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Strategic Movement of Intellectual Property within US Multinational Enterprises

Derrick Jenniges, Raymond Mataloni Jr., Sarah Atkinson, and Erin (Yiran) Xin

6.1 Introduction

The shifting of profits abroad by US multinational enterprises (MNEs) through the movement of intellectual property (IP) has been widely documented. Profit shifting can occur through the use of internal transactions such as licensing agreements and research and development (R&D) cost sharing agreements (CSAs). These arrangements, which can be written to take advantage of ambiguities in tax laws, allow MNEs to legally shift the location of ownership of IP assets within the firm at a reduced price. This activity, also known as transfer pricing, was documented in a Credit Suisse report (Credit Suisse 2015, 35):

> Transfer pricing determines where profits on intercompany transactions are booked for tax purposes . . . By entering into transactions with them-

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> selves . . . , using transfer pricing to price them, a dose of intercompany finance and a few loopholes, companies can move profits to low tax countries and costs to high tax countries.

Although the ultimate effects of the 2017 changes to US tax law remain to be seen, there is reason to believe that the incentives for this behavior have not disappeared. The behavior may continue due to the growing importance of intangibles in the production of goods and services, the difficulty in obtaining comparable market prices for these transactions, and the ability to sell ownership of intangible assets, like any other asset, within the firm.

Business entities that span multiple tax jurisdictions, such as multinational enterprises, present a challenge for tax authorities. To parse these expansive business entities into separate units that fit within the boundaries of tax jurisdictions, tax authorities have adopted the notion of separate accounting. However, as Seidman (2003, p. 541) notes, a business, which is primarily concerned with its overall results, has an incentive to manipulate these separate accounts.

> Group organization of corporations, all owned ultimately by the same stockholders, has been developed by modern businesses for perfectly legitimate reasons, among them being separate accounting for the various parts of an enterprise and the desirability, and frequently the necessity, of creating an independent corporation for the purpose of carrying on a particular part of the business, both at home and abroad. The mere fact that by a legal fiction these are separate entities should not obscure the fact that they are in reality one and the same business, owned by the same individuals, and run as a unit.

Businesses with operations that span multiple tax jurisdictions have an incentive to minimize the profits of their entities located in high-tax jurisdictions and to maximize the profits of their entities located in low-tax jurisdictions. Therefore, to the extent that it is permissible by the tax authorities, or to the extent that the business can avoid detection, the business has an incentive to shift expenses toward entities in high-tax jurisdictions and to shift revenues toward entities in low-tax jurisdictions. To prevent opportunistic behavior, tax authorities have applied the notion of the *arm's length standard*, which requires that intra-firm transactions in goods, services, or assets be priced at a comparable price to what the business would charge to an unrelated party. When businesses fail to adhere to this standard to minimize taxes, the activity is known as *transfer pricing*.

In the United States, concern about transfer pricing between the domestic and foreign units of US multinationals goes back to at least the 1920s. A 1921 report of the House Ways and Means Committee noted that:[1]

1. House of Representatives Report No. 350, 67th cong., 1st Sess., 14(1921).

> Subsidiary corporations, particularly foreign subsidiaries, are sometimes employed to "milk" the parent corporation, or otherwise improperly manipulate the financial accounts of the parent company.

In 1928, Congress established Section 45 of the tax code to provide guidelines on transfer pricing within US MNEs. These laws held for decades, but the post–World War II expansion of US multinationals into Europe in the 1950s and 1960s created renewed interest in the topic, and in 1968, US transfer pricing law was updated under Section 482 of the US tax code. Picciotto (1992, p. 186) maintains that the 1968 guidelines "provided the basis for the monitoring of transfer pricing by the US Internal Revenue Service (IRS) for two decades without substantial changes." In the mid-2000s, an abrupt slowdown in the growth of corporate profits brought renewed scrutiny to transfer pricing practices. In 2006 congressional testimony, the commissioner of the US IRS stated that:

