Double counting accounting:

How much profit of multinational enterprises is really in tax havens?

Jennifer Blouin, University of Pennsylvania (Wharton)

Leslie Robinson, Dartmouth College (Tuck)

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Abstract: Putting an end to the base erosion and profit shifting (BEPS) activity of multinational enterprises (MNEs) is on the national agenda of nearly every country in the world. While many influential papers suggest that the scope and magnitude of the BEPS problem is quite large, we show that these magnitudes are likely overstated due to the accounting treatment of indirectly-owned foreign affiliates in the BEA's U.S. international economic accounts data. We explain how this accounting treatment leads to double counting of foreign income and to misallocations to the incorrect jurisdiction. We demonstrate an appropriate correction, and show that the correction significantly reduces the magnitude of the BEPS estimates. For instance, our correction reduces an estimate of the U.S. fiscal effects of BEPS from 30-45% to 4-15% of corporate tax revenues lost to BEPS activity of MNEs (Clausing 2016). Our work has far-reaching implications, as the U.S.' national statistics have a unique accounting convention that can make comparisons of the U.S. national statistics to those of other countries difficult to interpret.

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1. Introduction

Under the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS), over 125 countries are collaborating to put an end to tax avoidance strategies that exploit gaps in tax rules to artificially shift profits to low or no-tax locations. One of the BEPS project action items, Action 11 Report (OECD 2015), *Measuring and Monitoring BEPS*, focuses on gathering and improving the data and analyses that are intended to capture the quantitative impact of BEPS and BEPS counter measures. The range of estimates of annual global tax revenue losses due to BEPS is very large (see Bradbury et al. 2018): from less than $100 billion to more than $600 billion. Country-specific estimates of BEPS fiscal effects also vary widely with recent studies reporting U.S. tax revenue losses in the range of $57 billion to $188 billion per year (see Tørsløv et al., 2019). Given the policy ramifications, there has been an extraordinary amount of effort put forth in developing methods to both measure and mitigate abusive tax planning behavior.

The objective of our paper is to improve the measurement of BEPS and its global fiscal effects. Our review of the literature on U.S. multinational enterprises' (MNEs) profit shifting led to our discovery of several measurement issues that all bias estimates of BEPS upwards. We also identify a simple solution to these measurement concerns. To illustrate the impact of our adjustment to resolve the issues, we offer revised estimates of the U.S. revenue lost to BEPS that are on average only one third of those found in the literature. As researchers begin studying the short-term and long-term impact of the 2017 U.S. tax reform on BEPS, using data without understanding its limitations, our work is both timely and salient.

Our study focuses on examining BEPS research that uses data collected by the U.S. Bureau of Economic Analysis (BEA); data described by the OECD as 'best practices in available data for BEPS analysis" (OECD 2015, p. 35) and recognized by the IMF as "a major information source for macro studies" (Beer, de Mooij, and Liu (2019), p. 15). BEA data is the source of the U.S.'s

national statistics on inbound and outbound business activity and is often used in profit shifting studies. The data offer two income measures that each suffer from problems that limit their usefulness in estimating the location of U.S. MNEs' profits. Our paper highlights why existing interpretations of these measures are flawed and, unless our recommended adjustments are made, the resulting evidence using these data is misleading. With improved accessibility to BEA micro-data at Federal Statistical Research Data Centers in 2019, one immediate concern is that future work on the effects of policies intended to combat BEPS that uses U.S. international economic accounts data will draw incorrect inferences.[1]

Much of the public discourse surrounding profit shifting is fueled by simple descriptive analyses generated from the aggregate BEA statistics. For instance, Zucman (2014; 2015) reports that 55 percent of foreign affiliate profits were in tax havens in 2013, Clausing (2016) reports that 50 percent were in havens in 2012, and Sullivan (2004) reports that 58 percent were in havens in 2002. As noted in Dharmapala (2014), it has become increasingly common to point to the fraction of the income of MNEs' reported in tax havens as "self-evidently demonstrating *ipso facto* the existence and large magnitude of BEPS (pg. 2)".[2] However, there is a body of empirical work suggesting that a more modest level of profit shifting should be observed in descriptive data. Dharmapala's premise is that the profit-shifting work appears to be at an impasse: A handful of influential papers document sizeable U.S. MNE profits in havens implying significant revenue losses that simply cannot be reconciled to the findings of much of the empirical profit shifting literature.

[1] https://www.bea.gov/research/special-sworn-researcher-program. An important area for future research would be to analyze profit shifting using the BEA micro data and the measure of income we propose in this study.
[2] Other authors offer similar statistics using aggregate Treasury data such as Gravelle (2015) who reports that U.S. MNC foreign affiliate profits were 1,614 percent of Bermuda's GDP and 2,066 percent of the Cayman Islands GDP in 2010. We address similar measurement issue with Treasury data as well in Section 5.

Most of the empirical profit shifting research identifies BEPS by studying the tax sensitivity (or elasticity) of reported income. In the absence of taxes, researchers typically assume that a given level of capital, labor and investment opportunities should yield similar amounts of income even in different countries. Once taxes are introduced, evidence of higher pre-tax profits in jurisdictions with lower tax rates is consistent with profit shifting. A consensus estimate from the literature, based on a meta-regression study by Heckemeyer and Overesch (2013), is a semi-elasticity of reported income with respect to the tax rate differential across countries of 0.8. This means that a firm with $1,000,000 of pre-tax profits in a jurisdiction reducing its tax rate from 35 to 25 percent would shift an additional 8 percent or $80,000 of income into that jurisdiction.

Ultimately, our study reconciles the findings of profit shifting work using aggregate BEA data and work using elasticities. We explain that the large share of BEA aggregate income reported in tax havens is due to a significant misinterpretation of the BEA's U.S. international economic accounts data. The confusion stems from the accounting treatment of the activity of U.S. MNEs' indirectly owned foreign affiliates.

For BEA reporting, a foreign affiliate (parent) that owns another foreign affiliate (affiliate) will be required to report the income of the affiliate on its own income statement. This income on the foreign parent's books is referred to in the BEA data as the equity income from investments. Equity income only arises from foreign affiliates that are indirectly-owned owned by the U.S. parent (i.e., affiliates owned by other foreign affiliates directly held by the U.S. parent). Equity income is neither dividend income nor does it represent an asset (cash or otherwise) flow between a foreign parent affiliate and its affiliate. It is only an accounting construct that is necessary because national statistics require MNEs to report affiliate-level financial information by jurisdiction.

Over the last 30 years, equity income has been a large and growing component of the BEA data series. This in large part is due to U.S. MNEs' ownership structures becoming complex with more tiers (or layers) of indirectly-owned foreign affiliates (see Lewellen and Robinson 2014; Blouin and Krull 2019). For example, in 1990 equity income represented 27% of aggregate foreign affiliate net income but, in 2016, equity income comprises 67 percent of the aggregate foreign affiliate income for U.S. MNEs. This means that in 2016 two-thirds of foreign profits are reported in at least two different countries – once in the country of the parent affiliate and once in the country of the affiliate that generated the profit from its underlying operations. A further complexity arises for work on profit shifting because equity income tends to be disproportionately in tax havens.[3] Equity income's growth in tax havens stems from the use of tax havens as foreign holding companies. Although their existence is certainly attributable to tax planning incentives, these tax haven affiliates' largest assets are typically their ownership of other foreign affiliates that generate profits elsewhere.

The first discussion of the BEA data's "double counting" of equity income in the academic literature can be traced to Altshuler and Grubert (2006). While the authors are correct that unadjusted BEA income will duplicate the reporting of the equity income in the data, they mistakenly explain that equity income represents an intercompany dividend. This misinterpretation then persists over time by economic analyses found in studies such as Yorgason (2009), Clausing (2009, 2011, 2016, 2018), GAO (2008), and Beer et al. (2018). Clausing, one of the most prolific authors on the U.S. fiscal effects of BEPS using BEA data, claims that it is not possible to correct for the double counting problem and proposes a solution that she emphasizes should be viewed as an overcorrection. We show that in addition to accounting for the same dollar

[3] Borga and Mataloni (2001) point out that the increasing use of tax haven entities serving as foreign affiliate parents make it increasingly challenging to infer the economic activity of U.S. MNEs using BEA data

of income multiple times, equity income also affects researchers' ability to infer where the income is generated (or earned) as well as the estimated tax rate faced in the jurisdiction.

How overstated shares of income reported in tax havens translate into fiscal effects depends on the underlying data and the methodology. But, to date, each of the papers studying the aggregate revenue lost to BEPS fails to correctly consider equity income in their analyses. For example, Clausing (2016) offers a lower and upper bound estimate of the U.S. corporate tax base lost to BEPS in 2012 of 30% ($77 billion) and 45% ($111 billion).[4] Once we adjust the BEA's income measures for equity income, we estimate the U.S. corporate tax base lost to BEPS in 2012 of between 4% ($10 billion) and 13% ($32 billion). Similarly, Zucman (2015, p. 105-106) fails to adjust for equity income in his analysis of the 2013 BEA data leading to his conclusion that 55 percent of foreign affiliate income is earned in tax havens resulting in a revenue loss of $130 billion a year (41.4% of U.S. tax revenue in 2013). Our revised estimate *using his methodology* is only $80 billion (25.4% of U.S. tax revenue in 2013).

We also want to highlight that the double counting issue that we address is endemic to all countries' national statistics. Any economic data that requires business entities to break down their reporting by jurisdiction must have an established methodology to report the activity of the indirectly-owned affiliates of its MNEs. Our preliminary reviews of other countries' instructions for reporting of their national statistics suggest that many countries use a methodology different from that of the U.S. It appears that the U.S.'s equity income accounting method makes it an outlier in the international community. Since the U.S.'s reporting conventions of its indirect affiliates varies from other countries' reporting, work that compares U.S. aggregate national statistics to the aggregate national statistics of other countries is also biased (e.g., Tørsløv et al. 2019).

[4] All of the published studies by Clausing refer to the higher estimate as the "main" estimate, while the lower estimate is referred to as the "alternate" estimate.

Additionally, inferences drawn from work suggesting that BEPS alters the measurement of GDP growth (e.g., Guvenen et al. 2019) must also be revisited.

We note that caution is warranted when analyzing profit shifting using other data sources such as Bureau van Dijk and U.S. tax data. Each of these sources report financial data for MNEs' foreign affiliates that must account for the activity of other indirectly-owned affiliates. Overall, we conclude that researchers must take care when making comparisons of profit shifting activity using samples of affiliates of MNEs with different parent home countries.

Our paper proceeds as follows. First, we provide a background on the BEPS literature and, in particular, studies that estimate fiscal effects. Second, we explain the accounting method for indirectly-owned affiliates used for BEA reporting and how it affects the two BEA data series commonly used in profit shifting studies. In the next two sections, we describe how studies using each of these data series incorrectly arrive at misleading and implausibly high estimates of the scale of BEPS. We close by discussing the potential knock-on effects of these issues in future work and the use of non-BEA data sources to estimate BEPS.

2. Background and related literature

Academics, governments, and policy organizations are all very active in producing empirical studies examining profit shifting. Recent reviews of the empirical work in this area by Dharmapala (2014), Riedel (2018) and OECD (2015) conclude that, despite using different data sources and estimation strategies, over one hundred studies report evidence in line with tax-motivated profit shifting. A common theme in these studies is that reported profits are sensitive to tax rates (i.e., semi-elasticity estimates) and that there is a disconnect between the jurisdictions where MNEs are recording their profits and the locations where the economic activities that

generate those profits are taking place (e.g., Dharmapala and Riedel 2013; Dischinger and Riedel 2011; Hines and Rice 1994; Huizinga and Laeven 2008). While there is little disagreement that BEPS is occurring, there is a lack of consensus over the scale or extent of profit shifting activity.

From a tax policy perspective, the scale of the tax revenue losses incurred globally, and by individual countries, is extremely salient. Yet, until now, few academic researchers have chosen to extend their estimates of the profit shifting responses to producing fiscal estimates. OECD (2015) notes Bach (2013), Clausing (2009) and Vicard (2015) as exceptions that have taken the additional steps to extend empirical estimates of elasticities to the magnitude of revenue foregone by governments. Since the OECD report, however, many more studies have presented country-level estimates of revenue losses due to profit shifting: Zucman (2014,2015), Clausing (2016), Tørsløv et al. (2019), Cobham and Jansky (2018), Jansky and Palansky (2019), Guvenen et al. (2019), Bolwijn et al. (2019) and Bilicka (2019). Moreover, at least three international organizations have recently developed estimates of the budgetary impact of international corporate tax avoidance for most of the world economy including the OECD (2015), the IMF's Crivelli et al. (2016) and UNCTAD (2015).

What is interesting to note about this wave of recent studies is that the range of estimates varies widely (see Bradbury et al. 2019 for a summary of this literature). Globally, the estimates range from less than $100 billion in Jansky and Palansky (2019) to more than $600 billion in Crivelli et al. (2016). For just the U.S., the estimates range from $57 billion annually in Tørsløv et al. (2019) to $189 billion in Crivelli et al. (2016) and Cobham and Jansky (2017), with Clausing at $94 billion. Even estimates by the same author will vary over time. For instance, Zucman (2014, 2015) reports a U.S. revenue loss to BEPS of $130 billion annually, but in

Tørsløv, et al. (2019), the U.S. revenue loss to BEPS is $57 billion. To put things in perspective, some estimates of shifted profits are sometimes higher than the amount of profits in MNEs.

Clearly the estimates depend on the data and methodology. The data available for BEPS analyses ranges from highly aggregated data such as those in national accounts to more granular information available in company financial statements or tax returns. Macroeconomic data such as national accounts, balance of payments, foreign direct investment, trade and customs data, and corporate income tax revenues, are becoming increasingly common because they are publicly available for a variety of countries through national statistical offices or international organizations. Whereas macroeconomic data have the advantage of being readily available with broad coverage, many other profit shifting studies make use of firm-level microeconomic data. These data generally improve researchers' ability to analyze specific BEPS channels or control for observable or unobservable determinants of an MNE affiliate's income.

