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)

April 2020

Abstract: Putting an end to the base erosion and profit shifting (BEPS) activity of multinational enterprises (MNEs) is high on national agendas. Influential work in academic and policy circles suggests that the magnitude of BEPS problem is large. We show that these magnitudes are overstated due to the accounting treatment of indirectly-owned foreign affiliates in the BEA's U.S. international economic accounts data. Our work has far-reaching implications, as the U.S.' international economic accounts data consistently apply an accounting convention that can make international comparisons difficult. We explain how this accounting treatment leads to double counting of foreign income and to its misattribution to incorrect jurisdictions. 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 4-13% of corporate tax revenues lost to BEPS activity of MNEs (Clausing 2016).

JEL codes: H32, M41, O50

Keywords: base erosion and profit shifting, measurement, accounting, foreign direct investment

---

1. Introduction

Under the Organization for Economic Cooperation and Development (OECD)/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS), over 125 countries are collaborating to put an end to tax strategies that artificially shift profits to low or no-tax locations. The range of estimates of annual global tax revenue losses due to BEPS is large (see Bradbury et al. 2018): from $80 billion to $280 billion. Country-specific estimates of BEPS fiscal effects also vary widely with studies reporting U.S. tax revenue losses in the range of $57 billion to $188 billion per year (see Tørsløv et al., 2020).[1] Consequently, one of the BEPS project action items, Action 11 Report (OECD 2015), *Measuring and Monitoring BEPS*, focuses on gathering and improving data and analyses to capture the quantitative impact of BEPS.

Our objective is to improve the measurement of BEPS and its fiscal effects by explaining the accounting for the activity of multinational enterprises (MNEs) foreign operations, an important feature of country-level financial data. There has been extraordinary effort put forth in developing methods to measure abusive tax planning behavior; with significantly less emphasis on gauging data quality and comparability. In our study, we examine the U.S. data that produces one of the most-cited estimates of BEPS fiscal effects and highlight several measurement issues of which users of these data should be aware. In particular, we note that the failure to make important adjustments will significantly bias these estimates upwards. To illustrate the impact of our adjustment, we offer revised estimates of the U.S. fiscal effects that are about one third of the estimates cited in prior studies. Several developments make our work both timely and salient. For example, our measurement recommendations affect work stemming from the immense interest in

---

[1] These estimates are important for evaluating the distributional consequences of profit shifting, the extent to which profit shifting impacts domestic productivity measurement, and the effects of BEPS countermeasures. For example, authors use these estimates to calibrate general equilibrium models that simulate the impact of proposed reforms such as reallocating profits to destination markets or minimum effect tax rates (e.g., Laffitte et al. 2019).

the impact of U.S. tax reform and proposed tax reforms by the OECD, greater accessibility to U.S. government data by researchers, and the trend towards combining U.S. data with the data of other countries to potentially enhance our understanding of BEPS.

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 et al. (2019, p. 15). BEA data is the source of the U.S.'s international economic statistics and is often used in profit shifting studies. The data offer three income measures that all 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 will draw incorrect inferences.[2]

Much of the public discourse surrounding profit shifting is fueled by simple descriptive analyses generated from aggregate BEA data. For instance, Zucman (2014; 2015) reports that 55% of foreign affiliate profits were in tax havens in 2013, Clausing (2016) reports that 50% were in havens in 2012, and Sullivan (2004) reports that figure at 58% 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)".[3] However, there is a body of empirical work suggesting that a more

---

[2] See https://www.bea.gov/research/special-sworn-researcher-program
[3] 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.

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 profit shifting literature.

Most of the empirical profit shifting research identifies BEPS by studying the tax sensitivity (or elasticity) of reported income with respect to the tax rate differential across countries. 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 relatively lower tax rates is consistent with profit shifting. A consensus estimate, based on a meta-regression study by Heckemeyer and Overesch (2013), is 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% would shift an additional 8% or $80,000 of income into that jurisdiction.

Our study helps reconcile the descriptive and empirical analyses described above. As we explain in detail, the large share of aggregate income that academic work attributes to tax havens arises from a misinterpretation of the way that the BEA's U.S. international economic accounts data are collected and reported.[4] In particular, the confusion stems from the accounting treatment of the activity of U.S. MNEs' indirectly owned foreign affiliates. Indeed, the accounting issue we address here is potentially endemic to all country-level financial data to varying degrees. Any financial data that requires business entities to disaggregate profits by jurisdiction must have an established method to report the activity of the indirectly-owned affiliates of its MNEs. While the current study focuses on measurement issues when using the U.S. BEA data, our study also

---

[4] In response to the concerns and recommendations contained in our study, the BEA recently published a FAQ: https://www.bea.gov/help/faq/1402

considers how this accounting issue affects other U.S. data sources. Blouin and Robinson (2020) extends the present analysis to examine cross-country comparability in international statistics.

Statistics on MNE activity must report activities contained within ownership structures that exhibit common control but span multiple countries. For example, a U.S. parent owns a foreign affiliate (P) that often owns another foreign affiliate (A). So, affiliate P is the 'direct' parent of affiliate A, while the U.S. parent is the indirect parent. For the U.S. parent's BEA reporting, affiliate P is required to report the income of affiliate A on its own income statement, while at the same time affiliate A will also report its own income. This income of A on P's books is referred to in the data as 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 owned by the U.S. parent). Equity income is neither dividend income nor does it represent an asset (cash or otherwise) flow between two foreign affiliates. It is only an accounting construct that arises when MNEs must report affiliate-level financial data by jurisdiction.

Over the last 30 years, equity income has been a growing component of BEA data. This is in large part 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 comprised 67% of the aggregate foreign affiliate income for U.S. MNEs. So, in 2016, two-thirds of foreign profits in the aggregate BEA data are reported in at least two different countries – once in the country of the affiliate parent and once in the country of the affiliate that generated the profit from its underlying operations. Adding further complications for profit shifting work, equity income is disproportionately reported in tax havens stemming from the

use of tax havens as foreign holding companies.[5] We show that in addition to accounting for the same dollar 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 each jurisdiction.

The first academic warning of the potential for "double counting" income in BEA data 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 (2009,2011,2016,2020), GAO (2008), and Beer et al. (2019). Clausing, one of the most prolific authors on the U.S. fiscal effects of BEPS using BEA data, claims it is not possible to correct for double counting and proposes her own solution that she emphasizes should be viewed as an overcorrection.

How overstated shares of income reported in tax havens translate into fiscal effects depends on the underlying data and the method. But, to date, each of the papers studying the aggregate revenue lost to BEPS fails to correctly consider equity income in the analysis. 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).[6] 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% of foreign affiliate income is earned in tax havens resulting in a revenue loss of $130 billion a year

---

[5] Borga and Mataloni (2001) were one of the first to point out that the increasing use of tax haven affiliates serving as foreign parents makes it challenging to infer the economic activity of U.S. MNEs using BEA data. These holding companies are also referred to as 'special purpose entities', which are defined as entities that are directly or indirectly controlled by foreign owners and have their assets and liabilities primarily in other countries (Mohlmann et al. 2019).
[6] 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.

(41.4% of U.S. tax revenue in 2013). Our revised estimate after adjusting for equity income is only $80 billion (25.4% of U.S. tax revenue in 2013).

Variation in how the income of indirectly-owned affiliates is captured in financial data of MNEs should be a global concern. Whether countries compile their international statistics through enterprise surveys, financial accounting data, or both, any economic data that requires MNEs to disaggregate profits by jurisdiction must have an established method to report the activity of indirectly-owned affiliates.Our preliminary reviews suggest that these methods are not comparable across countries. This highlights the challenge of interpreting results from studies that compare international statistics across countries and associate so-called data 'bilateral FDI asymmetries' with tax-motivated profit shifting (e.g., Tørsløv et al. 2020). We also note that caution is warranted when using other data sources such as Bureau van Dijk and U.S. tax return data, including the newly collected country-by-country reporting data. Each of these sources report financial data for MNEs' foreign affiliates that includes activity from indirectly-owned affiliates. In sum, we emphasize the importance understanding any data source's accounting for indirectly-owed affiliates before undertaking any profit shifting study.

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 BEA's accounting method for indirectly-owned affiliates and how it affects the two BEA data series 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 these issues in non-BEA data sources and assert this as a global concern.

2. Background and related literature

Academics, governments, and policy organizations are all very active in producing empirical estimates of profit shifting. Recent reviews of 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 profit shifting exists, there is a lack of consensus over its scale.

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 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. (2020), Cobham and Jansky (2018), Jansky and Palansky (2019), Guvenen et al. (2019), Bolwijn et al. (2018) and Bilicka (2019). Moreover, at least three international organizations recently developed estimates of the budgetary impact of international corporate tax avoidance for most of the world economy including the OECD (2015), the International Monetary Fund's

(IMF's) Crivelli et al. (2016) and United Nations Conference on Trade and Development (UNCTAD) (2015).

Of particular interest are the recent studies that document a wide range of estimates. Globally, Bradbury et al. 2018 reports that short-run estimates of fiscal losses range from $80 billion in Jansky and Palansky (2019) to $280 billion in Clausing (2016). For just the U.S., annual revenue loss estimates range from Tørsløv et al. (2020)'s of $57 billion, Clausing (2016)'s $94 billion to Crivelli et al. (2016) and Cobham and Jansky (2018)'s $189 billion. Even estimates by the same author vary over time. For instance, Zucman (2014, 2015) reports a U.S. revenue loss to BEPS of $130 billion annually *related only to profit shifting by U.S. MNEs*, but in Tørsløv, et al. (2020), the U.S. revenue loss to BEPS is $60 billion *related to all MNEs*. Said another way, it is not possible that the U.S. loses 230% more tax revenue to U.S. MNEs that it does to U.S. and non-U.S. MNEs. Even more perplexing is that the estimate in Tørsløv, et al. (2020) considers more tax havens than Zucman (2014, 2015) (e.g., Belgium, Puerto Rico, Hong Kong, Malta), yet finds a lower U.S. fiscal loss. Clearly, more careful work is needed.