> Taxpayers shift significant profits offshore by manipulating the price of related party transactions so that the income of an economic group is earned in low-tax or no-tax jurisdictions, rather than the U.S., thus reducing the enterprise's worldwide tax liability . . . The levels of aggressiveness vary from one taxpayer to another . . . high technology and pharmaceutical industries are shifting profits offshore through a variety of intangibles to related foreign entities for inadequate consideration. Cost sharing arrangements are often the method of choice for this activity.[2]

Concerns over tax base erosion have led the US government to investigate this behavior. In 2012, the US Senate Permanent Subcommittee on Investigations questioned Microsoft's use of an intra-firm CSA, suggesting that aggressive transfer pricing was used to shift its IP assets from the US headquarters to subsidiaries in Puerto Rico, Ireland, and Singapore in an effort to avoid or reduce its US taxes (US Congress Senate Committee on Homeland Security and Governmental Affairs 2012). According to the Senate testimony, the majority of Microsoft's R&D was conducted in the United States. However, using a CSA, Microsoft Singapore and Microsoft Ireland reimbursed its US parent for some R&D costs in exchange for the right to collect royalties on the resulting IP in certain geographic markets. The Senate testimony indicates that Microsoft Singapore and Microsoft Ireland then marked up and relicensed these IP assets to other subsidiaries, paying 2.74 percent and 5.76 percent effective tax rates, respectively, to their host governments on income earned in 2011; these tax rates are significantly lower than the statutory US corporate tax rate of 35 percent, which prevailed at the time. Similarly, in 2013 the US Senate subcommittee concluded that

2. Mark Everson testimony to Senate Committee on Homeland Security and Governmental Affairs Permanent Subcommittee on Investigations hearing on Offshore Abuses: The Enablers, the Tools, and Offshore Secrecy, August 1, 2006. Quotation from page 17 of Sikka and Willmott (2010).

Apple used a CSA, a variety of offshore structures, and favorable transfer pricing to shift billions of dollars of profits to Ireland from the United States (US Congress Senate Committee on Homeland Security and Governmental Affairs, 2013). The subcommittee found that over the period of 2009–2011, Apple Sales International (ASI), the subsidiary that holds most of Apple's IP abroad, earned $38 billion in profits but paid only $21 million in taxes for an effective tax rate of 0.06 percent.

In this study, we explore profit shifting behavior of US MNEs through the use of CSAs. We expect that having a CSA is associated with lower profits for the US parent and higher profits for its foreign affiliates. We test this hypothesis on a sample of R&D-intensive MNEs over the 2006–2015 period and find support for our hypothesis. Specifically, foreign affiliates of parents with CSAs tend to be more profitable relative to their US parent compared with affiliates of parents without CSAs. Our study also offers an explanation for the small amount of research on this topic. It is very difficult to find public information identifying US MNEs with CSAs, and efforts by the US government to collect and publish this information have not been successful.

6.2 Literature review

Most of the academic studies of transfer pricing by US multinationals offer indirect evidence of strategic transfer pricing. In a seminal study, Grubert and Mutti (1991) use tabular data from the 1982 Benchmark Survey of US Direct Investment Abroad to show that the profitability of foreign manufacturing affiliates of US multinational enterprises is negatively related to the host country statutory tax rate, even after controlling for other economic factors in the host country. The authors also find a higher propensity for the US parent to export to their manufacturing affiliates in low tax countries, suggesting that at least part of the transfer pricing activity occurs by manipulating the prices for intra-firm trade in goods. In Grubert and Mutti (2009), the authors turn their attention to intra-firm pricing of IP. The paper is motivated by anecdotal cases of US multinational enterprises that have moved valuable IP created in the United States to entities in low tax countries. The authors focus on the specific tax management strategy of CSAs. Riedel (2014, p. 15) maintains that studies such as this one that focus on a specific strategy provide the strongest evidence of transfer pricing.