In general, most studies attempting to derive global fiscal estimates of BEPS tend to use macroeconomic data. This is due to a combination of data accessibility, the desire to include developing countries and tax havens in the analysis (where micro data are generally lacking), and the desire for comparability across countries. The source of U.S. macroeconomic data is the BEA. Hines and Rice (1994) appear to be among the first authors to use the aggregate BEA data to investigate the role of tax havens on U.S. corporate tax collections.[5] Despite this recent trend towards using macroeconomic data, there appears to be little focus on the fact that many countries aggregate statistics derive from micro-level financial (or sometimes tax) data. For instance, the BEA published aggregates derive from affiliate-level financial statement information. This is

[5] In the mid to late 90s, the BEA began allowing academic researchers access to the firm-level data underlying the aggregate data published publicly. For example, Desai, Foley and Hines (2006) revisit Hines and Rice (1994) using micro-data for their empirical analysis. Unfortunately, being approved for access to the micro data is difficult and it is costly to use the data as all analyses must be performed at the BEA's offices in Washington DC area.

important because there is a broad literature in accounting describing the wide range of discretion that firms in various countries have in measuring income.

One of the most important assumptions underlying work on profit shifting is that the researcher can directly observe, or has a reasonable proxy for, the amount and location of income reported in various jurisdictions. Financial statement information is a widely accepted proxy for the location of taxable profits because tax return information is difficult to access (and sometimes itself is a derivative of financial statement data). As we discuss below, researchers using macroeconomic data to infer the amount and location of reported profits must exercise care in understanding how those profits are measured, particularly when comparisons are made across countries.

3. A discussion of U.S. international economic accounts

The U.S. BEA publishes annually various aggregate statistics from international economic accounts. In particular, the BEA publishes two data series that provide information about the profitability of foreign affiliates of U.S. multinational enterprises (MNEs): (1) activities of MNEs and (2) balance of payments and direct investment position data.[6] Both data series are derived from accounting information collected in surveys of U.S. MNEs that are conducted by the BEA. Reporting on BEA surveys is mandatory under the International Investment and Trade in Services Survey Act (P.L. 94–472, 90 Stat. 2059, 22 U.S.C. 3101–3108, as amended). The Act protects the confidentiality of the reported data. The assurance of confidentiality is essential to securing the cooperation of reporting firms and, thus, to maintaining the integrity of the statistical system. U.S. MNEs provide separate company financial statements for each foreign affiliate that exceeds a

[6] (1) https://www.bea.gov/international/di1usdop; (2) https://www.bea.gov/international/di1usdbal

certain size threshold. Benchmark surveys, conducted every five years, have lower reporting thresholds.[7]

All BEA survey forms require that U.S. MNEs report financial statement data using U.S. Generally Accepted Accounting Principles (GAAP). The only variation from GAAP is that the BEA requires that MNEs use the equity method of accounting to record all activity associated with investments in foreign affiliates. The equity method of accounting is one of three methods offered by U.S. GAAP for capturing the return on equity investments in affiliated companies. When one entity in an affiliated group (i.e., under common control) is a shareholder of another entity in the group, these accounting methods dictate how this parent-affiliate relationship will be reported in the financial statements of the parent company. In the context of U.S. MNEs, the parent company is commonly thought of as the U.S. parent, but foreign affiliates may also be parent companies in the BEA data. Under these accounting rules, when a foreign affiliate is owned indirectly by the U.S. parent, the foreign affiliate's direct foreign owner will be treated as a foreign parent. Properly using the two BEA data series to study profits shifting requires researchers to have an understanding of the equity method of accounting.

3.1. The equity method of accounting

The equity method of accounting is best understood by contrasting it with the other two methods available under U.S. GAAP – consolidation and the cost method. We focus only on the income statement effects, although the balance sheet will differ as well across the three accounting methods.[8] The *consolidation method* requires that a parent company report all of the revenues and expenses of its affiliates along with its own activity in its financial statements. Each line item on

[7] See https://www.bea.gov/data/economic-accounts/international

[8] For instance, under equity method accounting, income from affiliates recorded on a parent company's income statement is balanced by an adjustment to the parent's investment asset in its affiliate on its balance sheet. Therefore, this accounting method also affects foreign direct investment *position* data.

the parent's income statement comingles the activities of the parent with that of all of its affiliates.[9] The *cost method* requires that a parent report only dividend distributions from its affiliates as income. The *equity method* requires that the parent report its percentage share of affiliate net income as a single line item on its income statement, often labelled for accounting purposes as "equity income". Equity income is recorded without regard to the timing of any dividend distributions.[10]

In Figure 1 Panel A, we present an example of the reporting of the activity of a U.S. MNE with a directly-owned foreign affiliate (in the Netherlands) and an indirectly-owned foreign affiliate (in Germany). In this structure, both the U.S. parent and the Netherlands affiliate are considered parent companies whose income statements will be affected by the equity method of accounting. In our example, we focus on how foreign affiliate profits are measured. Assume that the Dutch entity has $45 of net income related to its activities and the German entity has $280 of net income. For each entity, their pretax income was subject to tax in its country of origin. In addition, assume the German affiliate pays a $10 dividend to its Dutch parent. Since the Netherlands uses an exemption system it does not tax the $10 dividend from Germany.

In Figure 1 Panel B, we show how each accounting method affects the reported income of both affiliates. Under the consolidation method, all of the activity of the Dutch and German entities

[9] Note that any related party transactions are netted out or "eliminated" so that items on a consolidated income statement represent only activity with independent parties. Only entities operating within the same country may use consolidation for BEA reporting.

[10] The survey instructions for both the U.S. parent and each of its foreign affiliates clearly state that the equity method of accounting must be used in nearly all cases. The following is an excerpt from the foreign affiliate survey: Method of accounting for equity investments – Forms BE-11B, BE-11C and BE-11D. DO NOT CONSOLIDATE FOREIGN SUBSIDIARIES, BRANCHES, OPERATIONS, OR INVESTMENTS NO MATTER WHAT THE PERCENTAGE OWNERSHIP. – Report a foreign affiliate parent's equity investments of 20 percent or more in unconsolidated foreign affiliates, including all unconsolidated majority-owned foreign affiliates, using the equity method of accounting. Report equity investments of less than 20 percent, in accordance with FASB ASC 320 (FAS 115) or cost basis of accounting. Entities operating in the same country may use consolidation. Equity investments of between 10 and 20 percent must use the cost method, but these are relatively rare. Equity investments less than 10 percent are treated as portfolio investment rather than direct investment and are not in these data.

would be comingled and reported in the Dutch affiliate's income statement. No information would be available about the German affiliate including information revealing that income in the Netherlands includes German activity. Under the equity method, the German entity reports its activity but the Dutch affiliate reports its share of the Germany income on its books along with its own activity. The income statement of the Dutch entity will report the German income as "equity income". Notice that under the equity method aggregate foreign activity is overstated by $280. The cost method reports income only when distributions are made to the parent. Since the Dutch entity received a $10 dividend it will report the dividend along with its own activity. Effectively, the $10 of income attributable to the dividend is duplicated in the aggregate data. Note that under both the equity method and the cost method that some income of the German affiliate will reported multiple times in multiple countries.

3.2. Activities of U.S. MNEs data: ***Net Income***

This BEA data series on the activities of U.S. MNEs provides a picture of the overall activities of foreign affiliates and their U.S. parent companies. The measure of income provided in this data series is called **Net Income (NI)**, a financial accounting measure of profit for each affiliate. These statistics offer a variety of indicators of the financial structure and operations of U.S. MNEs by obtaining an income statement and balance sheet for each foreign affiliate as well as the U.S parent. This information is used by the BEA to analyze the characteristics, performance, and economic impact of MNEs. The findings are published monthly in the *Survey of Current Business*, a BEA publication that includes a variety of articles, including detailed presentations about recent data releases, explanations of annual and benchmark updates, and explanations of key

methodologies.[11] Affiliates are included in these data so long as the affiliate is owned at least 10 percent by the U.S. parent (the threshold to be considered direct rather than portfolio investment).[12]

Figure 1 Panel C illustrates how the activity of the entity described in Panel A would appear to a BEA researcher using this data series. A researcher can only observe the amounts in *italics*. These data allow researchers to calculate the effective tax rates reported in Figure 1 Panel C. Notice that the NI amounts are identical to that described in the equity method example in Panel B precisely because this data series *is* financial accounting data for the majority-owned affiliates of U.S. MNEs using the equity method of accounting. Because of the equity method of accounting, this data series includes the $280 from the German affiliate in the aggregate statistics twice: once in Germany and again in the Netherlands.

3.3. Balance of payments data: ***Direct investment income***

The second of the two BEA data series is the balance of payments (BoP) data. The measure of income available in this data series is called **Direct Investment Income (DII)**. The BoP describes international economic transactions between the U.S. and the rest of the world.[13] The BEA compiles these statistics for the IMF, the OECD, UNCTAD and all the organizations that publish these statistics.

[11] https://apps.bea.gov/scb/index.htm

[12] The BEA publishes two separate series of aggregate statistics by country. The first includes all any foreign affiliate owned less than 50% (but more than 10%). These data are more limited since the BEA requests fewer data items for minority-owned affiliates (those for which the parent owns less than 50%). The second is for majority-owned foreign affiliates (owned 50% or more by the U.S. parent), where the BEA requires more detailed reporting, including information about equity income and tax expense. The amount of income reported by minority-owned affiliates is negligible compared to that reported in majority-owned affiliates (i.e., less than 2–3 percent).

[13] These are essential for the BEA in the compilation of, among other things, the U.S. international transactions accounts. Indeed, all countries maintain BoP data to monitor many social and economic objectives. To encourage international comparisons, most countries have largely conformed to international statistical guidelines for compiling BoP, the most recent of which is the International Monetary Fund Balance of Payments and International Investment Position Manual, 6th edition (BPM6). See a discussion of these guidelines from the BEA perspective https://apps.bea.gov/scb/pdf/2014/03%20March/0314_restructuring_the_international_economic_accounts.pdf

The BoP has many components. DII is a component of the capital account, which includes investment income on direct investment, i.e., debt and equity investments in a foreign affiliate by the direct investor.[14] The income, whether distributed or reinvested in the foreign affiliate, is proportionate to the direct investor's equity share in the affiliate. This points to an important difference between this data series and NI. Here, the focus is on U.S. parents' direct ownership shares in their affiliates rather than on the affiliates themselves. If an affiliate is 85-percent directly owned by its U.S. parent and has net income of $100, only $85 is included in DII. Similarly, if an affiliate is entirely indirectly owned by the U.S. parent via an intermediate affiliate, DII will report none of the indirectly-owned affiliate's activity will be reported in its home country.[15]

Returning to Figure 1 Panel C, we illustrate how the activity of the entity described in Panel A would appear to a BEA researcher using this data series. Only the net income of the directly owned foreign affiliate is reported (i.e., the amount in italics). No profits from Germany are observed at all. Information about tax expense is not captured in DII. Pre-tax income and effective tax rates cannot be determined. Perhaps most problematic is that the equity income reported in the Netherlands can no longer be separated from the income earned in the Netherlands. In this example, 86 percent of the DII in the Netherlands is actually income from an investment in Germany.[16]

3.4. Using BEA data to study profit shifting: Our recommendation

Our objective is to propose a simple and transparent correction to the BEA data that results in measures that are useful for researchers studying profit shifting. Above, we highlighted why the

[14] Income on debt and equity investment abroad in unaffiliated entities is considered portfolio income, a separate component of BoP. Ownership of 10 percent or more constitutes a direct investment.
[15] The sole exception is that direct investment income includes net interest income held on any intercompany balances between the U.S. parent and any indirectly held affiliates.
[16] We are not the first to point this out. Countries recognize the issue and sometimes report alternative FDI statistics based on ultimate beneficial owner. https://www.bea.gov/international/di1fdibal However, this is not standard practice and is viewed as additional FDI statistics rather than traditional FDI statistics.

two BEA income measures – NI and DII – suffer from problems that limit their usefulness in achieving this objective. NI double counts profits, while DII does not source income to the appropriate countries and is only reported after-tax.

Our recommended measure of income for BEPS analysis is **Adjusted Net Income**. This measure simply removes equity income from NI. In Figure 1 Panel C, we show that this measure of income results in both income being reported in the country where it is earned and the correct computation of the tax rate. Adjusted Net Income can be transformed into a pre-tax income (called adjusted Pre-Tax Income which is Adjusted Net Income plus tax expense) measure because the tax expense shown in the data now maps to Adjusted Net Income.

In Figure 2, we revise Figure 1 from Clausing (2016) that plots the share of aggregate pre-tax income (PTI), estimated as NI plus tax expense, and DII in several tax haven countries. Our figure includes our proposed measure, adjusted Pre-Tax Income (Adj. PTI). When equity income is removed from affiliates' PTI, the proportion of income reported in many of the tax havens drops significantly but the income in two of the U.S.'s largest trading partners, Canada and the UK, changes little. Notice that Figure 2 illustrates that although DII does not double count income, it similarly overstates the *proportion* of income earned in tax havens. It is important to note that even where the proportion of income is roughly the same under each measure – e.g., Switzerland – the PTI and DII measures may still overstate income in those countries.

The same mistake appears in Zucman (2014, 2015) that highlights the share of income earned in tax havens using DII. In Figure 3, we revise Figure 2 from Zucman (2014) to include our Adj. PTI measure. As illustrated in Figure 2, once equity income is properly accounted for in the data, the amount of income reported in the Netherlands falls precipitously but Ireland's share increases. Zucman (2014) reports that approximately 55 percent of all foreign profits in 2013 are

in the handful of tax havens reported in this plot; the actual percentage of profits generated in these countries is 35 percent.

3.5. The increasing importance of understanding equity income

The importance of considering equity income for BEPS analyses is of growing significance. First, equity income is not equally distributed across countries. Rather, it is concentrated in tax havens. The reason is that firms often place tax haven affiliates in the upper tier of their foreign ownership structure for tax planning purposes (e.g., see Lewellen and Robinson, 2014). This is likely due, in part, to check-the-box regulations issued by the U.S. Treasury department that incentivized tiered structures for tax planning (see Blouin and Krull, 2019). Figure 4 shows that the share of aggregate equity income in the BEA data became more concentrated in tax haven countries beginning in the early 2000s. This suggests that earlier studies such as Hines and Rice (1994) are less affected by the measurement issues we raise with respect to equity income than more recent studies such as Clausing (2016).

For example, in 2016, the most recent year of available data, the aggregate amount of foreign affiliate net income earned by U.S. MNEs $1,016 billion. However, $681 billion (67%) of that income is equity income. This means that 67% of 2016 aggregate NI is included in the data more than once.[17] That percentage has averaged 19, 31, 59, and 65 percent over the last four decades, respectively, illustrating the increasing importance of equity income in the data over time. Combining this fact with the observation that equity income occurs more frequently in tax haven countries, recent studies on profit shifting that fail to accurately take into account equity income will yield biased estimates of BEPS-related revenue losses.