In general, studies attempting to derive global fiscal estimates of BEPS use macroeconomic data. This reflects a combination of data accessibility, the desire to include developing countries and tax havens in the analysis (where microdata are generally lacking), and the desire for comparability across countries. The source of U.S. macroeconomic data is the BEA survey data. 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.[7] Despite this recent trend towards using macroeconomic data, there appears to be little focus on the fact that many

---

[7] 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.

countries aggregate statistics derived from micro-level financial (or sometimes tax return) data. For instance, the BEA publishes aggregates of affiliate-level financial statements collected only from BEA surveys that follow a specific set of accounting principles. Yet, there is an extensive literature in accounting describing the how income measurement varies across countries.

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 across jurisdictions. Financial statement information is a widely accepted proxy for the location of taxable profits because tax return information is difficult to access. Our broad message in this study is that researchers using macroeconomic data to infer the amount and location of reported profits must understand how data source's profits are measured.

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

The U.S. BEA publishes annually various aggregate statistics from international economic accounts. Specifically, 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 data.[8] 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 certain size threshold. Benchmark surveys, conducted every five years, have lower reporting thresholds.[9]

---

[8] (1) https://www.bea.gov/international/di1usdop; (2) https://www.bea.gov/international/di1usdbal
[9] See https://www.bea.gov/data/economic-accounts/international

All BEA surveys require U.S. MNEs to report financial statement data using U.S. Generally Accepted Accounting Principles (GAAP). GAAP recommends three methods for reporting activity associated with investment in affiliates (i.e., equity ownership interests), depending on the level of control that the parent exerts over an affiliate. Properly interpreting the two BEA data series to study profit shifting requires researchers to have an understanding of these accounting methods, and how they are applied by the BEA in their aim to capture the location of the economic activity of U.S. MNEs.

3.1. Accounting for investments in affiliates

The three methods permitted by U.S. GAAP for investments in affiliates are i) consolidation, ii) the equity method, or ii) the cost method. For the purpose of reporting to capital markets, U.S. GAAP recommends full consolidation when the parent company controls the affiliate (owns more than 50%), the equity method when the parent company owns between 20% and 50%, and the cost method when ownership falls below 20%. However, in the context of constructing international economic accounts data, the BEA requires that MNEs use the equity method of accounting to record *all activity associated with investments in foreign affiliates.*[10] Thus, every parent-affiliate relation that exists within a U.S. MNE must be accounted for using the equity method, including when foreign affiliates are parent companies of other foreign affiliates. The

---

[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%, 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% must use the cost method, but these are relatively rare. Equity investments less than 10% are treated as portfolio investment rather than direct investment and are not in these data.

reason for this deviation from U.S. GAAP is that the equity method captures economic activity by country in a consistent and transparent fashion.

The equity method of accounting is best understood by contrasting it with consolidation and the cost method. We focus only on the income statement, although the balance sheet will also differ across these methods.[11] *Consolidation* requires that a parent report all of the revenues and expenses of its affiliates along with its own activity in its financial statements. Each line item on the parent's income statement comingles the activities of the parent and its affiliates.[12] 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 as "equity income". Equity income is recorded without regard to the timing of any dividend distributions. As explained in the examples below, the equity method of accounting provides a simple way for the BEA report the location of operating income, or economic activity by country, within an MNE.

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 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 reported. 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 affiliate, pretax income is subject to tax in the country of origin. In addition, assume the German

---

[11] 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 affiliate asset measures and foreign direct investment *position* data.

[12] 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.

affiliate pays a $10 dividend to its Dutch parent. Since the Netherlands uses a participation 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 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 German 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 of the German affiliate's income will be reported 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*

12

Business, a BEA publication that includes a variety of articles, including detailed presentations about recent data releases, explanations of annual and benchmark updates, and methods used to produce key estimates of items such as trends in the value of production.[13] Affiliates are included in these data so long as the affiliate is owned at least 10% (either directly or indirectly) by the U.S. parent (the threshold to be considered direct rather than portfolio investment).[14]

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.[15] The BEA compiles these data for the IMF, the OECD, and UNCTAD that publish these statistics.

---

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

[14] 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%).

[15] 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

The BoP has many components. *DII* is a component of the current account, which includes investment income on direct investment, i.e., debt and equity investments in a foreign affiliate by the direct investor.[16] The income, whether distributed or reinvested in the foreign affiliate, is proportionate to the direct investor's ownership interest in the affiliate resulting in important differences between this data series and *NI*. Here, the focus is on U.S. parents' direct ownership of their affiliates rather than total affiliate ownership. 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*. Moreover, if an affiliate is entirely indirectly owned by the U.S. parent via an intermediate affiliate, *DII* will report the indirectly-owned affiliate's activity only in the country of the intermediate affiliate.[17]

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 the *DII* 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. Information about tax expense is not captured in *DII*. Pre-tax income and effective tax rates cannot be determined. Perhaps most problematic is that total income reported from the Netherlands can no longer be separated into Dutch operating income and Dutch equity income (which is operating income in another country). In our example, 86% of the *DII* from the Netherlands is actually income from simply holding an affiliate located in Germany.[18]

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

[16] Income on debt and equity investment abroad in unaffiliated entities is considered portfolio income, a separate component of BoP. Ownership of 10% or more constitutes a direct investment.

[17] 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.

[18] 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.

4. Which BEA income measure is best suited to examine profit shifting?

Three measures of income from the BEA data appear in the profit shifting literature – *Net income*, *Direct investment income*, and *Profit type return*. Researchers obtain the first two measures directly from the BEA survey data (described in Section 3.2 and 3.3). Profit type return (described below) is an income measure derived from the Net income data series, and calculated by the BEA since 1994 to study value added of foreign affiliates in their country of location. We argue that none of these measures are appropriate for studying profit shifting and propose a fourth measure. While each of these income measures do have merit for particular objectives, only our proposed measured is appropriate to study profit shifting.

4.1. Our recommendation: *Adjusted pre-tax income*

We recommend a measure of income to study profit shifting that we call *Adjusted Pre-Tax Income* (*Adj. PTI*). The researcher must calculate this measure (which is very straightforward) using the Activities of U.S. MNEs data. Above, we highlighted why the two BEA income measures obtained directly from the two data sources – *NI* and *DII* – suffer from problems that limit their usefulness in studying profit shifting. *NI* double counts profits, while *DII* does not source income to the appropriate countries and is only reported after-tax. *Adj. PTI* solves both problems.

Adj. PTI makes two adjustments to *NI*. First, equity income is removed from *NI*, obtaining what we call *Adjusted Net Income* in the far right example shown in Figure 1 Panel C. This example demonstrates that *Adjusted Net Income* results in income being attributed to the country where it is earned and allows researchers to correctly estimate the applicable effective tax rate. *Adjusted Net Income* can be transformed into a pre-tax income measure because the tax expense shown in the data now maps to *Adjusted Net Income*. A comparison of Figure 1 Panel A to *Adjusted Net Income* in Panel C illustrates that our suggested measure correctly reports the affiliates' economic

activity. Our *Adj. PTI* measures showing on the far right of Panel C of $60 and $400 in the Netherlands and Germany, respectively, reflects the amount and location from Panel A.

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. We also include 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 'largest' tax havens drops significantly but the income in two of the U.S.'s largest trading partners, Canada and the UK, is virtually unchanged. In Figure 3, we revise Figure 2 from Zucman (2014) to include our *Adj. PTI* measure. Note again, that the amount of income reported in the Netherlands, Luxembourg and Bermuda falls precipitously while Ireland's share increases. Zucman (2014) reports that approximately 55% of all foreign profits in 2013 are in the handful of tax havens reported in this plot, yet the actual percentage is only 35%. In summary, the literature often paints an inaccurate picture with respect to the share of foreign profits earned in tax haven countries.

4.1.1. *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, because 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), equity income is concentrated in tax havens. 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, equity income constitutes $681 billion of the aggregate foreign affiliate net income earned by U.S. MNEs of $1,016 billion. This means that 67% of 2016 aggregate *NI* is included in the data more than once.[19] That percentage has averaged 19, 31, 59, and 65 percent over the last four decades, respectively. Figure 4 reveals that U.S. foreign affiliates' portion of equity income in tax havens has increased from approximately 20% in 1982 to almost 80% in 2016. The increasing levels of equity income in tax haven countries implies that recent studies on profit shifting that fail to accurately take into account equity income will yield biased estimates of BEPS-related revenue losses.

4.2. *"Adjusted-Adjusted" pre-tax income:* **The BEA's profit type return**

Since 1994, the BEA reports another measure of income called profit type return (*PTR*). *PTR* is computed as follows - "*NI* (before income taxes or depletion charges), excluding capital gains and losses, income from equity investments, and other non-operating income…and includes an inventory valuation adjustment." The measure was introduced by the BEA to address, in part, their desire to improve their measurement of economic, or "value-added," activity in foreign affiliates of U.S. MNEs. Although this measure is conceptually similar to our recommended measure, *Adjusted Pre-Tax Income*, because *PTR* includes many additional adjustments to *NI* (beyond adding back income taxes and removing equity income), it has some significant differences that reduce its usefulness for studying BEPS. Interestingly, while Clausing (2020)

---

[19] 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.

declares it "not suitable for estimating the overall size of profit shifting" (pg 4), both Wright and Zucman (2018) and Saez and Zucman (2019) use this measure to study profit shifting.