The most convincing empirical evidence has been presented by academic studies that investigate specific profit shifting channels, as their empirical tests are more direct and offer less room for results being driven by mechanisms unrelated to income shifting.

Under CSAs, a unit in a low tax country shares in the cost of developing IP through R&D in return for the right to earn royalties on those assets in certain geographic areas (typically in all non-US markets). Using tabular data on foreign affiliates of US MNEs from the US IRS and from the US

Bureau of Economic Analysis (BEA), Grubert and Mutti find that evidence of rising payments by affiliates to their US parents under CSAs is associated with a reduction in royalty payments by affiliates to their parents, which is consistent with a rise in transfer pricing under CSAs by US MNEs. In a related study, Bridgman (2014) shows how strategic movement of IP assets affects the location of profits of US MNEs by demonstrating how excluding intangible assets from the calculation of foreign direct investment (FDI) returns impacts US returns from the rest of the world compared with domestic returns.

In addition to these studies, a few studies employ firm-by-transaction-level data to provide direct evidence of transfer pricing. Bernard, Jensen, and Schott (2006) examine export transactions of US-based firms at the 10-digit Harmonized System level over the period 1993–2000. They find that when host country statutory tax rates are low, US multinationals tend to charge related parties lower prices than they charge unrelated parties for the same goods, which is consistent with tax-motivated profit shifting behavior. Other papers examining European multinationals employ a similar method and find similar results for Danish and French multinationals (Cristea and Nguyen 2013; Vicard 2015). This chapter is the first effort, to our knowledge, to employ firm-level data to examine profit shifting through the pricing of intangible assets under a specific tax strategy.

6.3 Challenges of Measuring IP Asset Movement within MNEs

6.3.1 Definition of IP Assets

The 2008 System of National Accounts (SNA) defines five types of IP assets: R&D; mineral exploration and evaluation; computer software and databases; entertainment, literary, and artistic originals; and other IP assets. The ownership of IP assets can be retained, in whole or in part, by the developer of these assets or transferred between entities within an MNE. Transferring the ownership of these rights occurs either through selling the rights outright or leasing them, and is governed by licensing agreements. US tax law on transfers of IP within an MNE are based on the arm's length standard, which requires that the price paid for the IP asset be commensurate with the expected income flows from that asset. Receipts and payments for the use of IP assets between US MNEs and foreign entities are recorded by BEA in the US International Transactions Accounts (ITAs) as exports and imports of services.

6.3.2 IP Assets Have an Important Role in US Trade in Services

IP assets play an important role in US trade in services, especially within MNEs. In 2016, US exports of services were $752.4 billion, up from $271.3 billion in 1999. Of this amount in 2016, $124.5 billion (17 percent) was

accounted for by charges for the use of IP (sometimes referred to as licensing). Moreover, $69.4 billion (56 percent) of these exports occurred within US MNEs; that is, trade between US parents and their foreign affiliates. Charges for the use of IP are a return to the final output generated by R&D and other innovative activities. Firms also receive payments to fund in-process R&D on behalf of others, including affiliated customers. These charges are recorded under R&D services. In 2016, the United States had exports of R&D services of $37.2 billion, of which $20.6 billion (55 percent) occurred within US MNEs.

6.3.3 Movement of IP Assets within MNEs and Its Effects on Measures of Production

For tax purposes, and for economic accounting purposes, an IP asset is taxed based on the geographic location of its owner. This convention creates an incentive for MNEs to transfer ownership of IP that has been generated in their home country to affiliates in countries with lower tax rates at a price less than an arm's length price to reduce global income taxes. When successful, this practice can lead to large discrepancies between the location of productive economic activity generated through the use of IP assets and the location of legal ownership of these same IP assets. Under the SNA guidelines, many economic statistics, including stocks of IP assets, should be collected and presented based on the concept of economic ownership. Economic ownership is said to accrue to the entity that bears the risks and reaps the rewards of using the IP. As a practical convenience, economic ownership is often ascribed to the legal owner or paying user of the IP and is therefore attributed to that entity's place of legal incorporation or registration. In MNEs, legal and economic ownership of IP assets is sometimes transferred between units at less-than-arm's-length prices. This strategic movement of IP causes official economic statistics to not fully represent where the economic benefits of production associated with the IP are realized. The incidence of creating IP assets in a higher tax country and transferring ownership of them to a related entity in a lower tax countries at an artificially reduced price leads to increased exports of services and higher gross domestic product (GDP) estimates in low tax countries, and reduced exports of services and lower GDP estimates in higher tax countries.