[17] In all of our examples, we only report the existence of one indirectly-owned foreign affiliate (i.e., Germany). However, in the data, there are organizations that have up to 10 tiers of foreign affiliates. In this case, the net income of the bottom affiliate would be reported in the data 10 times.

4. Incorrect inferences using various measures of income from BEA data

4.1. Incorrect inferences using the 'Activities of U.S. MNEs' data (Net income)

To illustrate the ramifications of failing to understand equity income when measuring BEPS, we revisit the U.S. revenue loss estimates generated in Clausing (2016). The Clausing (2016) methodology has three critical inputs: (i) foreign affiliate profits, (ii) foreign effective tax rates, and (iii) the tax sensitivity of reported income. The first two inputs largely determine the tax sensitivity of reported income, or semi-elasticity. This semi-elasticity is then multiplied by the tax rate differential between the foreign affiliate and the U.S. parent to determine the tax responsiveness by country. That tax responsiveness is then applied to foreign affiliate profits to determine the change in the foreign tax base.[18] We explain how each of Clausing's inputs is affected by the measurement issues associated with equity income and offer a set of revised estimates.

4.1.1. Foreign affiliate profits

Clausing (2009,2011,2016,2019) do not appropriately capture the magnitude of foreign profits nor the country in which those profits were earned (and subject to tax). For illustrative purposes, assume that the example provided in Figure 1 represents aggregate BEA data for all U.S. MNEs. The appropriate distribution of foreign affiliate net income is $45 in the Netherlands and $280 in Germany. Without adjusting for equity income, one would infer (incorrectly) that $325 of net income was earned in the Netherlands and $280 was earned in Germany. The $280 earned in Germany is double counted. Clausing (2009, 2011,2016) report fiscal estimates using NI from the

[18] The total change in the foreign tax base is then multiplied by the ratio of foreign affiliate sales to parent firms in the U.S. relative to foreign affiliate sales to both parents and affiliated firms in other countries. There is also a gross-up adjustment for income shifted out of the U.S. by foreign-controlled MNEs. We discuss each step in Section 4.1.3.

activities of MNEs data that double counts foreign affiliate profits. These estimates are problematic because, as shown in our example, a significant amount of profits would be attributed to the Netherlands simply as an artifact of the equity method of accounting.

Clausing does recognize the issue of double counting, but maintains the view that the problem has no good solution. Clausing's understanding of equity income leads her to conclude that some equity income should be include in the measure of income used to detect profit shifting and some should not. But because Clausing sees no good way to separate the appropriate from the inappropriate equity income, she presents her estimates using NI as an upper bound and using DII as a lower bound. She presents these alternative estimates as a lower bound stating that they exclude all equity income, which she believes is undesirable as some forms of equity income are inappropriately excluded. Yet, given a very clear understanding of the equity method of accounting, it should be obvious that equity income should never be included in a profit shifting study.

DII *does include* equity income and there are several reasons that using this alternative data series does not alleviate the measurement issues we raise. As shown in Figure 1 Panel C, using DII leads to the incorrect inference that $325 of net income was earned in the Netherlands. Moreover, one would conclude that there was no income in Germany. Furthermore, pre-tax profits are unobservable (one only observes $325 in after-tax profits), and the distribution of income across countries for U.S. MNEs is skewed towards countries with relatively more equity income – i.e., tax havens (see Borga and Mataloni, 2001 and Figure 4).

4.1.2. Foreign effective tax rates

With respect to measuring tax incentives, we again refer to the example in Figure 1. Only the NI data series on the activities of MNEs contains information about tax expense, and therefore

can be used to estimate effective tax rates. Clausing argues that effective tax rates of foreign affiliates are a better measure of tax incentives than the statutory rate. Our objective is not to enter the debate on the merits of effective tax rates versus statutory tax rates, but to describe how the equity method of accounting affects the estimation of effective tax rates.

The appropriate foreign effective tax rates are 25 percent and 30 percent in the Netherlands and Germany, respectively. However, dividing tax expense by pre-tax income will not yield an appropriate tax rate measure when MNEs have indirectly-owned foreign affiliates. Equity income is an accounting construct and is not income earned in the (foreign affiliate) parent's jurisdiction. Unless it is removed from the denominator, effective tax rates will be systematically too low for countries with significant equity income. In the example in the figure, the effective tax rate in the Netherlands would be calculated as 15/340 = 4.4 percent when the appropriate tax rate should be 15/60 = 25 percent.

Given the difficulties described with income measures that include equity income, the equity method of accounting has two effects that will bias in favor of finding evidence of BEPS – overstated profits in tax havens and understated effective tax rates. This in turn implies that any regression of uncorrected BEA measures of income on incorrect effective tax rates will result in an upward bias in the estimated semi-elasticity.

4.1.3. Replication and revision of estimate of U.S. fiscal effects

4.1.3.1. Estimating the semi-elasticity of reported income to tax rates

The primary approach to the empirical estimation of BEPS in the academic literature is directly derived from the early pioneering research on MNE profit shifting, notably Hines and Rice (1994) and Grubert and Mutti (1991). The basic premise is that the observed pretax income of an affiliate represents the sum of "true" income and "shifted" income. True income is generated by

the affiliate using capital and labor inputs. Thus, measures of the capital and labor inputs used by the affiliate are included in the analysis, to predict the counterfactual "true" level of income. Shifted income is determined by the tax incentive to move income in or out of the affiliate. In the simplest scenario, this incentive would be the tax rate difference between the parent and the foreign affiliate.[19] Income reported by a low-tax affiliate that cannot be accounted for by the affiliate's own labor and capital inputs is attributed to income shifting.

Clausing (2016) uses reported country-level aggregates by the BEA to estimate the tax sensitivity of income from 1983 through 2012. In Table 1 Panel A, we replicate the regression analyses of foreign affiliate profits on foreign affiliate effective tax rates, controlling for affiliate and country level variables. We use the same set of control variables and determine our semi-elasticity as the average across the eight specifications shown in the table. We obtain an average semi-elasticity of -2.72 (in contrast to Clausing's -2.92) when the dependent variable is pre-tax NI or PTI (i.e., NI plus tax expense), which she refers to in her study as 'gross income'. Table 1 Panel B, replicates the analysis again, but uses DII as the dependent variable. Clausing performs this exercise to make the point that the data series provide consistent results. Across the eight specifications, we obtain an average semi-elasticity of -2.81, which is substantially similar to that obtained when using PTI as the dependent variable.

In Table 1 Panel C, we estimate the semi-elasticity with adjusted pre-tax income (Adj. PTI) as the dependent variable. In particular, our measure is calculated as PTI *excluding equity income*. Adjusting PTI for equity income also changes our estimate of the effective tax rate measure that we use as an independent variable. When we used Adj. PTI, we obtain an average semi-elasticity across the eight specifications of -1.80, which is nearly one-third lower than Clausing's estimate.

[19] However, more complex versions take account of the overall pattern of tax rates faced by all the affiliates of the MNC (e.g. Huizinga and Laeven, 2008).

4.1.3.2. Estimating shifted profits

Armed with a semi-elasticity estimate of profit shifting responses at the margin, Clausing next determines the amount of income that would have been reported in each foreign jurisdiction if the tax rate was the same as the U.S. tax rate. She assumes a U.S. effective tax rate of 30 percent. We summarize these calculations in Table 2 Panel A.

The amount of PTI reported in each location in the raw BEA data appears in column 1.[20] The estimate of PTI without shifting in column 2 is calculated as the total amount of PTI reported minus the product of the PTI reported, the tax rate differential, and the semi-elasticity. For example, our estimate of income without shifting for the Netherlands of $34 is calculated as $169–[$169*(30%-2.7%)*2.92]. The 2.92 is her semi-elasticity estimate and 2.7% is the estimated effective tax rate in the Netherlands. The third column shows the share of shifted income that is reported in each country, as in Clausing (2016). For example, excess profits in the Netherlands are $169-$34, or $135. Total excess profits abroad are ($815+265)-($201+$253) = $626, so 21.6 percent of 'excess' income is attributed to the Netherlands.

4.1.3.3. Estimating U.S. fiscal effects

The amount of artificially shifted profits of $626 billion from Table 2 Panel A is a key input for estimating the revenue lost due to income shifting. This number is an estimate of the total excess profits abroad, or the total change in the foreign tax base attributable to profit shifting. The steps that Clausing (2016) uses to convert this total amount of shifted profits into an overall estimate of the U.S. fiscal effects are summarized in Table 2 Panel B. Recognizing that not all of the shifted profits came from the U.S. tax base, her first step is to determine the amount of this total foreign tax base change that should put back into the U.S. Using the proportion of affiliated

[20] Our data are very close, but not identical, to Clausing (2016) because she used preliminary data from the BEA website in the past whereas we are using revised data currently posted on the BEA website.

transactions occurring with the U.S. parent as a proxy for this unobserved share, the total change in the foreign tax base is multiplied by the ratio of foreign affiliate sales to parent firms in the U.S. (reported by the BEA in 2012 as $472,687) relative to foreign affiliate sales to both parents and affiliated firms in other countries (reported by the BEA in 2012 as $472,687 + $917,445 = $1,390,132).[21] Thus, $626 * 34% = $213 is an increase to the U.S. tax base.

The second step is to consider the income shifting behavior of foreign controlled MNEs operating in the U.S. While the data do not allow for a separate estimate of foreign MNEs' profit shifting behavior, she again assumes that a reasonable proxy exists. She presumes that income shifting would increase by a factor that is based on the ratio of the sales of affiliates of foreign-controlled MNEs in the U.S. (a proxy for the ability of foreign MNEs to shift income away from the U.S. and reported by the BEA in 2012 as $4,191,727) to the sales of affiliates of U.S.-controlled MNEs abroad (a proxy for the ability of U.S. MNEs to shift income away from the U.S. and reported by the BEA in 2012 as $6,977,495). We obtain a ratio of 60 percent.[22] Thus, a total of $213+$213*60% =$341 is assumed missing from the U.S. tax base due to global profit shifting.

The third and final step is to apply the U.S. effective tax rate of 30 percent to the amount of the U.S. tax base lost to profit shifting of $341 billion. This gives us a U.S. revenue loss of $102 billion in our replication.

4.1.3.4. Sensitivity of estimates after adjusting for equity income

What do these estimates of U.S. revenue losses look like when foreign affiliate profits are not double counted? We illustrate this in Table 2 Panel C by showing each estimate as we correct the BEA data for each problem created by equity income. Column 1, which uses (unadjusted) PTI,

[21] Our ratio is 34 percent rather than the 39 percent used in Clausing (2016) again because of differences in preliminary versus revised data. We confirmed with Clausing and that the difference is due to the use of preliminary BEA data.
[22] Our 60% is very close to the 58.5% in Clausing (2016) which was generated from preliminary data.

is our starting point and is our replication from Panel B. This is the methodology underlying the upper bound estimate of the U.S. fiscal effects reported in Clausing (2009,2011,2016) that double counts foreign affiliate profits. Following Clausing's (2016) methodology, we estimate that 42 percent of U.S. corporate tax revenue was lost to profit shifting.

Next, we offer revised estimates of revenue losses using Adj. PTI in the final four columns of Table 2, Panel C. As equity income affects multiple facets of the estimated of revenue losses, we change one input at a time in our revised calculations. In column 2, we estimate shifted profits (using the methodology described above) using Adj. PTI as our measure of foreign affiliate profits, but effective tax rates and semi-elasticities derived from using (unadjusted) PTI (as in Clausing). Comparing the estimate in column 1 to the estimate in column 2 provides a sense for how much double counting matters in the BEA data and thus how overstated are the upper bound estimates offered by Clausing.

In column 3, when we adjust the income measure and our estimate of effective tax rates (but use the overstated semi-elasticity estimate), the revenue loss is reduced further to around 7 percent. In column 4, when we adjust the income measure and the semi-elasticity estimate (but not the effective tax rates), the revenue loss is around 9 percent. Thus, the measurement error in the foreign effective tax rates appears to have a larger effect than the semi-elasticity estimate. As an aside, the profit shifting literature argues that various data sources and/or methodologies will understate or overstate elasticity estimates, but we find that the elasticity estimates has less influence on Clausing's estimates of fiscal effects than the failure to consider how equity income affects the level of reported income and the measurement of the effective tax rate. Finally, in the last column, when we adjust the income measure, the effective tax rates, and the semi-elasticity, the revenue loss is around 4 percent. Thus, we believe that a more realistic estimate of the U.S.

revenue loss is somewhere between 4 and 15 percent. Our range is more in line with the OECD estimates in the Action 11 report discussed Sections 1 and 2.

4.2. Incorrect inferences using the 'Balance of Payments' data (DII)

As discussed below, several influential papers use DII from the BEA to make inferences about the profit shifting activities of U.S. MNEs. Each uses a different methodology but all aim to infer BEPS activity from DII. Before we describe these studies in more detail, we describe another example to illustrate how equity income affects DII data.

Figure 5 offers a picture of three variants of a basic ownership structure. Notice that in each structure the U.S. parent has the same economic ownership of the two foreign affiliates (i.e., 100% ownership). In Structure 1, each affiliate is directly owned by the U.S. parent. In Structure 2, the Dutch affiliate holds a partial equity interest in the German affiliate with the U.S. parent owning the rest. In Structure 3, the Dutch affiliate holds all of the equity interest in the Germany affiliate. Structure 3 is the classic example of tiered ownership from Figure 1 and there are many reasons why firms evolve to look this way as opposed to the flat structure illustrated by Structure 1.

Notice that regardless of the ownership structure, $45 of net income is earned in the Netherlands and $280 is earned in Germany. However, greater indirect ownership of the German affiliate by the U.S. parent will result in greater amounts of DII being attributed to the Netherlands. In Structure 1 (no indirect ownership of Germany) the direct investment series will report income in a manner consistent with where it is earned: $45 in the Netherlands and $280 in Germany. Whereas in Structure 3 (100% direct ownership of Germany) will result in the direct investment series reporting the entire $325 in the Netherlands.