Figure 5 Panel A compares *PTR* and *Adj. PTI*. Note that this comparison begins in 1994 when *PTR* is first reported by the BEA.[20] In aggregate, the measures appear to be very similar. But the aggregate measures mask significant within country variation. Panel B provides the comparison of *PTR* and *Adj. PTI* for Canada, Netherlands, Germany and UK Caribbean. For Canada, notice that the difference between *Adj. PTI* and *PTR* as a percentage of *PTR* vary from -20% to 25%. The differences in the measures for Netherlands is even larger. For expositional ease, the percentage difference in the graphs was truncated to fall between -100% and 100%. In the last five years of the graph, the percentage difference between *PTR* and *Adj. PTI* for the Netherlands has been as high as 425% and as low as -82%.

Zucman switches from *DII* in earlier work (Zucman 2004, 2005) to *PTR* in Wright and Zuman (2018) and Saez and Zucman (2019).[21] While we agree that *PTR* is preferred to *DII* as a measure of profits, the failure to highlight the change in measure in recent work is disingenuous. Moreover, it is unclear to us why these authors do not rely on *Adj. PTI* which seems to be a better proxy affiliate income.

5. Using U.S. international economic accounts to measure profit shifting

5.1. PTI versus Adjusted PTI

In this section, we focus on a series of studies by Clausing over nearly a decade that use pre-tax *NI* instead of *Adj. PTI* (Clausing 2009,2011,2016). As we described earlier, failing to

---

[20] We are uncertain how both Wright and Zucman (2018) and Saez and Zucman (2019) obtain PTR before 1994.
[21] Additionally, Wright and Zucman (2018) and Saez and Zucman (2019) exclude the oil industry and add Puerto Rico as a tax haven. By making these adjustments, this work masks the magnitude of the overstatement of profit shifting found in Zucman (2004, 2005). We should also note that it is puzzling that these papers report Puerto Rico activity even though the BEA does not provide Puerto Rican activity. They appear to combine U.S. Treasury data with BEA data, but Puerto Rican profits have been available in U.S. Treasury data for a decade.

exclude equity income double counts foreign affiliate profits when using the Net Income data series. Through replication and revision to her estimate of the U.S. fiscal effects of BEPS, we illustrate the significance of failing to exclude equity income. Clausing's estimates are roughly one third of what she reports when foreign affiliate profits are not double counted.

Failing to adjust for equity income biases all of her inputs towards finding large fiscal effects of BEPS. Clausing's methodology used in each study has three critical inputs: (i) foreign affiliate profits, (ii) foreign effective tax rates, and (iii) the tax sensitivity of reported income. The first input is the pre-tax income or "*PTI*" (*NI* plus tax expense) in each location. The second is calculated using *PTI* and tax expense in each location. The third is the semi-elasticity of reported income to tax rates, which is determined by the first two inputs in a regression framework.

Table 1 summarizes the results of our replication and revision. Section A.1 of the Appendix provides important details and nuances underlying this exercise. Column 1, which uses *PTI* to measure aggregate foreign income by country, is our starting point and is our replication of the estimate offered in Clausing (2016). Following Clausing's method and use of the data, we estimate a 42% U.S. corporate tax revenue loss to profit shifting. Clausing reports an estimate of 45.9%. Our replication estimate is slightly lower than what Clausing reported because Clausing used preliminary data published by the BEA whereas we use revised data.[22]

Next, we offer revised estimates using *Adj. PTI* in the final four columns of Table 1. We revise the reported estimate in steps because her failure to exclude equity income produces multiple compounding sources of measurement error. For example, failing to remove equity income will artificially increase profits and at the same time artificially decrease effective tax rates, resulting

---

[22] The difference between preliminary and revised data published by the BEA can be significant. Authors using BEA data often use preliminary data for the most recent year to make their study as up to date as possible. However, researchers should be aware that once the final data are published, other researchers will not be able to replicate their work and the results may in some cases change significantly depending on the study.

in an overstated semi-elasticity estimate. This semi-elasticity estimate is then multiplied by the tax rate differential between the foreign affiliate and the U.S. parent (which is overstated) to determine a tax responsiveness, and so on...[23] As equity income affects multiple facets of the revenue loss estimate, we change one input at a time in our revised calculations.

In column 2, we estimate shifted profits (using her method) using *Adj. PTI*, but effective tax rates and semi-elasticities derived from using *PTI* (as in Clausing). Comparing the estimate in column 1 to the estimate in column 2 provides a sense of the impact of double counting on revenue loss estimates. Simply removing equity income from the measure of foreign affiliate profits in each country and changing nothing else reduces the estimate of tax revenue losses from 42% to 13% of corporate tax revenue. This suggests that any fiscal estimates using *PTI* are materially different from those using income appropriately reporting the income's jurisdiction.

In column 3, when we adjust the income measure *and* correct the estimate of effective tax rates (but use the overstated semi-elasticity estimate), the revenue loss is further reduced to around 6%. 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 8%. Thus, the measurement error in foreign effective tax rates appears to have a larger effect than the semi-elasticity estimate. Interestingly, while the profit shifting literature often debates elasticity estimates, we find that the elasticity has little influence on Clausing's final fiscal estimate as compared to the failure to consider how equity income affects the level of reported income and the measurement of the effective tax rate.

---

[23] That tax responsiveness is then applied to foreign affiliate profits to determine the change in the foreign tax base attributable to BEPS that ultimate determines the U.S. revenue loss. 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. See Section A.1 of the Appendix for details.

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%. Thus, we believe that a more realistic estimate of the U.S. revenue loss is somewhere between 4 and 13%, with the lower end estimate of 4% correcting for all sources of measurement error arising from equity income using her method. The OECD Action 11 report noted in the Introduction of our paper estimates global corporate income tax revenue losses of between 4% and 10% of global tax revenues. In this context, an estimate of U.S. losses at 4% seems appropriate, particularly since profit shifting responses are shown to be stronger in less developed countries (Johannesen et al. 2018).

5.2. Is Direct Investment Income (DII) a good alternative to PTI?

In this section, we focus on studies that use *DII* to assess profit shifting, including again the work of Clausing. Before we describe these studies in detail, we illustrate in some detail how equity income affects *DII* data in Figure 6 so that we may refer back to it in the subsequent discussion. Figure 6 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.

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. In

contrast, Structure 3 (100% direct ownership of Germany) will result in the direct investment series reporting the entire $325 in the Netherlands.

In summary, Figure 6 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 an MNE's ownership structure potentially leading some researchers to misinterpret their findings.

5.2.1.   *Zucman (2014, 2015)*

In Zucman (2014) and his 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 assumptions based on the *DII* data: (i) total pre-tax foreign profits of $650b, (ii) 55% of those profits "come from" six tax havens, and (iii) those profits were taxed in those tax havens at a very low (or no) tax rate. Thus, $650b*55%*35% equals approximately $130b, which is Zucman's estimated 2013 revenue loss. However, a significant amount of DII income reported in tax haven countries is earned (and taxed) elsewhere. Replacing *DII* with *Adj. PTI* reduces his estimate to $80b highlighting again the importance of how one interprets equity income in the BEA data. To our knowledge, this estimate has never been retracted and continues to be cited.

5.2.2.   *Clausing (2009, 2011, 2016, 2020)*

In each of her papers, Clausing acknowledged that *PTI* results in 'some form of' double counting. This leads Clausing to rely on *DII*, 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* includes equity income of directly-owned affiliates and therefore misreports the *location* of MNEs' foreign earnings. As before, we describe her method and our replication in detail in Section A.2 of the Appendix.

Table 2 summarizes the results of our replication and revision of Clausing's (2016) estimate of the fiscal effects of profit shifting using *DII*. In Column 1, we estimate a U.S. revenue loss of $76 billion, as compared to Clausing's (2016) reported estimate of $77 billion. In Column 2, we offer a revised estimate of $43 billion. As Clausing notes that her estimate using *DII* is a lower bound and her estimate using *PTI* is an upper bound, we compute a ratio of the estimates in Table 2 to the estimates in Table 1. Clausing's estimate in Table 2 is only 70% ($77/$111 billion) of her estimate from Table 1, while ours is 42% ($43/$102 billion).[24] This implies that her alternate estimate using *DII* should have been much lower than what she reported, making the range of her estimates arguably too wide to be useful for policy making.[25]

It is unclear why using *DII* is a sensible solution to the double counting problem that arises from using *PTI*. Instead, simply adjust *PTI* by subtracting equity income, which is provided in the published BEA data. Using *DII* provides a lower fiscal estimate only because aggregate foreign profits are lower. However, it is not an appropriate way to detect profit shifting because the distribution of reported profits depends on the organizational structure of MNEs' foreign affiliates as shown in Figure 6. One can see from comparing our estimate in Table 1 versus Table 2 that 17.8% is still quite a bit higher than 4%, our preferred estimate using Clausing's method.

---

[24] 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. This emphasizes the effects of using the wrong income measure.

[25] Through our replication and discussion with BEA staff, we discovered that Clausing's lower bound estimates using *DII* is overstated due to an improper gross-up procedure that artificially inflates the aggregate amount of reporting *DII* from $526b to $919b. 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. Of note is that Clausing (2020) ceases to use the gross-up procedure for *DII* and no longer presents estimates using PTI. However, Clausing also changes several things about her method making it impossible for researchers or policy makers to compare her current estimates with her previous estimates. See Section A.2 of the Appendix for details.

