires her to exclude the largest multinational companies from the analysis.

Bilicka's work also indicates that utilizing accounting data underestimates the size of the profit shifting problem; companies report zero taxable profits in many instances where they report positive accounting profits. The study suggests an additional reason why firm level data does not find large effects of profit shifting: the importance of zero taxable profits in the data. This finding supports the importance of the fixed costs associated with profit shifting; companies may not respond smoothly to variations in tax rate differences.

That insight is compatible with the nonlinear elasticities emphasized in Dowd, Landefeld, and Moore (2017) as well as the above estimates of profit shifting. The vast majority of profit shifting appears to be destined for a small handful of tax havens (or "investment hubs", to be diplomatic). There is relatively less tax responsiveness in the data among higher-tax rate countries.

This large scale of profit shifting is also compatible with the large estimates of the revenue loss due to deferral under the prior US tax system (though those are distinct concepts), the large estimates of revenue loss due to base erosion found by the OECD (2015), and the large scale of the profit shifting problem noted by IMF researchers, including Crivelli et al. (2016), who find particularly large revenue losses for developing countries (as a share of GDP).

Appendix B

Below are estimates considering the effect of the GILTI global minimum tax, depending on the fraction of foreign income held by companies with deficit credits with respect to the tax.

Table B1: Changes in Corporate Tax Base Due to GILTI Global Minimum Tax

	BEA DII Series		**IRS CbC Series**	
	Tax Base Change, billions	Tax Base Change, percent	Tax Base Change, billions	Tax Base Change, percent
Baseline: 50% of Income Held by Deficit Credit Companies				
Min Tax Countries	-35.9	-11.7%	-55.1	-15.5%
Others, Non-Havens	18.3	8.1%	21.6	9.1%
Of which: Rich	13.0	8.0%	12.2	23.6%
Non-Rich	5.4	8.1%	9.5	5.1%
U.S.	16.6		29.8	
U.S. Revenue ($b)	3.3		6.0	
Alternate: 10% of Income Held by Deficit Credit Companies				
Min Tax Countries	-7.1	-2.3%	-11.0	-3.1%
Others, Non-Havens	3.6	1.6%	4.3	1.8%
Of which: Rich	2.6	1.6%	2.4	4.7%
Non-Rich	1.1	1.6%	1.9	1.0%
U.S.	3.3		6.0	
U.S. Revenue ($b)	0.7		1.2	
Alternate: 90% of Income Held by Deficit Credit Companies				
Min Tax Countries	-64.7	-21.1%	-99.2	-27.9%
Others, Non-Havens	33.0	14.5%	39.0	16.3%
Of which: Rich	23.3	14.5%	22.0	42.5%
Non-Rich	9.7	14.7%	17.0	9.1%
U.S.	30.0		53.7	
U.S. Revenue ($b)	6.0		10.7	

Note: This analysis considers the steady-state effect on tax bases from the reduced profit shifting due to the GILTI. The change in revenue above is calculated at a 20% marginal effective tax rate. Data are from 2017.

Appendix C:

Table C1 shows simple mechanical estimates of the revenue gain associated with higher per-country minimum taxes for the four data series. The method behind this table is simple. For each country with an effective tax rate below the minimum tax rate, the difference between the minimum tax rate and the country's effective tax rate is multiplied by the profit in that country. Two-thirds of the resulting revenue is allocated to the United States, reflecting the fact that US multinational companies undertake about two-thirds of their economic activity in the United States.

The remaining revenue ends up in other non-haven countries, due to reduced profit shifting under the minimum tax. Due to a reduced incentive to shift profits, the pattern of taxable profits across countries is likely to change, more closely reflecting the underlying location of economic activity. Thus, havens will lose tax base and non-havens will gain tax base. Thus, over time, the U.S. minimum tax revenue will partially show up as increased domestic corporate tax base (rather than minimum tax revenue), due to adjustments in the distribution of taxable profits.

Table C1: US Revenue from a Per-Country Minimum Tax in 2017

	Direct Investment Income Series (balance of payments data; adjusted to be pre-tax)	Subtracted Income Series (removes equity income from income, using BEA survey data)	Full Country-by-Country Sample (without stateless income)	Average of Full and Positive Profit Country-by-Country Sample (without stateless income)
21 percent	$30b	$24b	$41b	$53b
28 percent	$49b	$43b	$64b	$81.7
35 percent	$71b	$66b	$89b	$113b