Figure 5 illustrates that greater indirect ownership results in greater equity income as a proportion of net income for the foreign affiliate acting as the foreign parent company (the

Netherlands in this example). For example, in Structures 1, 2, and 3, we show that 0, 70 and 100 percent of DII, respectively, is earned in Germany but reported in the Netherlands. The reported location of the DII will vary depending upon the ownership structure used by U.S. MNEs. The misunderstanding of the equity income treatment in the DII leads researchers to make some incorrect interpretations of their findings. We highlight three examples below, all using different methodologies to determine the U.S. fiscal effects of BEPS but misinterpreting equity income the same way.

4.2.1. Zucman (2014,2015)

In Zucman (2014) and the very influential book, Zucman (2015), the author estimates that artificial profit shifting to tax havens enables U.S. companies to reduce their tax liabilities by $130b per year. This appears to be a 'back-of-the-envelope' estimate for 2013 using three inputs: (i) an approximation of total pre-tax foreign profits of $650 billion, (ii) an approximation that 55 percent of those profits "come from" six tax havens using DII, and (ii) an approximation that those profits were taxed in those tax havens at a very low (or no) tax rate. Thus, $650b*55%*35% = approximately $130b of Zucman's estimated 2013 revenue loss. However, in Figure 4 we show that his share of foreign affiliate profits in those six tax havens is overstated and should be 35 percent. Simply changing this part of his calculation lowers his estimate from $130b to approximately $80b.

4.2.2. Clausing (2009,2011,2016,2019)

In each of her papers, Clausing has acknowledged that aggregate net income from the 'Activities of MNEs data' described above results in 'some form of' double counting. This leads Clausing to rely on DII from the BoP data, which she mistakenly believes does not include equity income: "This data series excludes all income from equity investments" (Clausing, 2016, p 911).

However, as we've discussed, DII misreports the location of MNEs' foreign earnings. In addition, Clausing's work adjusts DII in a manner that results in an overstatement of foreign profits.

Recall that the DII series only records activity related to the parent's direct ownership in affiliates. For example in Structure 2 of Figure 5, if the U.S. parent only owned 30 percent of the German affiliate with $280 of net income, the DII series would only include $84. Therefore, Clausing (2009,2011,2016,2019) is concerned that the estimate of the revenue loss will miss part of the profits shifted to Germany. For example, if $1 was shifted from the U.S. to Germany, only $0.30 will be observed in the DII data. Hence, to ensure that the full $1 is included in the revenue loss estimate, Clausing would like to gross up the partial share of the German affiliate's net income captured in DII by its level of direct ownership (i.e., 30%).

The 30 percent is not reported in any of the aggregate data series. But Clausing annually contacts BEA staff to get the average direct ownership percent of all U.S. MNEs' foreign affiliates.[23] This percentage is then used to gross-up aggregate DII. In the case of Structure 2, BEA staff would provide Clausing with an estimate of direct ownership of 65 percent ((100+30)/2). Since she is provided with only a single percentage and cannot observe which countries have direct versus indirect ownership, Clausing will gross up the aggregate DII from all countries by 65 percent to infer that aggregate net income of this MNE is $500 ($371 in the Netherlands and $129 in Germany).

In the case of Structure 3, the average direct ownership is 50 percent ((100+0)/2). In this case, she would infer that aggregate net income of this MNE is $650 ($90 in the Netherlands and $560 in Germany). In Structure 1, where there is no indirect ownership, the average direct ownership is 100 percent so there would be no gross-up and she would use DII of $325 ($45 in the

[23] This percentage from 2004 through 2015 is as follows (and is decreasing over time as ownership structures become more tiered): 65.6, 65.3, 65.0, 65.0, 64.0, 58.1, 58.2, 57.8, 57.2, 56.5, 53.4, and 56.6.

Netherlands and $280 in Germany). The greater the number of indirectly-owned affiliates, the lower the average direct ownership percentage. Since U.S. MNEs have been growing in complexity, the gross-up methodology will lead to too much income being attributed to foreign jurisdictions.[24]

Overall, there are at least three issues with the gross-up. First, since the DII series doesn't provide any information about whether affiliates that are less than 100 percent directly owned are owned indirectly by the MNE's domestic parent, grossing up will typically lead to an overstatement of income in the data series.[25] To illustrate our concerns, we refer to Structure 2 in Figure 5. For Structure 2, a researcher observes that there is $241 of income related to the direct ownership of the Netherlands affiliate and $84 of income related to the 30% direct ownership of the Dutch affiliate. The existence of the 70% ownership of the German affiliate (denoted by the dashed line) by the Dutch affiliate is unobservable. Additionally, in Structure 3, the existence of the 100% ownership of the Germany affiliate by the Dutch affiliate is also unobservable. Second, it is also quite possible that the missing direct ownership could be due to the ownership of the affiliate by *another* U.S. MNE. If this is the case, then the statistics will be as biased as if the foreign affiliate has indirect ownership. Third, to do this gross-up correctly, Clausing should be provided with the average direct ownership of only directly owned affiliates (which is approximately 95 percent in 2012).

Ultimately, this gross-up procedure effectively reintroduces the double-counting problem that the use of the DII series was intended to solve. In Table 3, we report our replication of

[24] The important gross-up procedure can be inferred from only one sentence on pg. 918 in Clausing (2016): "data from the BEA are adjusted to include foreign taxes paid and to reverse the BEA's adjustment of the data by the U.S. parent equity ownership percentage." However, as we've shown using our examples in Figure 5, her gross-up more than reverses the BEA adjustment because the average direct ownership gross-up percentage is always too low.

[25] Note that this gross-up procedure has other issues such as it is applied to every country. Since the proportion of income in tax havens is already disproportionate in this data series (because they are more often at the top of the ownership chains), the gross-up calculation simply exacerbates this issue.

Clausing's (2016) fiscal estimate using DII grossed-up by average direct ownership of all foreign affiliates of 57 percent. Following the exact same procedure as described for Table 2 Panel C, in Column 1 we estimate a revenue loss of $76 billion, as compared to Clausing's (2016) $77 billion. In Column 2, we offer an estimate based on DII that has not been adjusted for indirect ownership. The Clausing (2016) estimate of the fiscal effects using direct investment income is only 70 percent ($77/$111 billion) of her estimate using net income, while ours is 42 percent ($43/$102 billion).[26] This implies that the alternate estimate she offers is extremely sensitive to the gross-up procedure.[27] In summary, it is that it is unclear why using DII is a sensible solution to the double counting problems that arises from using PTI. Instead, one should simply subtract equity income from PTI provided in the data series on the activities of MNEs. Using direct investment income provides a lower estimate of profit shifting only because aggregate foreign profits are lower, but it is still not an appropriate way to measure profit shifting because the distribution of reported profits is somewhat arbitrary depending on the organizational structure of MNEs' foreign affiliates.

4.2.3. Guvenen, Mataloni, Rassier and Ruhl. (2019)

Concerned with national statistics that are showing a significant slowdown in U.S. productivity, Guvenen et al. (2019) suggest that measures of U.S. productivity are downward biased due to U.S. MNCs' tax-related profit shifting. Their basic premise is that much of the profits of MNEs reported in tax havens have been artificially shifted out of the U.S. and should be moved back into the U.S.-reported national statistics. Arguing that tax planning increased significantly since 1999, the paper uses apportionment to reallocate aggregate DII based on the location of MNEs' payroll and assets. Ultimately, the paper concludes that in some industries, up to 8% of the

[26] For our DII estimate of revenue lost, we use the same semi-elasticity and tax rate that Clausing calculated using PTI that includes equity income.
[27] Note that other researchers that rely on the DII data series – including authors within the BEA – do not gross-up the DII data to account for less than 100% ownership of direct foreign affiliates.

industries' value-added activity has been shifted out of the U.S. This 8% represents an increase in the annual growth of productivity of 0.53% from 2000 to 2008.

While we accept the authors apportionment exercise at face, we challenge the authors' interpretation of their results as stemming from tax-related profit shifting. To illustrate our concern, we again turn to our example in Figure 5. Suppose that there is $325 of net income in the U.S. parent (there is no equity income in the $325) and that the payroll and PPE in each of the three countries suggest that 70% of worldwide income should be in the U.S., 25% should be in Germany and 5% should be in the Netherlands. The aggregate worldwide income of this MNE is $650 ($325 US + $280 Germany + $45 Netherlands). With these apportionment factors, Guvenen et al (2019) would report that $455 of worldwide income should be apportioned to the U.S., $162.50 should be apportioned to Germany and the remaining $32.50 should be in the Netherlands. Given the net income earned in each of the jurisdictions (i.e., $325 US + $280 Germany + $45 Netherlands), one would expect $12.50 to be removed from the Netherlands into the U.S. ($45-32.50) and $117.50 ($280-162.50) to be removed from Germany into the U.S. The adjustments out of Germany and the Netherlands increase the U.S. tax base by $130 (12.50+117.50). Note that the $130 is also the difference between apportioned and actual income reported in the U.S. ($325-$455). If the MNE is organized as Structure 1, then these are the adjustments to the tax base, and hence productivity, for each country that would be reported in Guvenen et al (2019).

However, assuming the MNE is organized in Structure 3, Guvenen et al (2019) will report that $292.50 ($325-32.50) will be removed from Netherlands and into the U.S. The authors suggest that this represents profits that have been artificially shifted out of the U.S. But, in reality, only $45 was earned in the Netherlands, so only $12.50 of profits can be shifted out. Therefore, we argue that their results are misleading because $280 of the adjustment to the Dutch affiliate is

related to the equity income from the Netherland's indirect ownership of the Germany affiliate. As there is no DII reported in Germany, Guvenen et al (2018) would report an adjustment to increase the tax base in Germany of $162.50 (0 – $162.50). Furthermore, the net effect to the U.S. is still a $130 increase in its tax base (292.50-162.50).

If the MNE is organized in Structure 2, Guvenen et al (2019) will report that $208.50 will be removed from Netherlands ($241-32.50) and into the U.S. But $78.50 of this negative adjustment represents net income that should be reported in Germany ($84-162.50) with a net increase to the U.S. base of $130. Notice that the greater the equity ownership, the greater the net income shifted out of the directly owned affiliate.

Overall, each of these sets of adjustments (which depend upon the ownership structure) result in the correct amount of DII being reallocated to the appropriate jurisdiction. However, the paper's inference that each of these sets of adjustments are economically equivalent is wrong. And, we conjecture that the reason for the paper's reported uptick in reallocated profits over time is likely related to increasing complexity in ownership structures with their accompanying increase in equity income rather than staggering increases in profit shifting.

Unfortunately, Guvenen et al (2019) do not provide details about the extent of the positive adjustments. Rather, they aggregate up all of the negative adjustments and imply that these amounts represent income that has been artificially shifted in the U.S. We argue that this is tremendously misleading. While we do agree that their apportionment schedule represents a reasonable approach to allocating global income, the tenor of their story is far different if income is being removed from a non-haven country like Germany. We estimate that approximately 75% of the income that Guvenen et al. (2019) call U.S. tax base lost to tax havens cannot be

characterized in this manner. Despite having access to micro-data, the authors make no attempt to determine the country in which the income was actually earned.

4.3. Comparing national accounts and international investment data across countries

Recent studies appear to be comparing national accounts and international investment (balance of payments) data at a global level to infer that profits and assets are missing or hidden (e.g., Tørsløv et al. 2019; Niels et al. 2019; Angulo and Hierro 2017).[28] This work suggests that one country's outbound activities (e.g., U.S. MNEs' income or assets in the Netherlands) should match the counter-party country's reporting of inbound MNE activity (e.g. Netherlands income or assets attributable to U.S.-owned affiliates). However, differences in accounting for the activities of indirectly-owned affiliates requires that a comparison of U.S. to non-U.S. national statistics be done with care. Unless provisions are made for differences in the accounting for the activity of indirectly-owned affiliates, these types of comparisons could yield upwardly biased estimates of missing or hidden profits/assets.

To illustrate how the bias arises, in Figure 6 we create an organizational structure of a U.S. and non-U.S. MNE to represent the universe of MNEs.[29] Notice that the U.S. and non-U.S. MNEs are identical except that we flip the jurisdictions of a directly-owned affiliate and the parent. For expositional ease, assume that each of the foreign affiliates is 100% owned by its direct parent, that each entity within the MNE earns $30 of net income and that no dividends are paid within the group.

[28] We focus our discussion on Tørsløv et al. (2019) because they are using direct investment income (FDI flows) to infer missing profits and our study is focused on how equity method accounting affects profits. However, Niels et al. (2019) and Angulo and Hierro (2017) face the same measurement issue because they use the same approach to gross-up the FDI stocks in tax haven countries by comparing reporting with counterparties. As the accounting for indirectly-owned affiliates also affects the balance sheet, the U.S. will always report higher assets in tax havens than the tax havens will report.

[29] Typically, non-U.S. MNEs have flatter organizational structures but for purposes of illustration we make them comparable. Because the U.S. affiliates of foreign MNEs were, until very recently, subject to the worldwide system of taxation, U.S. affiliates of non-U.S. MNEs had few indirectly-owned affiliates.

We show the amount of FDI flows that each jurisdiction would report in their outbound and inbound international investment data. As explained in the previous sections, the U.S. DII outbound reporting will include equity income of any indirectly-owned affiliates. No other countries will include this income in its DII data series as we assume they each require the cost method of accounting. Because of the U.S.'s use of the equity method, we hypothesize that the aggregate outbound activity will always be higher than the inbound activity reported.

Consistent with our expectations, notice that for the U.S. MNE, the table shows an imbalance in the inbound and outbound activity of $30. This extra $30 of income stems from the fact that the U.S. will report $60 related to the Netherlands outbound data but the Netherlands only reports $30 from the U.S. in its inbound statistics. Again, as equity income grows, the greater the appearance or presumption that the profits of U.S. MNEs are missing from the counterparty's national statistics. As tax haven jurisdictions tend to represent the first tier of foreign affiliates (or foreign parents) of U.S. MNEs, profits are then assumed to be shifted to these tax haven countries. Note that there is no such imbalance in the reporting of the inbound and outbound activity of the Irish MNE. This is primarily because Ireland does not require the equity method.