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. By inference, this suggests that measures of other countries' productivity are biased upward. 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 U.S. 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 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 view the authors' apportionment exercise as reasonable, 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 6. 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 and apportioned to the U.S. ($45-32.50) and $117.50 ($280-162.50) to be removed from Germany and

apportioned 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 apportioned to the U.S. The authors suggest that this represents profits that have been artificially shifted out of the U.S. However, in reality, only $45 was earned in the Netherlands, so only $12.50 of profits can be shifted out. Referencing similar figures from their study, approximately $9.8 billion of *Adj. PTI* was earned in the Netherlands (or approximately $15.8 billion using *PTR*) but yet $77.9 billion is removed from the Netherlands. 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 (2019) 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 equity income stemming from changing complexity in ownership structures rather than staggering increases in profit shifting.

Unfortunately, Guvenen et al. (2019) do not provide details about the extent of the positive adjustments (such as Germany from our example). Rather, they aggregate the negative adjustments and imply that these amounts represent income that has been artificially shifted in the U.S. We argue that this is very 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 represents equity income that should first to assigned to its source country. This is based on the proportion of equity income observed in directly owned tax haven entities. Despite having access to micro-data, the authors make no attempt to determine the country in which the income was actually earned.

6. Comparisons of BEA data with other data sources

Profit shifting research commonly uses three additional sources for measures of MNE's foreign activity. First, the U.S. Treasury publishes aggregate information on U.S. MNEs' international operations collected from tax returns. Second, detailed financial statement 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.

6.1. U.S. Treasury Data from the Statistics of Income

We begin by comparing our *Adj. 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.[26] Beginning in 2016, taxpayers are also required to file Form 8975, 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.

6.1.1.   Form 5471

Treasury reports aggregate assets, revenues and earnings and profits (E&P) of all CFCs on Form 5471 on a biennial basis.[27] Aggregate assets and revenues are reported using accounting information that follows GAAP.[28] 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).[29] A dividend received from an affiliate E&P. This reporting somewhat mimics the cost method of accounting from Figure 1. Recall that the $10 dividend paid from Germany to the Netherlands

---

[26] 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.

[27] SOI data is only published in aggregate biennially in even years. The most recent year of the data is 2016.

[28] 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.

[29] 2018 Forms 5471 will also include the reporting for the new Global Intangible Low-Taxed Income tax.

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, we report the aggregate 2016 E&P from Form 5471 for seven haven countries along with the BEA measures described above. We've included the aggregate E&P with and without the related dividends. Notice that aggregate foreign pre-tax E&P without related dividends is roughly $285 billion higher than the BEA *Adj. PTI*. This could be attributable to more foreign activity being reported to the IRS or because of duplicated Form 5471 filings (see footnote 26). But what is striking is that the SOI data reports substantially more activity in havens than BEA *Adj. PTI*. 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.[30]

For tax planning purposes, many companies establish disregarded entities. 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 incorrect. Dowd, Landefeld and Moore, (2017) explain that there is no way for researchers using the Treasury data to ascertain with certainty the income from disregarded entities 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 in Treasury data.

---

[30] See Blouin and Krull (2019) for a detailed discussion of tax planning utilizing check-the-box.

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 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.[31]

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.

6.1.2.   Form 8975 (Country-by-Country Reporting or 'CbyCR')

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 rather than tax reporting. Unlike the U.S.'s Form 5471, CbyCR reporting guidance requires data to be collected in a manner intended to eliminate any double counting of the activity of downstream affiliates.

---

[31] 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.

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, 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, only two years of CbyCR is available. Second, although the U.S. requires CbyCR reporting to be based on MNEs' audited financial statements, other countries allow the reporting of the information based using audited financials, statutory reporting, managerial reporting or even regulatory reporting.[32] An MNE is simply required to use the same reporting conventions year over year. This limits 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 reports its proportional share of the partnership's income on its CbyCR where the partner is subject to tax.[33] Notice that any income included in the partner's CbyCR report is double counted.

Table 3 provides a comparison of CbyCR to the other BEA income measures. Interestingly, the CbyCR data is more similar to our *Adj. PTI* measure both in terms of aggregate income and

---

[32] See page 32 of BEPS Action Item 13 for a description of recommended CbyCR data sources.
[33] See the instructions of Form 8975 for an example of how stateless income is reported by conduit entities.

the proportion of aggregate income earned in tax havens. DII, PTI and Adj. E&P from Form 5471 significantly overstate the amount of income earned in tax havens. Using the CbyCR as a benchmark, it clearly appears that Form 5471 data fails to accurately report the location of income.

6.2. U.S. Financial Accounting Data

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 along with 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.[34] However, we can compare aggregate foreign pre-tax income and tax expense to BEA measures of income and taxes. As 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 double counting concerns. In Table 4, 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 BEA *Adj. PTI*. 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 reporting in the BEA data

---

[34] 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.

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 the financial statements and by the BEA, the current E&P activity exceeds both amounts, suggesting that the Form 5471 is double counting some foreign profits.

6.3. Non-U.S. Financial Accounting Data

Bureau Van Dijk (BvD) collects data on activity non-U.S. activity of 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., Huizinga 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, 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. We look forward to future work which studies how variation in BvD data influences estimates of profit shifting.

7. 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 accounting issue and how to correct their data. When we adjust the BEA income measures for equity income, we document estimates of revenue losses that are significantly lower than current estimates. We conclude that many of the existing estimates in the academic literature are significantly overstated and, therefore, should be interpret with caution any conclusions about BEPS countermeasures that rely on BEA data unadjusted for equity income.

The issues addressed in this paper are also salient in other data sources. In particular, we hope that researchers will include some discussion of the double counting and misallocation 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. We look forward to future work that endeavors to reconcile the reporting of economic activity across data sources.
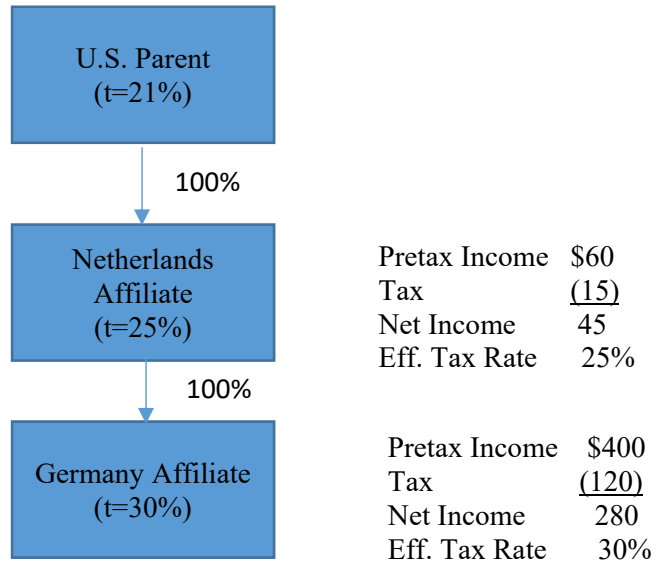
References

Albertus, James. 2019. The Direct Investment Income Puzzle. Carnegie Mellon working paper.

Altshuler, Rosanne and Harry Grubert. 2006. Governments and Multinational Corporations in the Race to the Bottom. *Tax Notes International* (Volume 41 No. 5), pgs. 459-474.

Bach, Stefan. 2013. Has German Business Income Taxation Raised Too Little Revenue Over the Last Decades? Discussion Papers of DIW Berlin 1301.

Beer, Sebastian, Ruud de Mooij and Li Liu. 2019. International Corporate Tax Avoidance: A review of the channels, magnitudes and blind spots. IMF Working paper no. 168.

Bilicka, Katarzyna. 2019. Comparing UK Tax Returns of Foreign Multinational to Matched Domestic Firms. *American Economic Review*, Vol 209 No. 8, p.2921-2953.

Blouin, Jennifer and Linda Krull. 2019. Does Tax Planning Effect Organizational Complexity: Evidence from Check-the-Box. University of Pennsylvania working paper.

Blouin, Jennifer and Leslie Robinson. 2020. Bilateral asymmetries in foreign direct investment statistics: A financial accounting perspective. Working paper.

Borga, Maria and Raymond Mataloni. 2001. Direct Investment Positions for 2000: Country and Industry Detail. Survey of Current Business, July Issue, p. 16-29.

Bolwijn, Richard, Bruno Casella, and Davide Rigo. (2018). "An FDI-driven approach to measure the scale and economic impact of BEPS". *Transnational Corporations* 25 (2).

Bradbury, David, Tibor Hanappi and Anne Moore. 2018. Estimating the fiscal effects of base erosion and profit shifting: data availability and analytic issues. *Transnational Corporations*, Volume 25, Number 2.

Clausing, Kimberly. 2009. Multinational Firm Tax Avoidance and Tax Policy. *National Tax Journal* (Volume 62 Number 4), pgs. 703-725.

Clausing, Kimberly. 2011. The Revenue Effects of Multinational Firm Income Shifting. *Tax Notes* (March 28), pgs. 1580-1586.

Clausing, Kimberly. 2016. The effect of Profit Shifting on the Corporate Tax Base in the United States and Beyond. *National Tax Journal* (Volume 68, Number 4), pgs. 905-934.

Clausing, Kimberly. 2020. Profit Shifting Before and After the Tax Cuts and Jobs Act. Reed College working paper.

Cobham, A., & Janský, P. 2018. Global distribution of revenue loss from corporate tax avoidance: Re- estimation and country results. *Journal of International Development, 30*(2), 206–232. https://doi. org/10.1002/jid.3348.

Crivelli, Ernesto, Ruud de Mooij, and Michael Keen. (2016). "Base erosion, profit shifting and developing countries", *FinanzArchiv: Public Finance Analysis* 72 (3), pp. 268-301.

Damgaard, Jannick, Thomas Elkjaer and Niels Johannesen. 2019. What is Real and What is Not in the Global FDI Network? IMF Working paper 19/274.