6.4 CSAs

6.4.1 Description of CSAs

CSAs are defined under Section 482 of the US tax code regulations as an agreement under which the parties agree to share the costs of developing one or more intangibles in proportion to the share of reasonably anticipated benefits from exploiting the intangibles assigned to them under the arrange-

ment. By sharing in the costs, the parties agree to share in the associated revenue if the outcome of the R&D has value. The most common method for assigning the division of revenue is based on territory (Bose 2002, 10), often with the US parent retaining rights to earn income from sales in the United States and the affiliate receiving rights to earn income from sales to the rest of the world. CSAs do not involve a full transfer of ownership. Instead, through joint funding of the development of these assets, the firms jointly share in the ownership of these assets. Under the agreements, each party is assigned a portion of the worldwide territory in which it can sell goods or services produced using these IP assets and/or to which they can license these IP assets to other affiliates and third parties. Each party separately earns income from sales to affiliates and to third parties.

6.4.2 Impacts of CSAs on Official Statistics

Transfer pricing through receipts under a CSA by US parents from foreign affiliates in low tax regions will impact the National Income and Product Accounts (NIPAs), as well as the trade in services and the primary income components of the current account of the US International Transactions Accounts (ITAs). These impacts will carry through to key economic aggregates, including GDP. Specifically, these impacts will affect the value of exports of services from the parent to the affiliate. Cross-border payments by foreign affiliates to US parents under CSAs are recorded as R&D services exports in the ITAs and the NIPAs. If the parent charges the affiliate less than the true costs of developing the IP asset, the parent's exports of R&D services and the affiliate's imports of R&D services will be understated. If the affiliate earns revenue from the IP abroad commensurate with the true value of these underlying assets, then its earnings will be increased by the transfer pricing. This will lead to an undervaluation of US GDP and an overvaluation of GDP in the affiliate's country (United Nations 2011, 113).

The US parent's share of the income earned by the foreign affiliate from the sale of goods or services embodying these IP assets is recorded in the ITAs under direct investment income. Because the undervaluation of the IP assets provided to the affiliate lowers the affiliate's costs, the parent's direct investment income receipts are increased. Assuming that the affiliate is fully owned by the parent, the effects of the parent's reduced exports of R&D services are effectively offset by increased direct investment income, so that the current account of the ITAs and GNP, which both take into account the trade in R&D services and investment income, are not affected. However, the GDP of the host country of the affiliate is raised by the earnings on the IP assets.

6.4.3 Example of a CSA and Its Impacts on National Statistics

The following hypothetical example details the sequence of events when a multinational enterprise utilizes a CSA. *The effects of the CSA on official statistics are indented and shown in italics.*

1. Suppose a US parent invests $100 million in R&D costs for a new product that will be sold both domestically and internationally.

2. The US parent enters into an intercompany CSA with its Irish affiliate. The two parties agree that the US parent retains the rights to sell the product in the United States (domestic sales) and the Irish affiliate obtains the rights to sell the product in all other countries.

3. Under the agreement, domestic sales are expected to be one-fourth of all total worldwide sales, implying the Irish affiliate will pay three-fourths of the R&D costs, or $75 million.

- *The $75 million payment to the US parent would be recorded as US exports of $75 million in R&D services to Ireland.*

4. Suppose that the product is developed successfully and generates $1 billion in worldwide revenues. Also suppose that the US parent earns $200 million in revenues in the domestic market and the Irish affiliate earns $800 million in revenues from sales to the rest of the world.