This inconsistency in accounting methods inhibits the types of comparisons made by Tørsløv et al (2019).[30] These authors compare aggregate global inbound and outbound FDI flows and note that there is a direct investment income surplus globally of $200 billion in 2015. This $200 billion figure is analogous to the aggregate imbalance observed across our two MNEs of $30. The authors then proceed to 'plug' this imbalance by 'correcting' the profits reported in various tax haven countries. Note that this procedure is based on the presumption that the inbound

[30] Related to this issue, foreign direct investment activity will be similarly biased. The reported outbound FDI of U.S. MNEs will be higher than the reported inbound activity by the U.S. MNEs' counter-party. This will likely affect the inferences drawn from work such as Niels et al. 2019. See Albertus (2019) for a discussion of how this issue affects the direct investment income puzzle found in the finance literature.

reporting in tax havens is too low, rather than concluding that the outbound reporting of other countries (such as the U.S.) might be too high.

The authors attribute the $200 billion imbalance to specific tax haven countries in several steps. First, they rely on bilateral international investment data, which not all countries report. These data exist when both the inbound and outbound FDI flows between two specific countries can be observed, and thus compared. If the conjecture illustrated by our simple example in Figure 6 is true, we anticipate that a significant portion of this $200 billion imbalance will be allocated to tax haven countries based on comparisons of inbound versus outbound bilateral FDI flows occurring specifically with the U.S. Consistent with our conjecture, Tørsløv et al.'s investigation reveals E.U. tax havens under-report inbound FDI income by $103 billion and they further find that "almost all of this gap owes to the large gap ($95 billion) between what these havens report paying to the U.S. and what the U.S. declares receiving from these havens-in fact, with other partners, there is almost no discrepancy (pg. A.18)".[31] Why would E.U. tax havens systematically under-report income of U.S. affiliates more so than affiliates from other partner countries? The answer is that they would not. This revelation is simply a consequence of the U.S. using the equity method of accounting to measure direct investment income (DII).

Further, they continue to allocate the remaining global FDI imbalance to countries without bilateral investment data using a series of assumptions. Again, a significant portion (57 percent) of the missing profits in other tax haven countries ends up relating to the under-reporting of U.S. foreign affiliate income in tax haven countries. It is apparent from Table B.10 of Tørsløv et al. in the column showing the corrections related to the U.S. that this exercise is flawed. The countries

[31] The authors state: "We assume that the U.S. data are correct and upgrade the data of E.U. tax havens so as to close the discrepancy with the United States (pg A.20)".

with significant underreported profits are those with the greatest levels of equity income in the net income that is used to measure U.S. outbound FDI (equity) flows – Luxembourg, Netherlands, Ireland, Bermuda, Caymans and Singapore.

Finally, the authors note that it is of little consequence how they allocate the imbalance across tax havens (pg. A.21): "Taking seriously the DI income data of EU havens instead of correcting them to match the US data would only affect the geography of where profits are shifted. Namely, we would find more profit shifting to the Caribbean and Asian havens, and less shifting to the EU havens." However, this argument is circular. The global FDI imbalance itself is a function of U.S. data. Referring back to our example in Figure 6, this is like estimating a global FDI imbalance (surplus; e.g., outbound > inbound) of $30 and then using bilateral FDI data to show that the Netherlands specifically is under-reporting the income of the U.S. affiliate by $30. Further, the authors then are arguing that even if bilateral FDI data are not entirely reliable that the $30 is being underreported somewhere and so represents profit shifting. However, if the U.S. didn't use the equity method of accounting, there would be no FDI imbalance to begin with, and thus, no unrecorded profits to 'plug' to tax havens.

The determination of a global FDI imbalance and how it subsequently gets plugged to various countries as missing profits is a critical component of Tørsløv et al's methodology of estimating revenue losses from global profit shifting. Generally speaking, every dollar of income that is determined to be 'under-reported' is believed to be a dollar of shifted profits.[32] Since the author's calculations in Table B.10 show that at least 70% of their unreported profits are attributable to the missing profits of U.S. foreign affiliates, this methodology is overestimating shifted profits and revenue losses simply because the U.S. uses the equity method of accounting

[32] The reason is that in their methodology, missing profits generally increase foreign-controlled profits and shifted profits are determined by comparing foreign-controlled profits to domestic-controlled profits.

to capture direct investment earnings whereas partner countries do not. Finally, this does not imply that the U.S. is not complying with international guidelines for reporting direct investment income; those guidelines do not address measurement issues like how to account for profits of indirectly-owned affiliates. That is purely an accounting method choice that each country makes with respect to measuring the net income of foreign affiliates.

5. Comparisons with other data sources

Profit shifting research uses three additional sources for measures of MNE's foreign activity. The U.S. Treasury publishes aggregate information on U.S. MNEs' international operations collected from tax returns. Detailed financial statements information of (predominantly) U.S. MNEs is collected and reported by Standard & Poor's' Compustat. Finally, Bureau van Dijk (BvD) collects regulatory reporting filings for a global sample of MNEs. Below, we will discuss how each of these data sources can be compared to the aggregate statistics offered by BEA's activities of MNEs data and balance of payments data.

5.1. Treasury Data from the Statistics of Income

We begin by comparing our adjusted PTI amounts to the aggregate data reported by Treasury. Treasury's Statistics of Income (SOI) publishes two data series that provide aggregate information about U.S. MNEs' foreign affiliates. The first, Form 5471, Information Return of U.S. Persons with Respect to Certain Foreign Corporations, along with its accompanying schedules is required to be filed for each foreign affiliate owned (directly, indirectly or constructively) more than 50% by U.S. shareholders.[33] Beginning in 2016, taxpayers are also required to file Form 8975,

[33] A Form 5471 is required to be filed by any U.S. person who owns 10% or more of a controlled foreign corporation or "CFC". A CFC is a foreign corporation that has U.S. shareholders that own more than 50% of the vote or value of the stock of the corporation. Notice that this definition implies that more than one shareholder may file a Form 5471 for the same CFC.

Country-by-Country Report (CbyCR). Any U.S. taxpayer with more than $850 million in revenues in the previous tax reporting period is required to complete CbyCR.

5.1.1. Form 5471

Treasury reports aggregate assets, revenues and earnings and profits (E&P) of all CFCs on Form 5471 on a biennial basis. [34] Aggregate assets and revenues are reported using accounting information that follows GAAP.[35] Reported E&P, however, is a tax concept that roughly approximates the net income generated in each foreign affiliate. The E&P schedule is intended to track aggregate profits that would be subject to incremental U.S. tax upon the repatriation under the U.S.'s worldwide tax system or subject to the U.S.'s CFC regime (referred to as Subpart F). E&P is created when dividends are paid from one affiliate to another. This reporting somewhat mimics the cost method of accounting from Figure 1. Recall that the $10 dividend paid from Germany to the Netherlands results in the $10 of dividends being effectively reported in income twice: First in the German entity, as dividends are not deductible from net income, and again in the net income of the Netherlands affiliate. Because of this concern with double counting, in 2010 the SOI began providing information about dividends received from related affiliates.

In Table 4 Panel A, we report the aggregate 2014 E&P from Form 5471 for seven haven countries along with measures we obtain from BEA aggregates. We've included the aggregate net income with and without the related dividends. Notice that aggregate foreign pre-tax E&P without related dividends is roughly $70 billion higher than the adjusted BEA income. This could be attributable to more foreign activity being reported to the IRS or because of duplicated Form 5471

[34] SOI data is only published in aggregate biennially in even years. The most recent year of the data is 2014.
[35] Form 5471 includes Schedule C, Income Statement, and Schedule F, Balance Sheet. However, except for total revenue and total assets, these data are not aggregated and reported by SOI. The instructions from these schedules state that taxpayers should report all amounts "in accordance with U.S. GAAP." There is no guidance in the instructions regarding how to account for the activity of indirectly-owned foreign affiliates.

filings (see footnote 33). But what is striking is that the SOI data reports substantially more activity in havens than the adjusted BEA amounts. This over-reporting of income in tax havens is likely related to a known problem with disregarded entities created via the check-the-box regulations.[36]

For tax planning purposes, many companies establish disregarded entities. This means that certain legal entities may not be reported in the right jurisdiction in the Treasury data if the entity has elected to be disregarded. If an entity is disregarded, then its activity will be aggregated with the activity of another legal entity, which is almost certainly in a different country. Effectively, this means that although the aggregate level of income may be reported correctly, the location of that income is potentially incorrect. Dowd, Landefeld and Moore, (2017) explain that there is no way for researchers using the Treasury data to ascertain how much income from disregarded entities exists and the countries to which it belongs. In contrast, the BEA data requires firms to report income based on where the income is generated even if the entity is disregarded for income tax purposes. Hence, the reported locations of adjusted BEA income measure should not be confounded by disregarded entities, as is Treasury data.

An additional problem arises when researchers attempt to use the income statement (Schedule C) from Form 5471. Although Form 5471 includes a detailed schedule on E&P (Schedule H) and the taxes paid on current E&P (Schedule E), these schedules do not provide any details on the revenue and expense (except for taxes) components of E&P. This leads researchers to rely on Schedule C, which, as explained in Section 3.1, must include activity for directly- and indirectly-owned affiliates. However, as there is no description for how to account for this activity

[36] See Blouin and Krull (2018) for a detailed discussion of tax planning utilizing check-the-box.

in the instructions of the form, we suspect that MNEs could report the activity of its indirectly-owned affiliates in any of the three manners described in Figure 1.[37]

Note that due to accounting issues with Form 5471, relying on either the income statement or current E&P potentially bias the semi-elasticity of foreign profits with respect to effective tax rates found in papers such as Dowd, Landefeld and Moore (2017) and could provide an inaccurate picture of the underlying source country from which foreign affiliate dividends actually originate.

5.1.2. CbyCR – Form 8975

CbyCR stems from the OECD's BEPS Action Item 13. By requiring similar reporting of economic activity for all MNEs across all jurisdictions, Action 13 intends to provide governments with information to help combat aggressive profit shifting activity. CbyCR requires large MNEs to report revenues, profits, income taxes, capital, accumulated earnings, employees and tangible assets by jurisdiction. Again, the data is based on financial reporting information not tax reporting. Unlike the U.S.'s Form 5471, CbyCR reporting guidance requires data to be collected in a manner Additionally, U.S. CbyCR filing instructions stipulate that filing is required by any entity "with a single owner that may be disregarded as an entity separate from its owner." As such, the location of income in these data is not confounded by disregarded entities as in Form 5471.

However, the CbyCR does have some limitations. First, CbyCR is a new disclosure requirement and the IRS is continuing to release clarifications and updated form instructions for taxpayers wishing to comply with the new reporting requirements. To date, we only have one year of CbyCR. Second, although the U.S. requires CbyCR reporting to be based on MNEs' audited

[37] We suspect that taxpayers may be able to remove the activity related to indirectly owned affiliates from book income as the E&P schedule allows the taxpayer to make "Other" net additions or subtractions to book income to reconcile book income to current E&P. Unfortunately, SOI does not publish aggregate net income from the income statement. If they did, we could observe whether net income from Schedule C is substantially higher than current E&P from Schedule H. However, we are able to observe that total assets reported on the balance sheet (Schedule F of Form 5471) is higher than adjusted total assets found in the BEA data.

financial statements, other countries allow the reporting of the information based using audited financial statements, statutory reporting, or even regulatory reporting. An MNE is simply required to use the same reporting conventions year over year. But this limits the ability of researchers to use to the data to estimate profit shifting activity across firms and countries.

Third, the U.S. CbyCR does double count income that is classified as stateless. Anecdotally, many researchers believe that stateless income only includes activity that effectively avoids tax in all jurisdictions. However, this category primarily includes the income of conduit entities that are not subject to tax. Conduits include partnerships, which themselves are not subject to tax. Rather, their owners, the partners, are subject to tax based on their proportional ownership in the entity. CbyCR requires that large partnerships report their activity that is passed through to their owners on Form 8975 as stateless. If the partner also has a duty to file CbyCR, then it will report its proportional shares of the partnership's income on its CbyCR based on where the partner is subject to tax.[38] Notice that any income included in the partner's CbyCR reporting is double counted.

Table 4 Panel B provides a comparison of CbyCR to the other BEA income measures. Interestingly, the CbyCR data is more similar to our adjusted PTI measure both in terms of aggregate income and the proportion of aggregate income earned in tax havens. Both DII and PTI significantly overstate the amount of income earned in tax havens. It would be interesting to compare data from Form 5471 to CbyCR reporting. However, given that SOI typically publishes aggregate Form 5471 data roughly two years after the final return filing deadline for calendar year firms (e.g., 2014 data was published in September of 2017), it appears that SOI may have stopped reporting this data series as the 2016 data should have been published in September of 2019.

[38] See the instructions of Form 8975 for an example of how stateless income is reported by conduit entities.

However, it is striking to see the difference between the 5471 and CbyCR across the periods (2014 in Panel A versus 2016 in Panel B). Using the CbyCR as a benchmark, it clearly appears that Form 5471 data is recording income in incorrect jurisdictions.

5.2. Financial Reporting

Another source of data about MNEs' foreign operations is their publicly available financial statements. U.S. GAAP requires companies to report pretax income attributable to the U.S. and to its foreign activity. In addition, firms must report U.S. and foreign tax expense. Although firms disclose the locations of their material subsidiaries, the financial statements do not provide any detailed financial information about activity in MNEs' foreign affiliates.[39] However, we can compare aggregate foreign pre-tax income and tax expense to BEA measures of income and taxes. Because public companies likely represent the majority of the U.S. outbound investment activity, aggregate financial statement information can provide a baseline to compare the reasonableness of our various BEA measures of economic activity.

Because financial statements represent the consolidated activity of the MNE, pre-tax foreign income (and related tax expense) will not be subject to double counting described above. In Table 5, we compare aggregate foreign pre-tax income and foreign tax expense collected from publicly available financial statements to the measures from the BEA and Form 5471. Notice that the financial statement income and taxes are very similar to the BEA reported amounts. We anticipated that the aggregate financial statement activity will be slightly less that the BEA data because large private firms without public debt will be reported in the BEA but not in the financial statements. However, it appears that the BEAs reporting thresholds result in some MNEs not

[39] Note that segment information is also required by U.S. GAAP. However, firms that report geographic segment information may aggregate across regions or continents. Firms have significant discretion in the choice of segments to report.

reporting in the BEA data because aggregate financial statement income is higher than amounts reported in the BEA data. Although total taxes reported on Form 5471 is reasonably close to the amounts reported in financial statement and by the BEA, the current E&P activity exceeds both amounts, suggesting that the Form 5471 is double counting some foreign profits.