De Simone, Lisa. 2016. Does a Common Set of Accounting Standards Affect Tax-Motivated Income Shifting for Multinational Firms? *Journal of Accounting and Economics* 61, p.145-165.

Desai, Mihir, Fritz Foley and James Hines. 2006. The Demand for Tax Haven Operations. *Journal of Public Economics* (Volume 90 No. 3), pgs. 513-531.

Dharmapala, Dhammika. 2014. What Do We Know about Base Erosion and Profit Shifting? A Review of the Empirical Literature. *Fiscal Studies* (Volume 35, Number 4), pgs. 421-448.

Dharmapala, Dhammika and Nadine Riedel. 2013. Earnings Shocks and Tax-Motivated Income-Shifting: Evidence form European Multinationals, *Journal of Public Economics* (Volume 97, Issue C), p. 95-107.

Dischinger, M. and Nadine Riedel. 2011. Corporate taxes and the location of intangible assets within multinational firms. *Journal of Public Economics*, 95(7–8), 691–707.

Dowd, Tim, Paul Landefeld and Anne Moore. 2017. Profit Shifting of U.S. Multinationals. *Journal of Public Economics* (Volume 148), pgs. 1-13.

GAO. 2008. U.S. Multinational Corporations: Effective Tax Rates Are Correlated with Where Income Is Reported. Report to the Committee on Finance, U.S. Senate. Washington DC: United States Government Accountability Office.

Gravelle, Jane. 2015. Tax Havens: International Tax Avoidance and Evasion. CRS Report for Congress. Washington DC: Congressional Research Service.

Guvenen, Faith, Raymond Mataloni, Dylan Rassier, Kim Ruhl. 2019. Offshore Profit Shifting and Domestic Productivity Improvement. NBER Working paper 23324 (revised October 2019).

Heckemeyer, Jost and Michael Overesch. 2013. Multinationals' Profit Response to Tax Differentials: Effect Size and Shifting Channels. *Canadian Journal of Economic*s, vol. 50, issue 4: 965-994.

Hines, James and Eric Rice. 1994. Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics* (Volume 109 No. 1), pgs. 149-182.

Huizinga, H. and L. Laeven. 2008. International Profit Shifting within Multinationals: A Multi-Country Perspective. *Journal of Public Economics*, 92, 1164-1182.

Jansky, Petr and Miroslav Palansky. 2019. Estimating the Scale of Profit Shifting and Tax Revenue Losses Related to Foreign Direct Investment. *International Tax and Public Financ*e, vol. 26: 1048-1103.

Johannesen, N., T. Torslov, L. Wier., 2018. Are less developed countries more exposed to multinational tax avoidance? Method and evidence from micro-data. Working paper.

Lewellen, Katharina and Leslie Robinson. 2014. Internal Ownership Structure of Multinational Firms. Dartmouth College working paper.

Markle, K. 2015. A Comparison of the Tax-Motivated Income Shifting of Multinationals in Territorial and Worldwide Countries. *Contemporary Accounting Research*.

de Mooij, Ruud and Sjef Ederveen. 2008. Corporate Tax Elasticities: A Reader's Guide to Empirical Findings. *Oxford Review of Economic Policy* (Volume 24), pgs. 680-697.

OECD. 2015. *Measuring and Monitoring BEPS: Action 11 Final Report*. Paris: OECD.

Riedel, Nadine. 2018. Quantifying International Tax Avoidance: A Review of Academic Literature, *Review of Economics* (Volume 69 Number 2), pgs. 169-181.

Saez, Emmanel and Gabriel Zucman (2019). The Triumph of Injustice: How the Rich Dodge Taxes and How to Make Them Pay. 1st Edition, W.W. Norton and Company.

Sullivan, Martin. 2004. Data Show U.S. Companies Shifting Profits to Tax Havens. Tax Notes International, September 20, pp 1035 -1046.

Tørsløv, Thomas, Ludvig Wier and Gabriel Zucman. 2020. The Missing Profits of Nations, NBER Working Paper No. 24701.

UNCTAD. (2015). *World Investment Report 2015: Reforming International Investment Governance*. New York and Geneva: United Nations.

Vicard, Vincent. 2015. Profit Shifting through Transfer Pricing: Evidence form French Firm Level Trade Data. Banque de France Working Paper no. 555.

Yorgason, Daniel. 2009. Collection of Data on Income and Other Taxes in Surveys of U.S. Multinational Enterprises. BEA working paper.

Wright, Thomas and Gabriel Zucman. 2018. The Exorbitant Tax Privilege. NBER Working Paper No. 24983.

Zucman, Gabriel. 2014. Taxing across Borders: Tracking Personal Wealth and Corporate Profits, *Journal of Economic Perspectiv*es (Volume 28, Number 4), pgs. 121–148

Zucman, Gabriel. 2015. *The Hidden wealth of nations: The scourge of tax havens.* Chicago: University of Chicago Press.

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

PANEL A: Organization and Activity

	U.S. Parent (t=21%)	

100%

Netherlands Affiliate (t=25%)	Pretax Income	$60
	Tax	(15)
	Net Income	45
	Eff. Tax Rate	25%

100%

Germany Affiliate (t=30%)	Pretax Income	$400
	Tax	(120)
	Net Income	280
	Eff. Tax Rate	30%

PANEL B: Accounting Methods

Consolidation	Equity Method	Cost Method

Consolidation

U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)
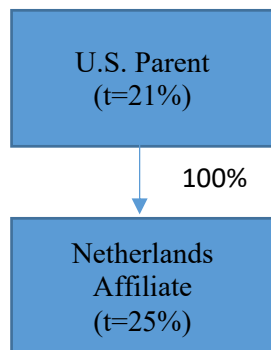
Pretax Income	$460
Tax	(135)
Net Income	325
Eff. Tax Rate	29.3%

Equity Method
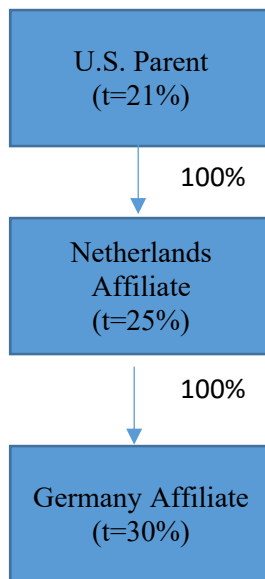
U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)

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

100%

Germany Affiliate (t=30%)

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

Cost Method

U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)
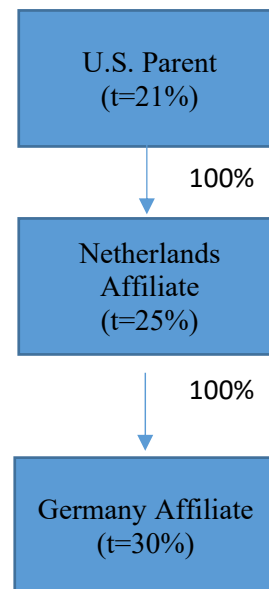
Pretax Income	$ 60
Dividend Income	10
Tax	(15)
Net Income	55
Eff. Tax Rate	21.4%

100%

Germany Affiliate (t=30%)

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

Panel C: BEA measures of Income

Net Income

U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)

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

100%

Germany Affiliate (t=30%)

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

Direct Investment Income

U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)

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

Adjusted Net Income

U.S. Parent (t=21%)

100%

Netherlands Affiliate (t=25%)

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

100%

Germany Affiliate (t=30%)

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

Only the items/amounts in italics are observable in the BEA data. Only *Net income* and *Adjusted net income* are available on an after-tax and a pre-tax basis. *Direct investment income* is only available after-tax.
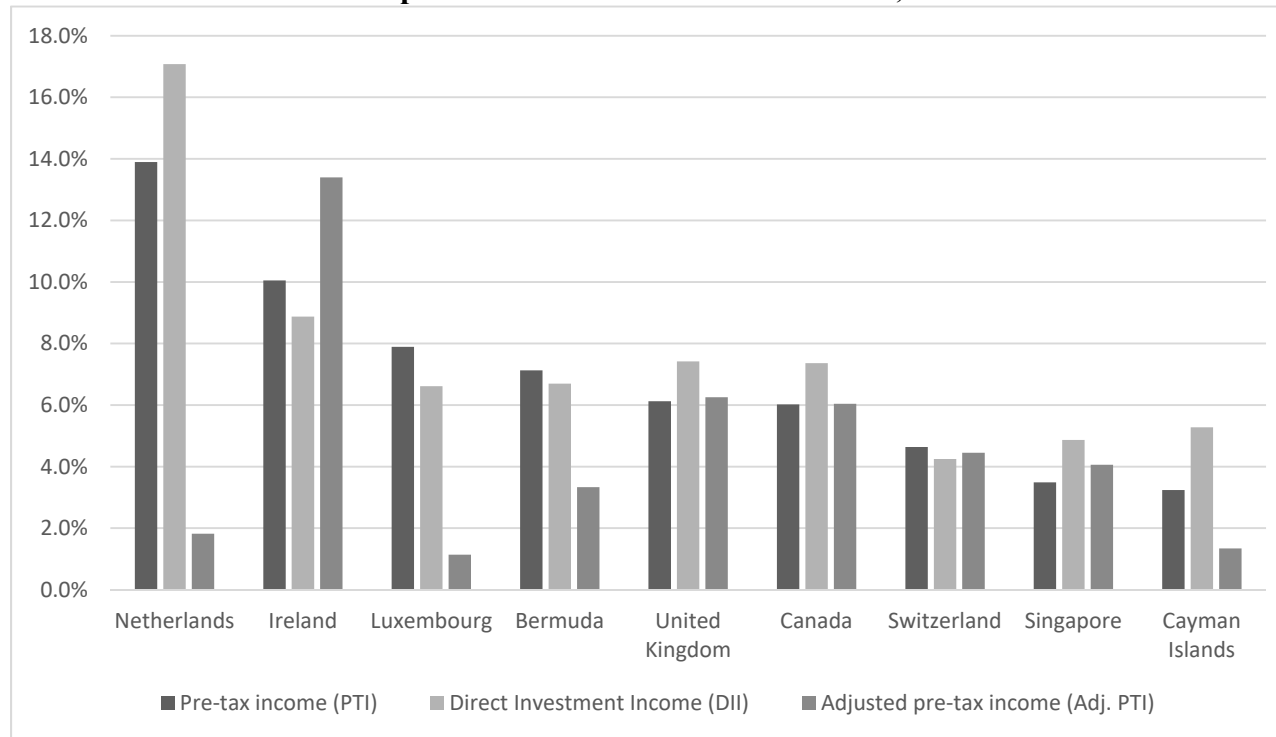
Figure 2
Comparison of BEA Measures of Income, 2012