- *US FDI income receipts are $800 million, assuming, for simplicity, that the Irish affiliate's costs are zero.*
- *US exports of R&D services are zero.*
- *US exports of charges for the use of IP are zero.*
- *Had the parent not engaged in a CSA with its Irish affiliate and had retained all rights, US exports of charges for the use of IP would have been $1 billion.*

6.4.4 Methods Explored but Not Used to Identify MNEs with CSAs

Information on CSA activity is collected by the IRS, but firm-level information is not publicly available. Under Subsection 26 of Section 482 of the US tax code governing CSAs, taxpayers participating in a qualified CSA must attach to their US tax returns (or to a Schedule M of forms 5471 or 5472 for firms that pay foreign taxes) a statement indicating that they participate in a qualified cost-sharing arrangement. They must also provide names and information of the other participants, the method to determine the share of each participant's intangible development costs, any prior research and buy-in payments, and any allocations for stock-based compensation for plans filed after 2003. We ultimately hope to obtain access to this information to improve the data underlying our study, but we were not able to make these arrangements in time to incorporate the data into this chapter. Obtaining these records would allow us to construct an accurate and precise measure of firms with CSAs for each year. It would also improve on our current measure of CSAs by providing affiliate and country-level detail.

Some relevant firm-level information is provided by US Patent and Trademark Office (USPTO) records. However, it is difficult to link patent data to specific US MNEs, and it is even more difficult to match foreign patent data with foreign affiliates of US MNEs. Patent data provide information only on the patent titleholder and generally not on other participants, and the data

are often not updated to reflect the transfer of IP assets to different entities within the MNEs. Because of these difficulties, in January 2014, the USPTO proposed updating its rules "to facilitate the examination of patent applications and to provide greater transparency concerning the ownership of patent applications and patents."[3] However, based on the public comments it received, the USPTO decided not to implement this proposal.[4]

We also explored using micro-data collected on BEA's benchmark (BE-120) and quarterly (BE-125) surveys of transactions in selected services and IP with foreign persons (henceforth, services surveys). US firms engaging in CSAs with foreign persons, including foreign affiliates, are required by law to report exports of R&D services on these surveys. One difficulty of using this information is that the surveys do not separately identify transactions related to CSAs. When possible, we linked the micro-data from these surveys to BEA's Activities of Multinational Enterprises (AMNEs) surveys, the BE-10 benchmark and BE-11 annual surveys, but differences in reporter names, coverage, and reporting thresholds on the services and AMNE surveys limited this approach.[5]

6.4.5 Method Used to Identify US MNEs with a CSA

We identify US MNEs with CSAs based on information in Securities and Exchange Commission (SEC) 10-K filings. We linked the firm-level BEA data on US MNEs to the firm-level corporate 10-K records using clerical name matching. We found evidence of intra-firm CSAs by conducting text searches of the 10-Ks. We limit our analysis to R&D-intensive US MNEs because of the resource-intensive nature of the exercise and because these firms are more likely to create and transfer valuable IP assets to foreign affiliates. We define R&D-intensive US MNEs as those having domestic R&D expenditures to sales ratios greater than or equal to 10 percent. To help avoid arbitrary exclusions, any US MNE meeting this criterion in any of four selected years (2006, 2009, 2012, or 2015) was included in our study. Applying this definition resulted in a list of 237 R&D-intensive US MNEs from BEA's AMNE surveys.

The text searches of 10-K filings were done primarily using the SEC Edgar online search engine. Using a keyword search for "cost sharing" or

3. Changes To Require Identification of Attributable Owner, Volume 79, No. 16, *Federal Register* (January 24, 2014).

4. https://www.uspto.gov/patent/initiatives/attributable-ownership.