5.3. Bureau Van Dijk

Unlike U.S. financial reporting information, Bureau Van Dijk (BvD) collects data on non-U.S. MNEs. BvD collects data from over 160 information providers covering over 200 countries and territories. Of the roughly 300 million companies covered by the BvD data, over 99% of them are private firms. The data includes financial information for both consolidated organizations as well as for the separate affiliates of consolidated organizations. Many researchers use BvD to study profit shifting (e.g., Huzinga and Laeven 2008; De Simone 2016; Markle 2015; Dischinger and Riedel 2011).

While BvD documentation reports that financial information for consolidated MNEs is collected from annual reports, the documentation is less clear about the sources of the separate company financial information. Because separate company filings will require accounting to deal with the activity of indirectly-owned affiliates, there could be variation in practice across the BvD data. If countries have different reporting requirements for income from investments in affiliates, then work that compares the profit shifting across different countries will potentially be biased.

A preliminary review of U.K. statutory reporting (the source of BvD UK separate company reporting) suggests that the U.K. affiliates report income from foreign affiliates based on the cost method of accounting. However, it appears that statutory reporting in Germany allows firms to report either on the cost of equity method. As income from lower-tiered affiliates is at least

partially duplicated in the BvD data, MNEs with more sophisticated ownership structures are going to appear to have more income in upper tiered affiliates relative to lower tiered affiliates.

6. Conclusions

To date, the BEA net income series from the financial and operating data represents the best available data source to measure the BEPS activity of U.S. MNEs. However, in order to generate unbiased estimates of BEPS, the data must be adjusted for the earnings in lower tier affiliates called equity income. As more researchers gain access to the BEA data, we hope that this paper serves as a roadmap to help them become aware of the double counting issue and how to correct their data.

We document that the accounting issues in the BEA data result in a non-trivial difference in the U.S. revenue loss from BEPS. We conclude that many of the existing estimates in the academic literature are significantly overstated and, therefore, one should interpret with caution any conclusions about BEPS countermeasure when researchers are using the BEA data unadjusted for equity income. Specifically, we when adjust the BEA income measures for equity income, we document estimates of revenue losses that only a third of previous estimates found in the literature.

The issues pointed on in this paper are also salient in other data series. In particular, we hope that researchers will include some discussion of the double counting issues when using data such as Bureau Van Dijk's Orbis or Bundesbank's MiDi. The Statistic of Income's 5471 data series also appears to suffer from some double counting and misallocation of income across jurisdictions. However, the initial CbyCR seems to rectify some of the limitations of the 5471s.

Finally, we highlight that the U.S.'s national statistics cannot be compared to those of other countries' to infer hidden or missing profits. Because of differences in accounting for indirectly-

owned foreign affiliates, such comparisons cannot provide any meaningful inferences about profits stashed in tax havens.

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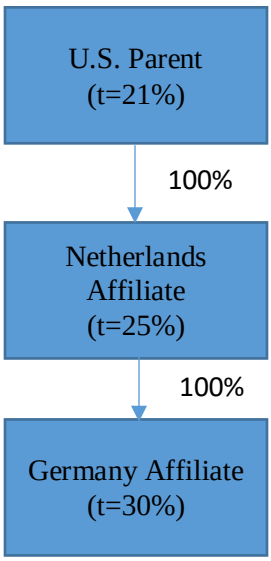
Figure 1
Accounting for activity of an indirectly-owned foreign affiliate

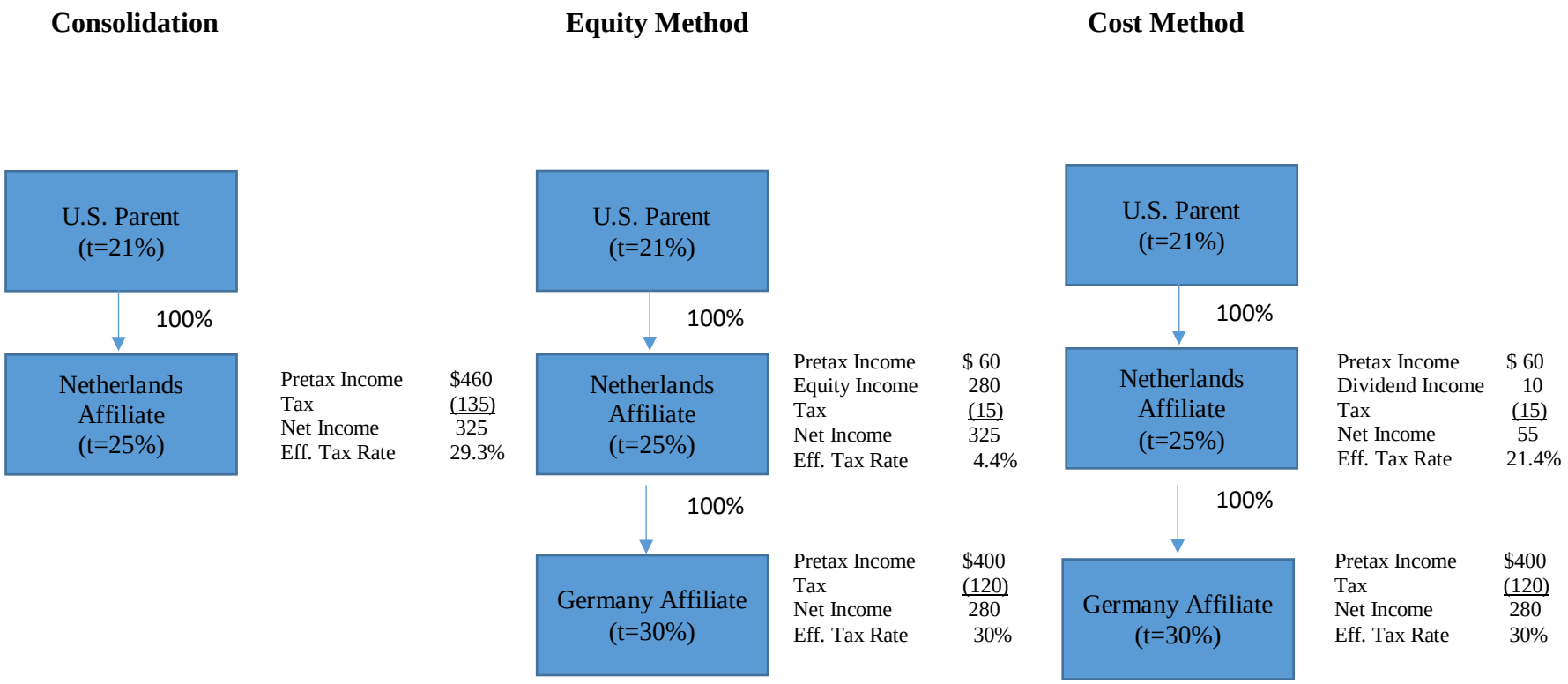
PANEL A: Organization and Activity



Pretax Income	$60
Tax	(15)
Net Income	45

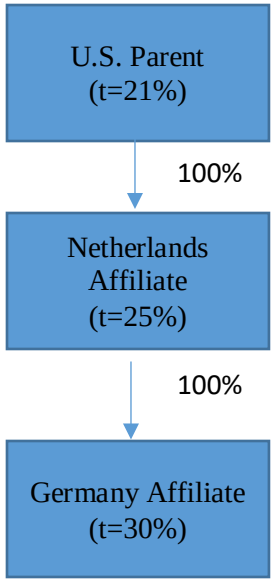
Pretax Income	$400
Tax	(120)
Net Income	280

PANEL B: Accounting Methods



Panel C: BEA measures of Income

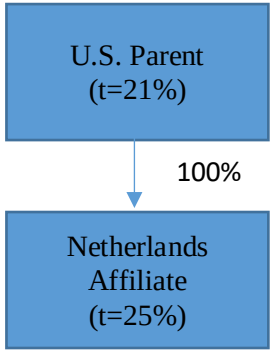
Net Income



Pretax Income	*$ 60*
Equity Income	*280*
Tax	*(15)*
Net Income	*325*
Eff. Tax Rate	4.4%

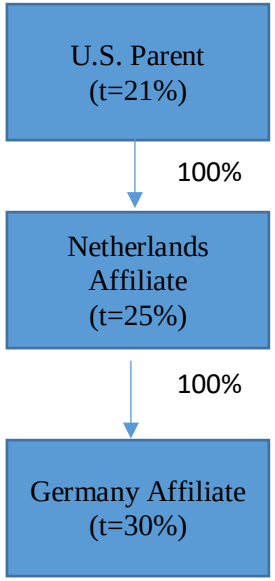
Pretax Income	*$400*
Tax	*(120)*
Net Income	*280*
Eff. Tax Rate	30%

Direct Investment Income



Pretax Income	$ 60
Equity Income	280
Tax	(15)
Net Income	*325*
Eff. Tax Rate	4.4%

Adjusted Net Income

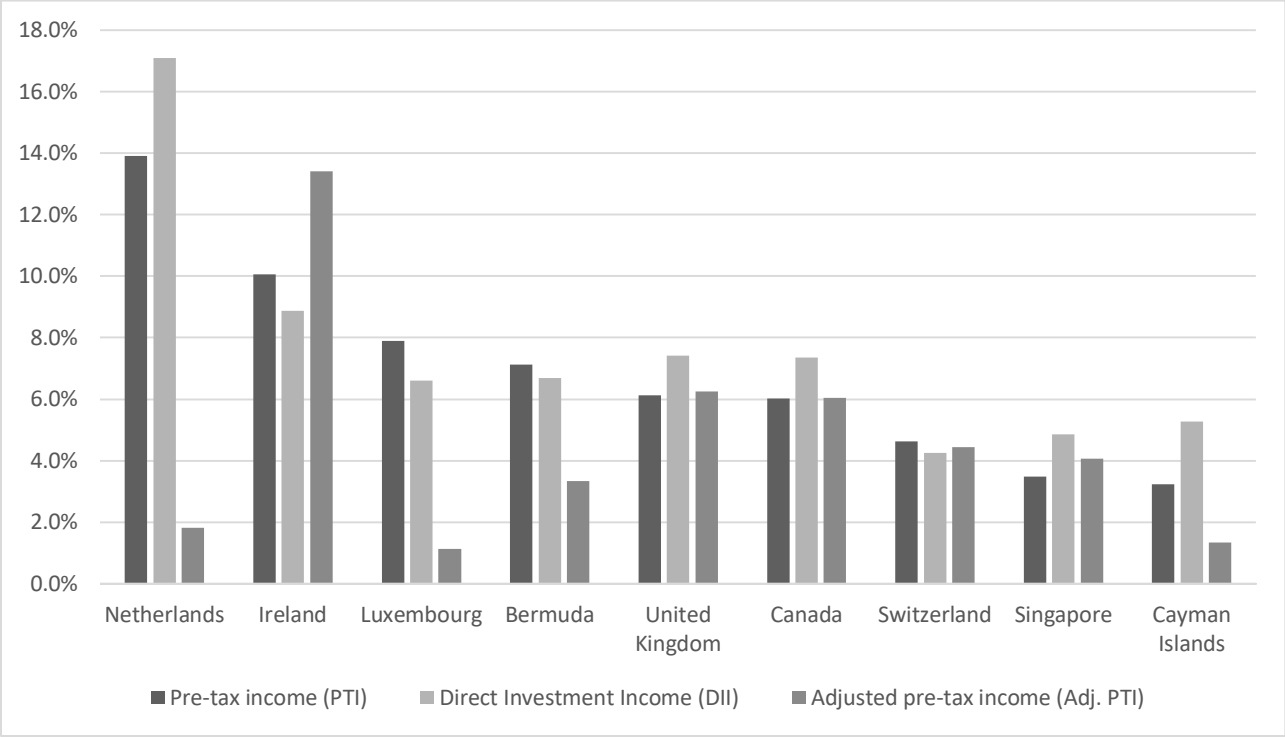


Pretax Income	*$ 60*
Equity Income	*-*
Tax	*(15)*
Net Income	*45*
Eff. Tax Rate	25%

Pretax Income	*$400*
Tax	*(120)*
Net Income	*280*
Eff. Tax Rate	30%

Only the items/amounts in italics are observable in the BEA data.

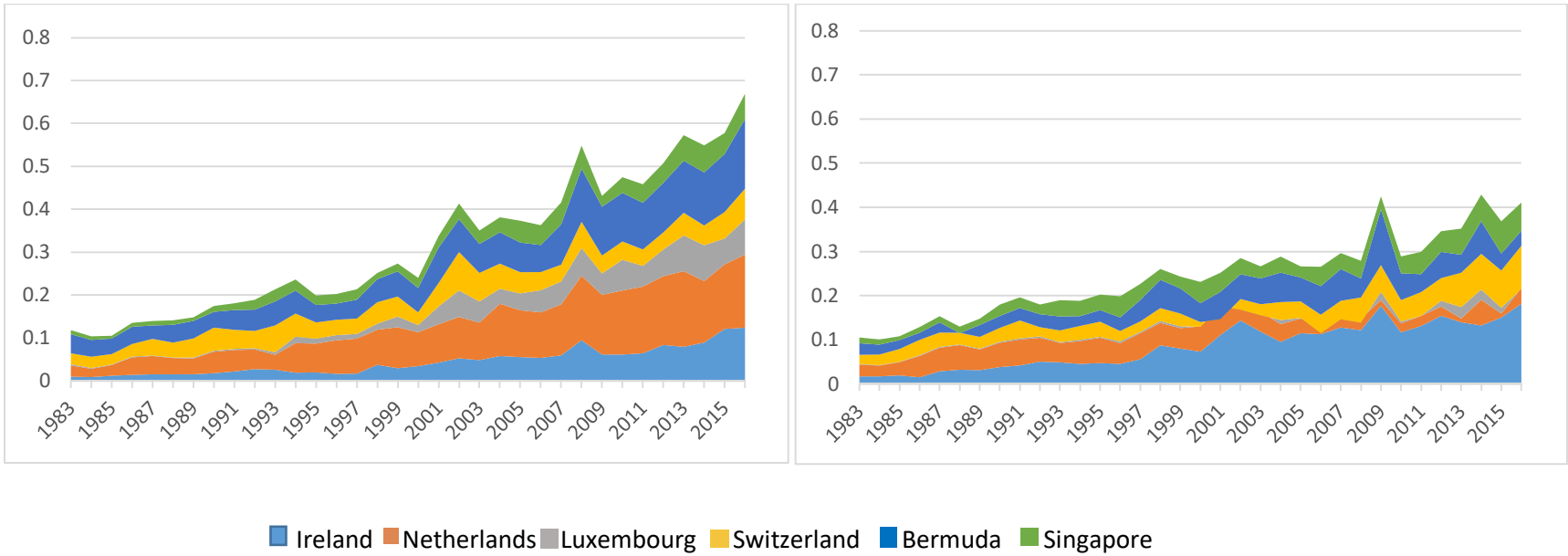
Figure 2
Comparison of BEA Measures of Income, 2012



Note: This figure replicates Figure 1 from Clausing (2016). Clausing (2016) uses *PTI* and *DII*; we add our measure, *Adj.PTI*, to the figure. *PTI* is aggregate Net Income plus foreign tax expense as reported in the Activities of U.S. MNEs data. *DII* is aggregate parents' shares of the net income of directly-owned affiliates as reported in the Balance of Payments data. *Adj.PTI* is aggregate PTI less equity income.