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
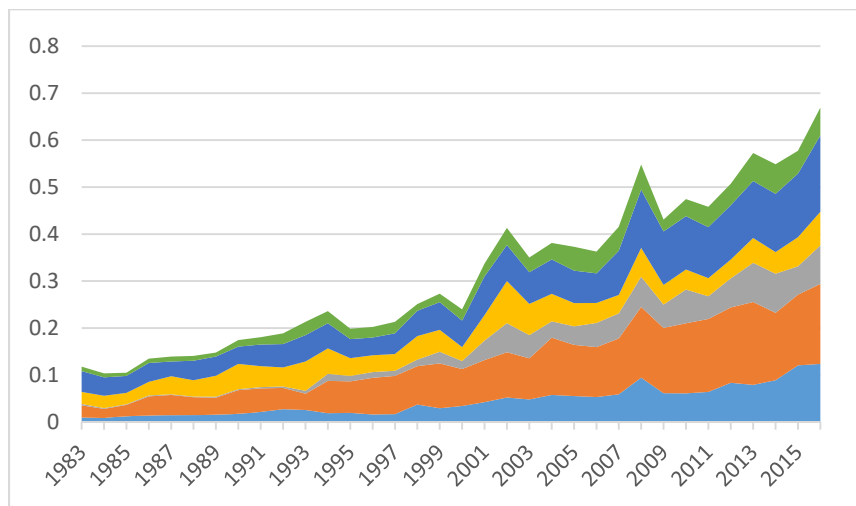
Using Adjusted Pre-tax Income (Adj. PTI)

■ Ireland ■ Netherlands ■ Luxembourg ■ Switzerland ■ Bermuda ■ Singapore

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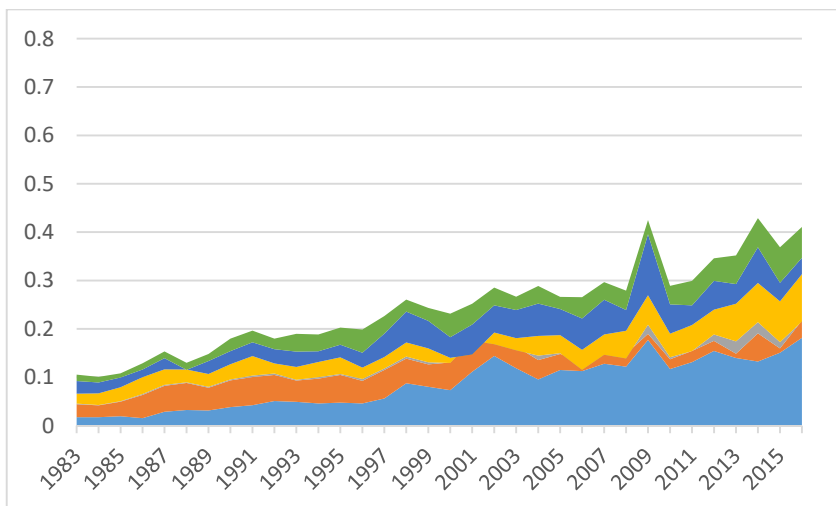
DII is aggregate parents' shares of the net income of directly-owned affiliates as reported in the Balance of Payments data. *Adj. PTI* is aggregate Net Income plus tax expense less equity income as reported in the Activities of U.S. MNEs data.

Figure 4
Share of Aggregate Equity Income of U.S. Foreign Affiliates:
Havens versus Other Countries
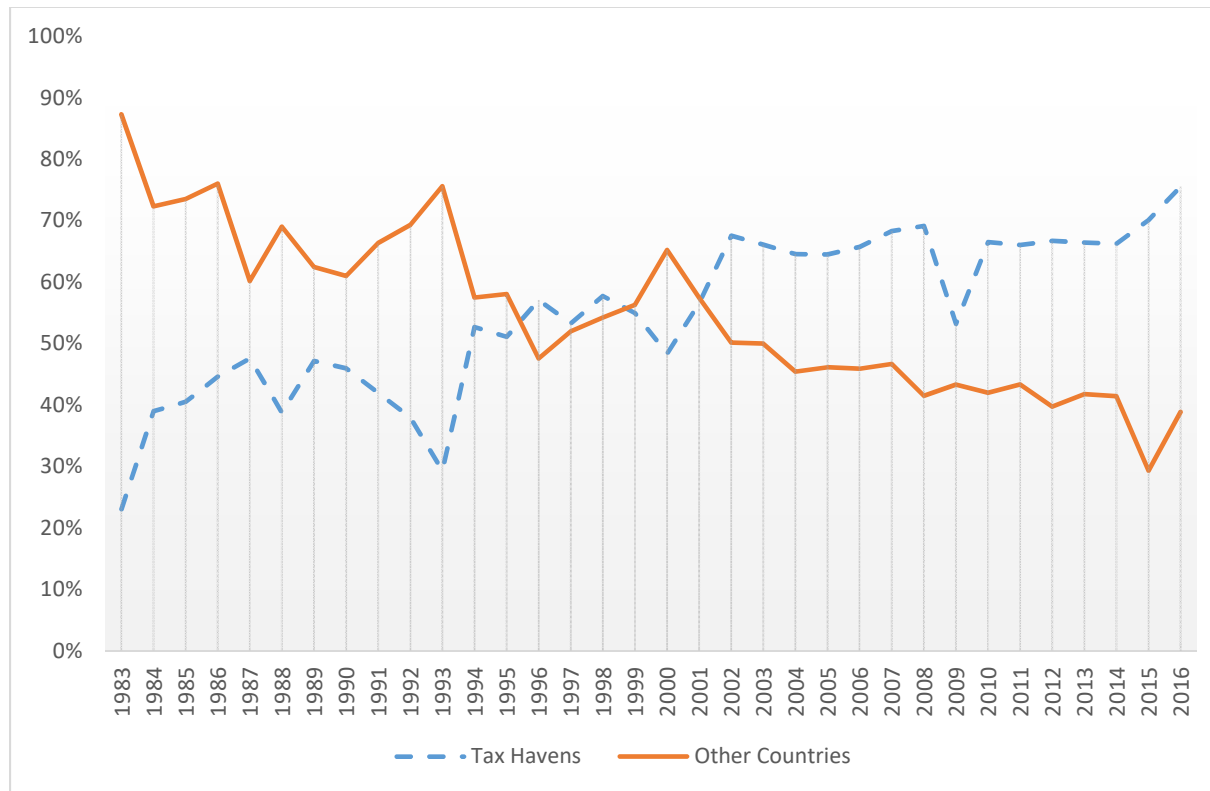
Data source: U.S. majority-owned foreign affiliate data collected by the BEA and included in the activities of MNEs data series:
https://www.bea.gov/international/di1usdop

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

Figure 5
Comparison of BEA's Profit Type Return (PTR) to Adjusted PTI (Adj. PTI)