5. Reporters to the BE-120 services survey data used in this study, covering 2006 and 2011, were required to report receipts from (sales to) affiliated or unaffiliated foreign persons of a particular type of service or IP greater than $2 million by country and by type of service. For the BE-125 services survey data used in this study, covering the other years, the cutoffs were $6 million for receipts and $4 million for payments, respectively. For the BE-10 benchmark AMNE survey data used in this study, covering 2009 and 2014, affiliates with assets, sales, or net income (±) of at least $80 million were required to report all of the data items used in this study. For the BE-11 annual AMNE survey data used in this study, covering the other years, the cutoff was $150 million for 2006–2008 and $60 million for 2010–2013 and 2015.

"cost-sharing," we looked for evidence that the company had an intra-firm CSA in place. This search was done by company and by year for the period 2006–2015. Using the Edgar search engine, we also attempted to search for intra-company CSA references by firm across all documents filed with the SEC. However, the option to search across all documents for a given year in Edgar is limited to filings during the past four years. Expanding our search in this way resulted in the identification of only a few additional CSAs, and their inclusion did not have a significant impact on our analysis. In addition to the Edgar search engine, we searched for CSA references within company filings and other documents using the commercial SEC document search engine BamSEC. This commercial search platform allowed us to search for CSA references across all SEC filings, news releases, and transcripts of earnings calls for a given US MNE. As with the comprehensive Edgar text search, utilizing this commercial search engine identified only a small number of additional US MNEs with CSA references, and their inclusion did not have a significant impact on our results. Nevertheless, comparing our results across these different methods gave us confidence that the main strategy of focusing on 10-K reports was robust and that the 10-K reports provide a systematic and reliable way to identify most of the large firms with intra-firm CSAs.

There are limitations to the 10-K search approach. Only US MNEs listed on a US stock exchange are required to file 10-Ks. As a result, we excluded from our analysis firms that did not file a 10-K record. Most importantly, the 10-K reports do not indicate the years in which the firm participated in a CSA or the level of CSA payments. Timing is important because during the time in which an affiliate is making its cost sharing installment payments to its US parent, its profits will be depressed. After it has completed those payments, its profits will be boosted by the favorable return on investment from those assets. The 10-K reports also do not necessarily indicate the country of the affiliate with whom the parent company enters into a CSA.[6] Additionally, the absence of country information requires that the CSA variable used in the regression analysis be applied at the parent level and to all affiliates of the given parent, whereas in reality, innovation and cost sharing activity is usually concentrated among a few affiliates (Bilir and Morales 2016) and in one or two specific countries. We partly overcome this limitation by employing country fixed effects in our regression analysis.

We linked our list of MNEs engaging in CSAs with profits and other

6. While supplementing our search using the Edgar SEC database with commercially available databases, such as BamSEC and Bloomberg, can provide additional firm-level information on CSAs, these databases do not solve the root issues with using 10-K reports to identify firms with CSAs. These include the danger of false negatives. That is, just because we do not find a CSA reference is not a complete guarantee that the company does not have a CSA. In addition, the information in these datasets is generally based on corporate 10-K information collected by the SEC so the dataset is restricted to listed firms. Moreover, it may also be biased toward firms that have been listed for a longer time and, as a result, filed more documents with the SEC, and larger MNEs, which are likely to have filed more detailed financial documents with the SEC.

Table 6.1 **R&D-intensive[a] US MNEs by CSA reference, 2006–2015**

Cost sharing reference	Number of US parents	Percent of total
Yes	42	18%
No and listed[b]	152	64%
No and private or not listed	43	18%
Total	237	100%

[a] R&D intensive = R&D expenditures-to-sales ratio >= 10 percent in any of the following years: 2006, 2009, 2012, or 2015.

[b] Listed means the corporation was listed on a US stock exchange and filed a 10-K in at least one of the years in the sample period.