Figure 3
Comparison of Zucman (2014, 2015)'s Corporate Profits Reported in Tax Havens

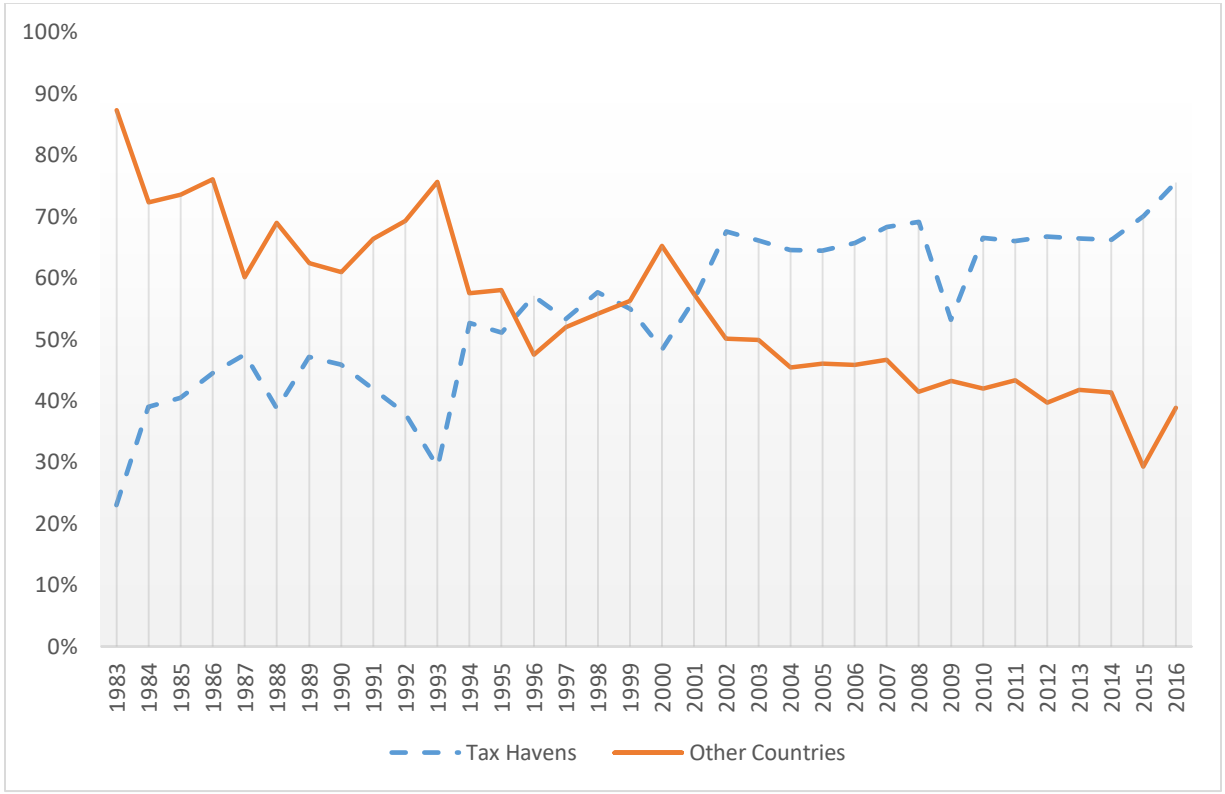
Direct Investment Income (DII) as Reported by Zucman **Using Adjusted Pre-tax Income (Adj. PTI)**



Note: This figure replicates Figure 2 from Zucman (2014) (it is also slide 20 from his long presentation on the Hidden Wealth of Nation: The Scourge of Tax Havens and on page 106 of Zucman (2015)).

DII is aggregate parents' shares of the net income of directly-owned affiliates as reported in the Balance of Payments data. *Adj. PTI* is aggregate Net Income plus tax expense less equity income as reported in the Activities of U.S. MNEs data.

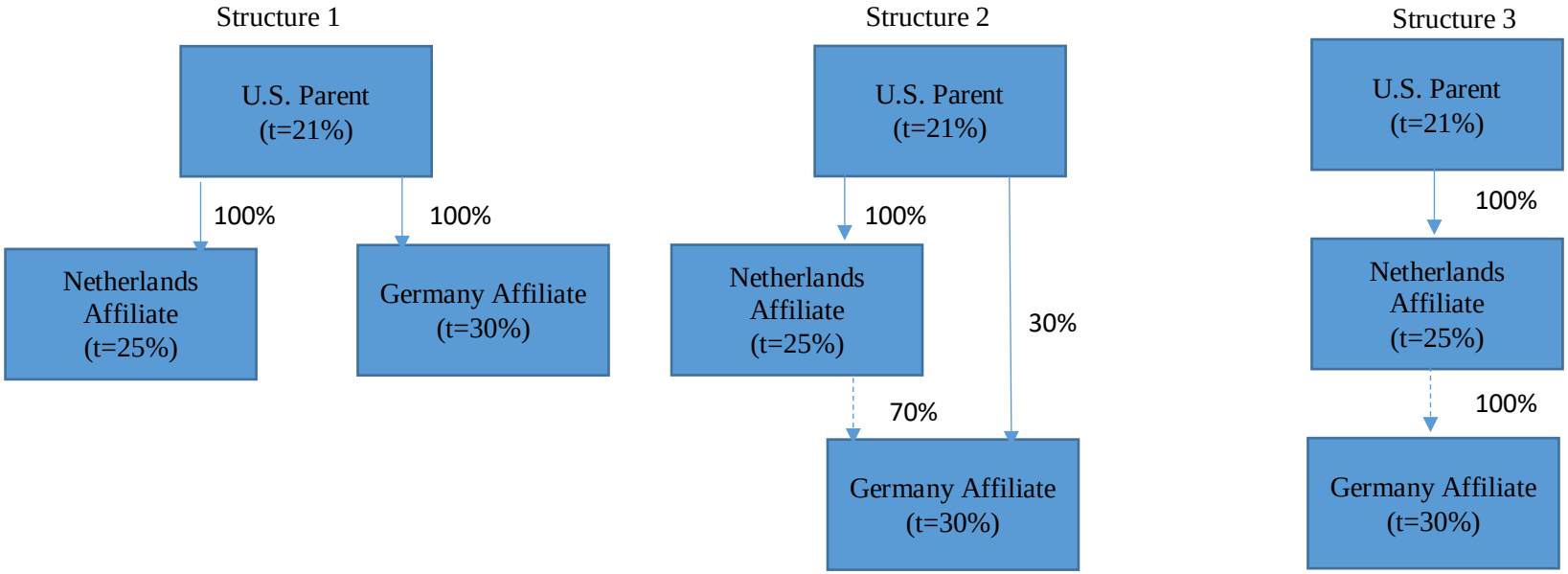
Figure 4
Share of Aggregate Equity Income of U.S. Foreign Affiliates:
Havens versus Other Countries



Data source: U.S. majority-owned foreign affiliate data collected by the BEA and included in the activities of MNEs data series: https://www.bea.gov/international/di1usdop

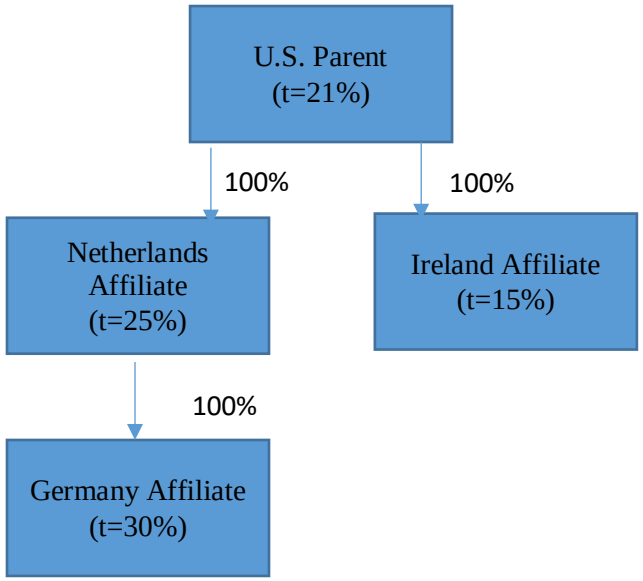
Tax havens: Ireland, Luxembourg, Netherlands, Caribbean, Bermuda, Barbados, Singapore, Switzerland.

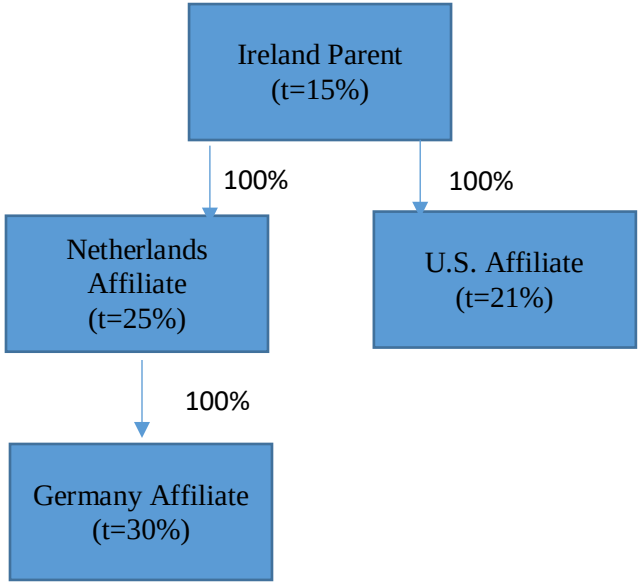
Figure 5
Different ownership structures with same economic ownership



Net Income of the Dutch affiliate:	Pretax Income $ 60 Tax (15) Net Income 45 Eff. Tax Rate 25%	Pretax Income $ 60 **Equity Income 196** Tax (15) Net Income 241 Eff. Tax Rate 5.9%	Pretax Income $ 60 **Equity Income 280** Tax (15) Net Income 325 Eff. Tax Rate 4.4%
Net Income of the German Affiliate:	Pretax Income $400 Tax (120) Net Income 280 Eff. Tax Rate 30%	Pretax Income $400 Tax (120) Net Income 280 Eff. Tax Rate 30%	Pretax Income $400 Tax (120) Net Income 280 Eff. Tax Rate 30%
Direct Investment Income:	Netherlands $45 Germany $280	Netherlands $241 Germany $84	Netherlands $325

Figure 6
Effects of Equity Accounting on National Statistics





Reporting Country	Direction	Counter Party	Amount
U.S.	Outbound	Netherlands	60
U.S.	Outbound	Ireland	30
Netherlands	Outbound	Germany	30
Ireland	Inbound	U.S.	(30)
Netherlands	Inbound	U.S.	(30)
Germany	Inbound	Netherlands	(30)
Net Imbalance			**30**

Reporting Country	Direction	Counter Party	Amount
Ireland	Outbound	Netherlands	30
Ireland	Outbound	U.S.	30
Netherlands	Outbound	Germany	30
U.S.	Inbound	Ireland	(30)
Netherlands	Inbound	Ireland	(30)
Germany	Inbound	Netherlands	(30)
Net Imbalance			**-**

Table 1 – Panel A
Replication of Clausing (2016) - Semi-Elasticity Estimate using Pre-Tax Income (PTI)

VARIABLES	(1) lnincome	(2) lnincome	(3) lnincome	(4) lnincome	(5) lnincome	(6) lnincome	(7) lnincome	(8) lnincome
ETR	**-2.791*** **	**-3.479*** **	**-2.446*** **	**-2.404*** **	**-4.379*** **	**-2.161*** **	**-2.236*** **	**-2.039*** **
	(0.215)	**(0.200)**	**(0.115)**	**(0.134)**	**(0.202)**	**(0.133)**	**(0.128)**	**(0.118)**
lnGDP		0.535***		0.010		1.237***		0.200
		(0.023)		(0.027)		(0.163)		(0.154)
lnGDPpc		0.417***		0.225***		1.942***		1.617***
		(0.031)		(0.021)		(0.224)		(0.204)
lndistance		-0.317***		-0.006				
		(0.067)		(0.045)				
Lnppe			1.125***	1.014***			0.741***	0.497***
			(0.025)	(0.025)			(0.027)	(0.029)
lnemp			-0.400***	-0.280***			0.427***	0.123***
			(0.027)	(0.035)			(0.047)	(0.047)
Constant	8.117***	-6.784***	0.626***	-1.379***	8.570***	-42.889***	0.458***	-17.214***
	(0.075)	(0.677)	(0.134)	(0.530)	(0.063)	(2.330)	(0.162)	(2.437)
Observations	1,559	1,513	1,554	1,512	1,559	1,535	1,554	1,534
R-squared	0.09742	0.46502	0.74212	0.78567	0.69970	0.88897	0.89079	0.91260
country fe	no	no	no	no	yes	yes	yes	yes
Sample	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012

Standard errors in parentheses
***p<0.01, **p<0.05,*p<0.1

Note: *We estimate an average semi-elasticity on 'etr' of -2,72 compared to -2.92 in Clausing (2016).***Variable definitions:** Except for *lnGDP, lnGDPpc* and *lndistance*, all variables are collected from the BEA data series called Activities of U.S. MNEs. *lnincome* is the log of *PTI*, calculated as Net Income plus foreign tax expense as reported in the Activities of U.S. MNEs data series. *ETR* is foreign tax expense divided by *PTI*. *lnGDP* and *lnGDPpc* (per capita income) capture the country's scale and wealth and were collected from the World Bank's World Development Indicators database. *lndistance*, collected from an online calculator (https://www.distancefromto.net/distance-from-united-states-country), is distance in miles from the foreign jurisdiction to the U.S. and is included to control for economic closeness. *lnppe* and *lnemp* are the log of property plant and equipment and number of employees, respectively.