Panel A

Panel B

Canada — Aggregate Income $mill / % Difference

Netherlands — Aggregate Income $mill / % Difference

Germany — Aggregate Income $mill / Difference %

UK Caribbean — Aggregate Income $mill / % Difference
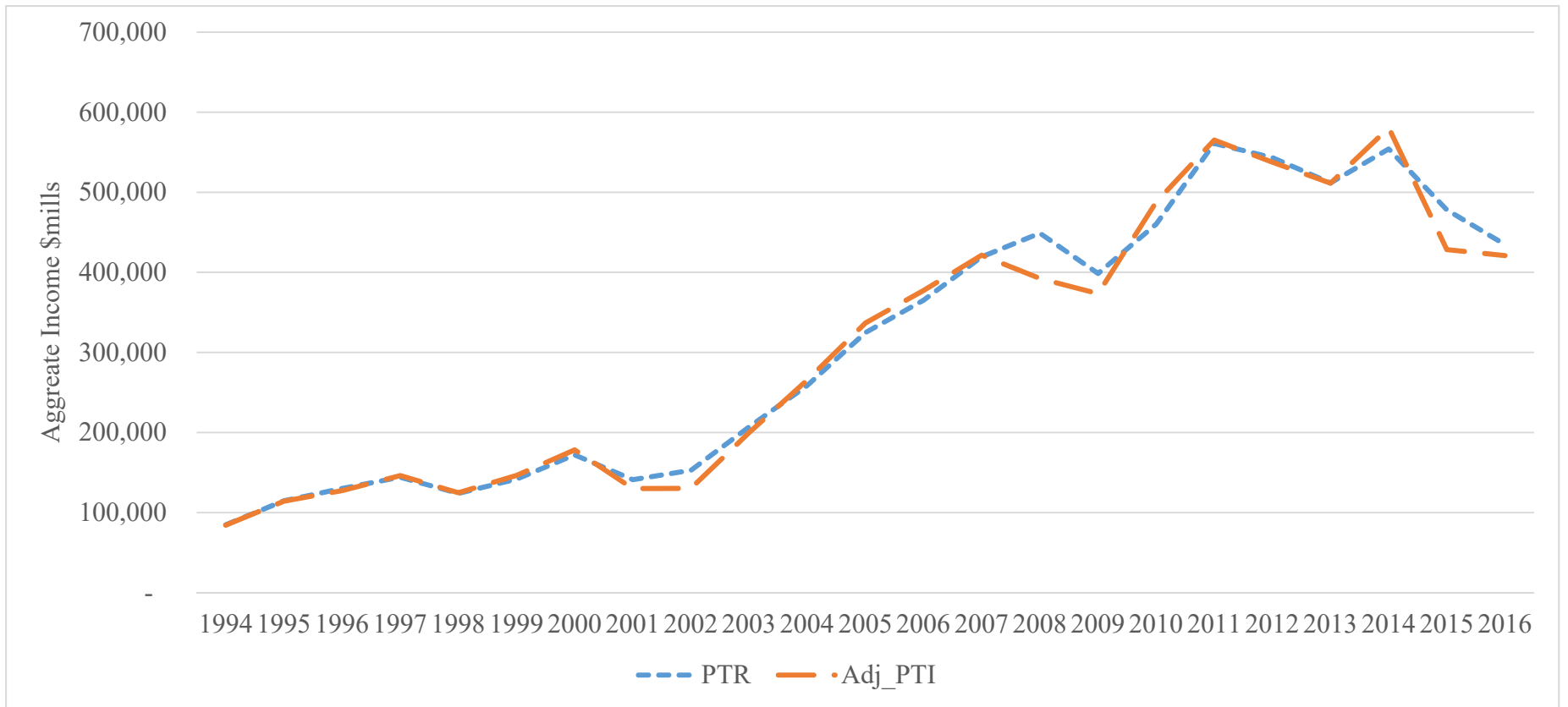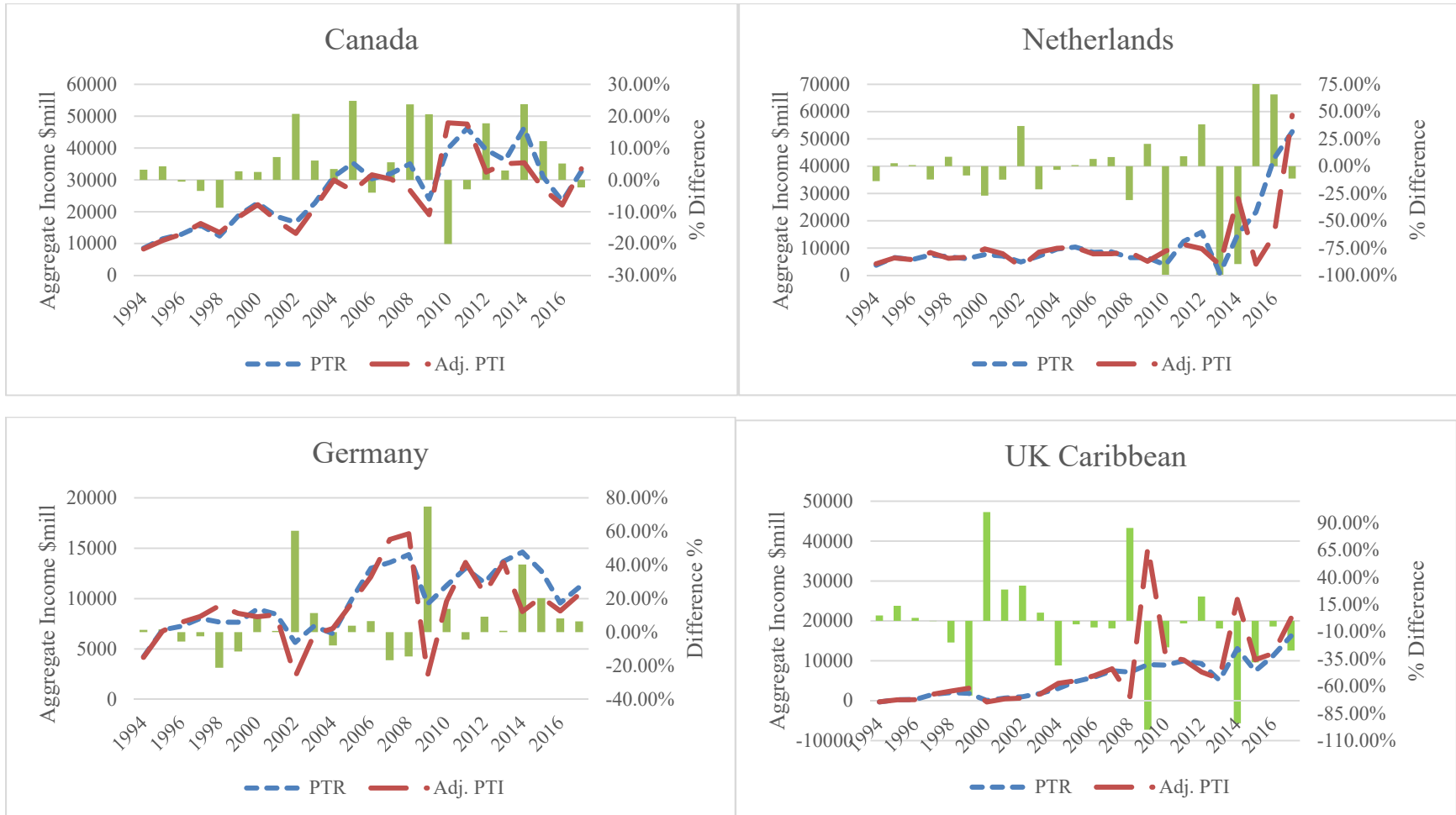
PTR is BEA profit type return. Adj. PTI is NI plus tax expense less equity income. % Difference is the difference between PTR and Adj. PTI over PTR.

Figure 6
Different ownership structures with same economic ownership

Table 1
Adjusted Estimates of Fiscal Effects using Adj. Pre-Tax Income (Adj. PTI), 2012

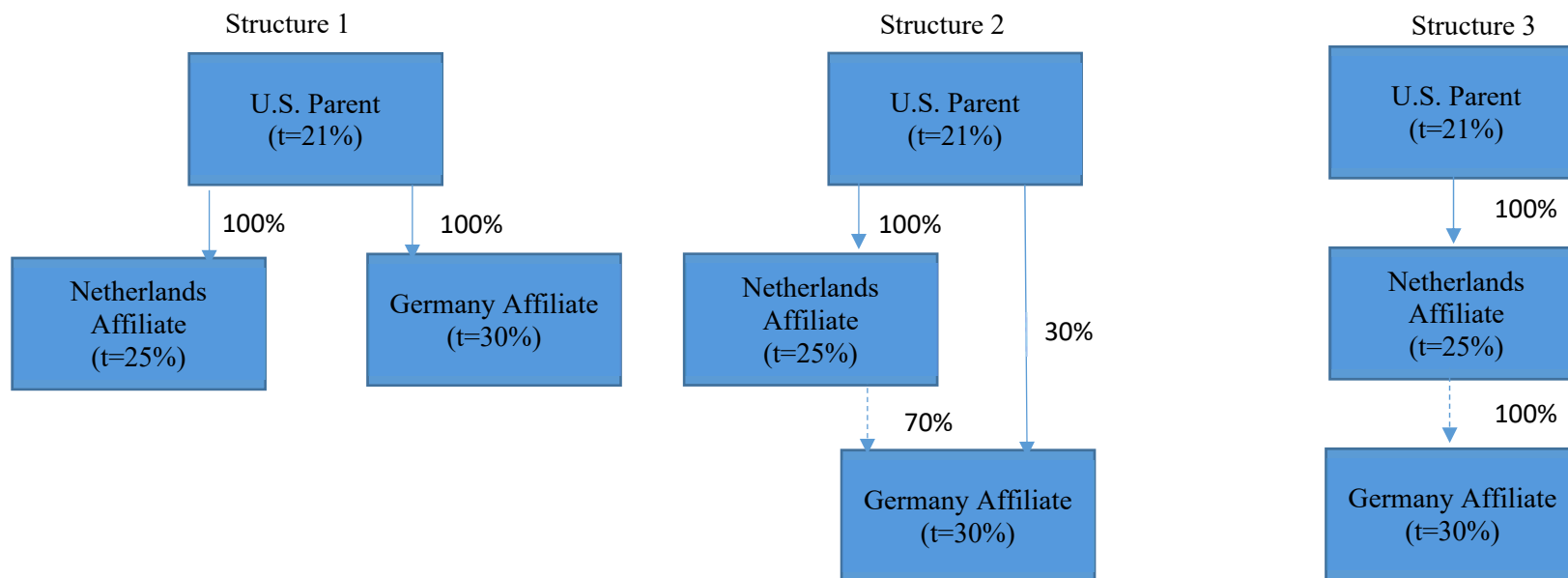| BEA income measure used, revised inputs (i.e., eff. tax rates, elasticity)	Clausing	Blouin and Robinson			
	PTI (1)	Adj. PTI (2)	Adj. PTI, eff. tax rates (3)	Adj. PTI, elasticity (4)	Adj. PTI, eff. tax rates, elasticity (5)
Aggregate income, $Billion	*1,080*	*467*	*467*	*467*	*467*
Change in foreign 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) = Net Income + tax expense (Activities of U.S. MNEs data). Adj. PTI is Net Income + tax expense - equity income.

Table 2
Adjusted Estimates of Fiscal Effects using BEA Direct Investment Income (DII), 2012

	Clausing	Blouin and Robinson
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	**76**	**43**
% of Corporate Tax Revenue	**31.4%**	**17.8%**

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

Table 3
Comparisons of Bureau of Economic Analysis data to Treasury's Statistics of Income data

					Year 2016			
	BEA Reporting-Based Measures			IRS Form 5471			IRS Form 8975	
					Dividends Received from			
	DII	PTI	Adj. PTI	Pre-Tax E&P	Related Parties	Adj. E&P	Pre-Tax Income	
Ireland	52,366	150,688	76,918	202,280	40,018	162,262	31,390	
Luxembourg	34,819	99,812	(943)	86,251	47,018	39,233	(2,139)	
Netherlands	72,130	190,697	15,108	197,133	112,880	84,253	37,642	
Caribbean	26,279	58,885	13,925	45,587	14,304	31,283	26,082	
Bermuda	41,554	75,734	(1,429)	108,415	23,951	84,464	24,900	
Singapore	25,002	42,473	27,077	28,922	5,399	23,523	29,040	
Switzerland	30,321	68,650	41,521	63,021	20,291	42,730	(6,204)	
Amount in all countries	427,542	1,102,464	421,036	1,071,013	365,422	705,591	552,660	
% in Tax Havens	66%	62%	41%	68%	72%	66%	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. Adj. E&P is Pre-tax E&P less related party dividends.

Table 4
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	705,591	105,181

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.

Appendix

In this Appendix, we provide details on our replication and revision of Clausing's estimate of the U.S. fiscal effects of base erosion and profits shifting (BEPS) of MNEs. The purpose of this exercise is not to critique the methodology used in Clausing (2016). There are various empirical strategies used in the profit shifting literature, and indeed even the methodology used by Clausing is changing over time (see, for example, Clausing (2020) that uses our recommended measure of income but changes the method used to estimate profit shifting, and the countries that are included as tax havens). We simply want to show the effect that equity income has on estimates of profit shifting.

A.1 Replicating and revising reported estimates using PTI from Clausing (2016)

To illustrate the implications of failing to understand equity income when measuring BEPS, we revisit the U.S. revenue loss estimates generated in Clausing (2016). Note that this method was used in Clausing (2009,2011,2016) with a new method in Clausing (2020). We do not consider the revised method in Clausing (2020) but focus only on the data quality and interpretation in her published studies. In our view, changing the method and interpretation of the data simultaneously masks the underlying estimation error from previous work.

Clausing's 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

50

profits to determine the change in the foreign tax base attributable to BEPS.[35] We explain how

each of Clausing's inputs is affected by equity income and offer a set of revised estimates.

A.1.1 Foreign affiliate profits

Clausing (2009,2011,2016) do not appropriately capture the magnitude of foreign profits

nor the country in which those profits were earned (and subject to tax). To illustrate, assume that

the example provided in Figure 1 in the paper represents aggregate BEA data for all U.S. MNEs.

The appropriate distribution of foreign affiliate net income (*NI*) is $45 in the Netherlands and $280

in Germany. Now consider that BEA data is reported using the equity method, as shown in Panel

B of Figure 1. Using *NI* including 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 pre-tax *NI*,

referred to in the paper as *PTI*, from the activities of MNEs data that double counts foreign affiliate

profits. These estimates are problematic because, as shown in our example, profits are 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. She attributes this misunderstanding to economists at the BEA

reporting that there is "no simple solution for the double-counting" (Clausing, 2020).[36] Because

Clausing believes it is undesirable to remove all equity income from income measures (see

Clausing, 2011 p. 1581), she presents her estimates using *PTI* as an upper bound and using *DII*

---

[35] 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. See Section A.1 of the Appendix.
[36] The BEA, however, is well aware of the issue and posted instructions to address double counting consistent with our recommendation on their website in 2020 https://www.bea.gov/help/faq/1402.

described in section A.2 of the Appendix) as a lower bound. Yet, with a clear understanding of the equity income, it is obvious that it should never be considered in a profit shifting study.

A.1.2 Foreign effective tax rates

With respect to measuring tax incentives, we again refer to the example in Figure 1 in the paper. The Net income 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 into the debate on the merits of using effective tax rates versus statutory tax rates in studies of BEPS, but to describe how the equity method of accounting affects the estimation of effective tax rates.

Figure 1 Panel A shows that the appropriate foreign effective tax rates are 25% and 30% 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 does not represent income earned in the (foreign affiliate) parent's jurisdiction. Unless it is removed from the denominator, effective tax rates will be systematically low for countries reporting equity income. For example, one would calculate an effective tax rate in the Netherlands as $15/340 = 4.4\%$ when the tax rate should be $15/60 = 25\%$.

So far, one can see that measures of income that include equity income bias in favor of finding evidence of BEPS for two reasons – overstating profits in tax havens and understating effective tax rates. These errors imply 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.

A.1.3 Estimating the semi-elasticity of reported income to tax rates

The primary approach to estimate 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 a function of the affiliate's capital and labor inputs. Shifted income is determined by the tax incentive to move income in or out of the affiliate. In the simplest scenario, this incentive is estimated as the tax rate difference between the parent and the foreign affiliate.[37] 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 A1 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 estimate an average semi-elasticity of -2.72 (close to Clausing's original estimate of -2.92) when the dependent variable is pretax *NI*, which she refers to in her study as 'gross income'.[38]

In Table A1 Panel C, we estimate the semi-elasticity with our measure, *Adj. PTI*, as the dependent variable. Adjusting *PTI* for equity income also changes the effective tax rate measure that we use as an independent variable. When we use *Adj. PTI* to estimate the effective tax rates,

---

[37] 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).

[38] Table A1 Panel B, replicates the analysis, 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 pretax *NI* as the dependent variable.

we obtain an average semi-elasticity across the eight specifications of -1.80, which is nearly one-third lower than Clausing's elasticity.

A.1.4 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 replicate these calculations in Table A2 Panel A, comparing our estimates to hers.

The amount of *PTI* reported in each location in the raw BEA data appears in column 1.[39] 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.

A.1.5 Estimating U.S. fiscal effects

The amount of artificially shifted profits of $626 billion from Table A2 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 A2 Panel B. Recognizing that not all

---

[39] 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.

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 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).[40] 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, Clausing 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.[41] 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.

---

[40] Our ratio is 34% rather than the 39% 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.
[41] Our 60% is very close to the 58.5% in Clausing (2016) which was generated using preliminary data.

A.2 Replicating and revising reported estimates using DII from Clausing (2016)

In each of her papers, Clausing acknowledged that income from the 'Activities of MNEs data' described Section 3.2 of the paper results in 'some form of' double counting. This leads her to offer 'alternate estimates' using direct investment income (*DII*) from the BoP data described in Section 3.3. of the paper, 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 discuss in Section 3.3, *DII* does include equity income and there are several reasons that using this alternative data series does not alleviate the measurement issues we raise.

Most notably, it misreports the location of MNEs' foreign earnings. As shown in Figure 1 Panel C on the paper, using *DII* leads to the incorrect inference that $325 of net income was earned in the Netherlands, and no income was earned 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 tax havne countries with relatively more equity income (see Borga and Mataloni, 2001 and Figure 4).

Moreover, Clausing's work adjusts *DII* in a manner that induces further mismeasurement (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 6, if the U.S. parent only owned 30 percent of the German affiliate with $280 of net income, *DII* 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. If $1 was shifted from the U.S. to Germany, only $0.30 will be observed in *DII*. 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 BEA data series. But Clausing annually contacts BEA staff to get the average direct ownership percent of all U.S. MNEs' foreign affiliates.[42] 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% ((100+30)/2). Since she is provided with only a single percentage and cannot observe which countries have direct ownership, Clausing will gross up the aggregate *DII* from all countries by 65% 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% ((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% so there would be no gross-up and she would use *DII* of $325 ($45 in the 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 will lead to too much income being attributed to foreign jurisdictions.[43]

Overall, there are at least three issues with the gross-up. First, since BEA data doesn't provide any information about whether affiliates that are less than 100% directly owned are owned indirectly by the MNE's domestic parent, grossing up will lead to an overstatement of income in the data series.[44] To illustrate our concerns, we refer to Structure 2 in Figure 6. For Structure 2, a researcher observes that there is $241 of income related to the direct ownership of the Netherlands

---

[42] 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.

[43] 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 6, her gross-up more than reverses the BEA adjustment because the average direct ownership gross-up percentage is always too low.

[44] 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.

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 at least be provided by BEA economist with the

average direct ownership of only directly owned affiliates (which is approximately 95% in 2012).

Ultimately, this gross-up procedure effectively reintroduces the double-counting problem

that the use of *DII* was intended to solve. As reported in Table 2 of the paper, our replication of

Clausing's (2016) fiscal estimate using *DII* grossed-up by average direct ownership of all foreign

affiliates of 57 percent results in an estimated revenue loss of $76 billion, as compared to

Clausing's (2016) $77 billion. When *DII* is not adjusted for indirect ownership, the estimated

revenue loss drops to $43 billion. The Clausing (2016) estimate of the fiscal effects using direct

investment income is only 70% ($77/$111 billion) of her estimate using net income, while ours is

42% ($43/$102 billion).[45] This implies that the alternate estimate she offers is extremely sensitive

to the gross-up procedure.[46]

In summary, 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*.

Using *DII* provides a lower estimate of profit shifting only because aggregate foreign profits are

---

[45] 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.

[46] 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.

lower, but it is still not an appropriate way to measure profit shifting because the distribution of

reported profits depends on the organizational structure of MNEs' foreign affiliates.

Table A1 – 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 A1 – 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 A1 – 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 A2 Panel A
Replication of Clausing (2016) – Estimate of Shifted Profits

Country	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	
	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 A2 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.