Table 1 – Panel B
Replication of Clausing (2016) – Semi-Elasticity Estimate using Direct Investment Income (DII)

VARIABLES	(9) lnusdia	(10) lnusdia	(11) lnusdia	(12) lnusdia	(13) lnusdia	(14) lnusdia	(15) lnusdia	(16) lnusdia
ETR	**-3.141*** **	**-3.510*** **	**-2.825*** **	**-2.494*** **	**-4.022*** **	**-2.112*** **	**-2.306*** **	**-2.042*** **
	(0.203)	**(0.193)**	**(0.121)**	**(0.148)**	**(0.184)**	**(0.135)**	**(0.138)**	**(0.130)**
lnGDP		0.482***		-0.032		0.953***		0.299*
		(0.022)		(0.029)		(0.163)		(0.167)
lnGDPpc		0.360***		0.214***		1.705***		1.492***
		(0.030)		(0.023)		(0.226)		(0.221)
lndistance		-0.353***		-0.040				
		(0.064)		(0.049)				
lnppe			0.916***	0.825***			0.558***	0.303***
			(0.026)	(0.027)			(0.028)	(0.032)
lnemp			-0.228***	-0.120***			0.388***	0.106**
			(0.028)	(0.038)			(0.052)	(0.051)
Constant	7.598***	-5.171***	1.073***	0.421	7.848***	-33.881***	1.404***	-17.619***
	(0.070)	(0.650)	(0.139)	(0.580)	(0.057)	(2.332)	(0.174)	(2.641)
Observations	1,524	1,497	1,523	1,496	1,524	1,519	1,523	1,518
R-squared	0.13544	0.44656	0.69542	0.71420	0.73107	0.87542	0.86509	0.88570
country fe	no	no	No	no	yes	yes	yes	yes
Sample	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: *We estimate an average semi-elasticity on 'ETR' of -2.81 using DII.* **Variable definitions:** Except for *lnusdia, lnGDP, lnGDPpc* and *lndistance*, all variables are collected from the BEA data series called Activities of U.S. MNEs. *lnusdia* is the log of *DII*, the direct ownership share of net income of directly-owned affiliates as reported in the Balance of Payments data series. *ETR* is foreign tax expense divided by *PTI. PTI* is Net Income plus foreign tax expense from the Activities of U.S. MNEs data. *lnGDP* and *lnGDPpc* (per capita income) capture the country's scale and wealth and were collected from the World Bank's World Development Indicators database. *lndistance*, collected from an online calculator (https://www.distancefromto.net/distance-from-united-states-country), is distance

in miles from the foreign jurisdiction to the U.S. and is included to control for economic closeness. *lnppe* and *lnemp* are the log of property plant and equipment and number of employees, respectively.

Table 1 – Panel C
Replication of Clausing (2016) - Semi-Elasticity Estimate using Adjusted Pre-Tax Income (Adj. PTI)

VARIABLES	(1) lnincomebr	(2) lnincomebr	(3) lnincomebr	(4) lnincomebr	(5) lnincomebr	(6) lnincomebr	(7) lnincomebr	(8) lnincomebr
ETRbr	**-1.192*** **	**-2.527*** **	**-1.438*** **	**-1.620*** **	**-2.940*** **	**-1.601*** **	**-1.545*** **	**-1.507*** **
	(0.210)	**(0.186)**	**(0.102)**	**(0.114)**	**(0.191)**	**(0.116)**	**(0.108)**	**(0.099)**
lnGDP		0.571***		0.026		1.101***		0.045
		(0.022)		(0.023)		(0.148)		(0.136)
lnGDPpc		0.344***		0.134***		1.836***		1.422***
		(0.028)		(0.018)		(0.205)		(0.180)
lndistance		-0.315***		0.011				
		(0.063)		(0.039)				
lnppe			1.036***	0.964***			0.648***	0.462***
			(0.022)	(0.021)			(0.023)	(0.026)
lnemp			-0.285***	-0.201***			0.516***	0.250***
			(0.023)	(0.030)			(0.041)	(0.041)
Constant	7.460***	-7.454***	0.400***	-1.382***	8.045***	-38.663***	0.453***	-11.840***
	(0.081)	(0.649)	(0.116)	(0.473)	(0.068)	(2.097)	(0.137)	(2.146)
Observations	1,517	1,472	1,512	1,471	1,517	1,494	1,512	1,493
R-squared	0.02078	0.43811	0.76997	0.80970	0.68174	0.89102	0.90257	0.92036
country fe	no	no	no	no	yes	yes	yes	yes
sample	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012	1983-2012

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: *We estimate an average semi-elasticity on 'ETRbr' of -1.80 using Adj. PTI.* **Variable definitions:** *lnincomebr* is the log of *Adj. PTI*, Net Income before foreign tax expense and before equity income from the Activities of U.S. MNEs data. *ETRbr* is foreign tax expense divided by *Adj. PTI*. *lnGDP* and *lnGDPpc* (per capita income) capture the country's scale and wealth and were collected from the World Bank's World Development Indicators database. *lndistance*, collected from an online calculator (https://www.distancefromto.net/distance-from-united-states-country), is distance in miles from the foreign jurisdiction to the U.S. and is included to control for economic closeness. *lnppe* and *lnemp* are the log of property plant and equipment and number of employees, respectively.

Table 2 Panel A
Replication of Clausing (2016) – Estimate of Shifted Profits

	Clausing (2016), Table 3, Column 1		Clausing (2016), Table 3, Column 2		Clausing (2016), Table 3, Column 3	
	PTI Reported, $Billion		Estimate of PTI without Shifting, $ Billion		Percent of Total Excess PTI in Location	
Country	*Blouin and Robinson*	*Clausing*	*Blouin and Robinson*	*Clausing*	*Blouin and Robinson*	*Clausing*
Netherlands	$ 169.4	$ 172.3	$ 34.2	$ 33.0	21.6%	23.0%
Ireland	$ 122.5	$ 122.3	$ 23.6	$ 23.6	15.8%	16.3%
Luxembourg	$ 96.2	$ 96.1	$ 14.9	$ 15.0	13.0%	13.4%
Bermuda	$ 86.9	$ 79.7	$ 10.8	$ 9.9	12.1%	11.5%
Switzerland	$ 56.5	$ 57.9	$ 14.4	$ 14.6	6.7%	7.2%
Singapore	$ 42.5	$ 42.4	$ 10.6	$ 10.5	5.1%	5.3%
Caymans	$ 39.5	$ 40.9	$ 8.5	$ 8.7	4.9%	5.3%
All others under 15 percent	$ 201.5	$ 188.6	$ 84.1	$ 89.8	18.7%	16.3%
Total under 15 percent	$ 815.0	$ 800.0	$ 201.0	$ 205.0	98.0%	98.4%
All others with data	$ 264.9	$ 267.0	$ 252.5	$ 257.0	2.0%	1.6%
Total in 2012	$ 1,079.9	$ 1,067.0				

Note: Pre-tax income (PTI) is Net Income plus tax expense from the Activities of U.S. MNEs data. The '15 percent' category above refers to the estimated effective tax rate in each country. This tables uses aggregate BEA data for 2012. The differences in Column 1 arise from our use of revised data versus use of preliminary data in Clausing (2016).

Table 2 Panel B
Replication of Clausing (2016) – Estimate of Fiscal Effects, 2012

	PTI Reported, $ Billion (1)	Estimate of PTI without Shifting, $Billion (2)	Change in Foreign Tax Base, $Billion (3)	Clausing (2016) (4)	
Tax rate less than 15%	815	201	(614)	(595)	(2) - (1)
All other countries	265	252	(12)	(10)	(2) - (1)
All countries	1,080	454	(626)	(605)	(A)
Ratio of foreign affiliate sales with related parties in U.S. to total foreign affiliate sales with related parties outside host country			0.34	0.39	(B) see note
Increase in U.S. Tax Base without Shifting, $Billion (U.S. MNEs)			213	234	(C) -[(A)*(B)]
Ratio of U.S. sales of foreign MNEs to foreign sales of U.S. MNEs			0.60	0.59	(D) see note
Total Increase in U.S. Tax Base without Shifting, $Billion (All MNEs)			340.93	371	(E) (C)+(C)*(D)
U.S. Revenue Loss (assuming a 30% tax rate)			**102**	**111**	**(E)*30%**
% of Corporate Tax Revenue			**42.1%**	**45.9%**	

Note: Pre-tax income (PTI) is Net Income plus tax expense. (B)=472,687/(482,687+917,445) =.34. (D)=4,191,727/6,977,495=.60. Clausing (2016) reports U.S. federal tax revenue in 2012 of $242 billion.

Table 2 Panel C
Adjusted Estimates of Fiscal Effects using Adj. Pre-Tax Income (Adj. PTI), 2012

	Clausing	**Blouin and Robinson**			
BEA income measure used, revised inputs (i.e., eff. tax rates, elasticity)	**PTI**	**Adj. PTI**	**Adj. PTI, eff. tax rates**	**Adj. PTI, elasticity**	**Adj. PTI, eff. tax rates, elasticity**
Aggregate income, $Billion	1,080	467	467	467	467
Change in foreign tax base	(626)	(196)	(92)	(125)	(61)
Ratio of foreign affiliate sales with related parties in U.S. to total foreign affiliate sales with related parties outside host country	34.0%	34.0%	34.0%	34.0%	34.0%
Increase in U.S. Tax Base without Shifting, $Billion (U.S. MNEs)	213	67	31	43	21
Ratio of U.S. sales of foreign MNEs to foreign sales of U.S. MNEs	60.1%	60.1%	60.1%	60.1%	60.1%
Total Increase in U.S. Tax Base without Shifting, $Billion (All MNEs)	341	107	50	68	33
U.S. Revenue Loss, $Billion	**102**	**32**	**15**	**20**	**10**
% of Corporate Tax Revenue	**42%**	**13%**	**6%**	**8%**	**4%**

Note: Pre-tax income (PTI) is Net Income plus tax expense from the Activities of U.S. MNEs data. Adjusted PTI is Net Income plus tax expense less equity income.

Table 3
Adjusted Estimates of Fiscal Effects using Direct Investment Income (DII), 2012

	Clausing	Blouin and Robinson
BEA income measure used	**DII grossed-up (by 57%)**	**DII (as reported)**
Aggregate income, $Billion	919	526
Change in foreign tax base	(463)	(265)
Ratio of foreign affiliate sales with related parties in U.S. to total foreign affiliate sales with related parties outside host country	34.0%	34.0%
Increase in U.S. Tax Base without Shifting, $Billion (U.S. MNEs)	157	90
Ratio of U.S. sales of foreign MNEs to foreign sales of U.S. MNEs	60.1%	60.1%
Total Increase in U.S. Tax Base without Shifting, $Billion (All MNEs)	252	144
U.S. Revenue Loss, $Billion **% of Corporate Tax Revenue**	**76** **31.4%**	**43** **17.8%**

Note: DII is Direct Investment Income from the BEA's BoP data series.

Table 4
Comparisons of Bureau of Economic Analysis data to Treasury's Statistics of Income data

Panel A: Form 5471

	Year 2014					
	BEA Reporting-Based Measures				IRS Form 5471	
	DII	PTI	Adj. PTI	Pre-Tax E&P	Dividends Received from Related Parties	Adj. E&P
Ireland	43,670	119,122	65,100	142,351	24,581	117,770
Luxembourg	41,095	125,227	11,506	101,502	54,552	46,950
Netherlands	70,382	156,963	28,514	130,427	78,837	51,590
Caribbean	24,338	74,943	25,396	31,750	10,773	20,977
Bermuda	34,806	84,222	8,415	90,407	21,286	69,121
Singapore	31,019	50,081	29,532	34,149	8,009	26,140
Switzerland	22,567	73,281	39,662	42,859	5,659	37,200
Amount in all countries	457,122	1,299,387	580,597	946,619	299,063	647,559
% in Tax Havens	59%	53%	36%	61%	68%	57%

Note: DII is Direct Investment Income from the BEA's BoP data series. PTI is Net Income plus tax expense from the Activities of U.S. MNEs data. Adj. PTI is Net Income plus tax expense less equity income. Adj. E&P is Pre-tax E&P less related party dividends.

Table 4 (cont.)

Panel B: CbyCR – Form 8975

	Year 2016			
	BEA Reporting-Based Measures			IRS Form 8975
	DII	PTI	Adj. PTI	Pre-Tax Income
Ireland	52,366	150,688	76,918	31,390
Luxembourg	34,819	99,812	(943)	(2,139)
Netherlands	72,130	190,697	15,108	37,642
Caribbean	26,279	58,885	13,925	26,082
Bermuda	41,554	75,734	(1,429)	24,900
Singapore	25,002	42,473	27,077	29,040
Switzerland	30,321	68,650	41,521	(6,204)
Amount in all countries	427,542	1,102,464	421,036	552,660
% in Tax Havens	66%	62%	41%	25%

Note: DII is Direct Investment Income from the BEA's BoP data series. PTI is Net Income plus tax expense from the Activities of U.S. MNEs data. Adj. PTI is Net Income plus tax expense less equity income.

Table 5
Financial Statement Information

	Financial Statements		BEA		IRS Form 5471	
	Pre-tax Foreign Income	Foreign Tax Expense	Adjusted PTI	Taxes	E&P Minus Related Party Dividends	Foreign Taxes
2008	425,328	156,487	392,489	140,644	661,692	125,226
2009	363,309	105,492	373,534	109,424	N/A	N/A
2010	470,953	135,464	487,815	130,000	644,540	114,435
2011	546,533	159,687	565,270	163,878	N/A	N/A
2012	523,640	153,705	537,594	152,667	670,333	130,815
2013	520,364	144,904	511,432	138,607	N/A	N/A
2014	511,638	131,777	580,597	133,164	647,556	121,633
2015	436,545	106,637	428,446	91,422	N/A	N/A
2016	443,818	100,487	421,036	86,905	N/A	N/A

Note: Pre-tax Foreign Income is aggregate PIFO from Compustat and Foreign Tax Expense is aggregate TIFO from Compustat for all firms with totals greater than $10 million and non-missing foreign pre-tax income (PIFO) or non-missing foreign tax expense (TIFO). Adjusted PTI is Net Income plus tax expense less equity income from the BEA's Activities of U.S. MNEs data. Taxes is aggregate tax expense from the BEA's Activities of U.S. MNEs data.