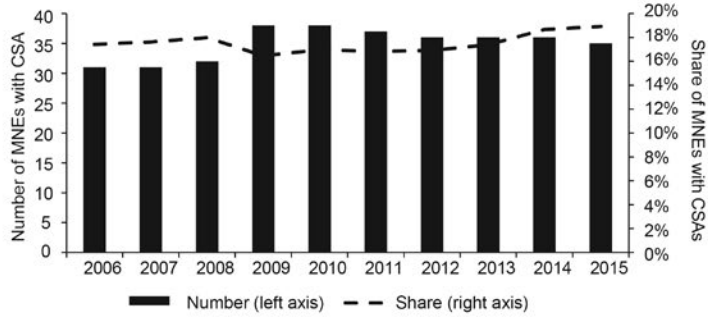

Figure 6.1 **Number and share of US MNEs having a CSA reference, 2006–2015**

data from BEA's AMNE surveys and with data on the level of cost sharing payments, as indicated by R&D services exports from parents to affiliates reported on BEA's services surveys.

6.4.6 Characteristics of US MNEs with CSAs

From our list of 237 R&D-intensive US MNEs reporting on the AMNE surveys, we identified 42 as having an intra-firm CSA at some time during our period of study, 2006–2015. The remaining MNEs without a CSA reference were split into public corporations that filed a 10-K during the 2006–2015 sample period (152 MNEs) and private and other corporations that did not file a 10-K during the same period (43 MNEs). These results are summarized in table 6.1 and figure 6.1.

US MNEs with CSAs are concentrated in a few key industry sectors. The majority of US MNEs with CSAs are classified in the following North American Industry Classification System (NAICS) industry sectors: metals and machinery manufacturing, excluding chemicals (NAICS sector 33); information (NAICS sector 51); and professional, scientific, and technical services (NAICS sector 54). Figure 6.2 presents counts of MNEs in the four-digit NAICS industries in these industry sectors, for all MNEs and for those

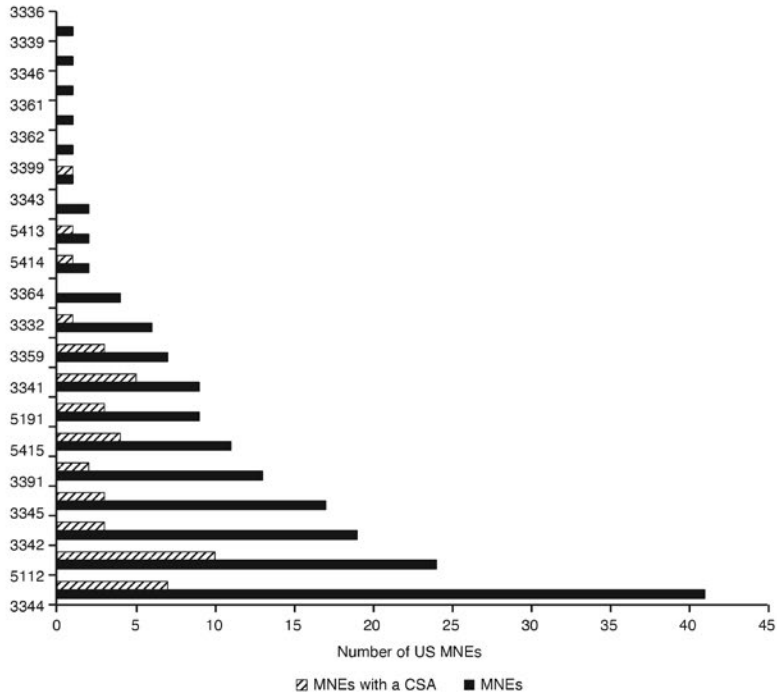

Figure 6.2 **R&D**-intensive US MNEs by industry of US parent, 2006–2015
Note: A description of the NAICS codes is provided in appendix A.

having a CSA. These industry sectors could be considered "high-tech" and R&D intensive. Firms within the information and professional, scientific, and technical services industry sectors tend to have a relatively large portion of their total assets in intangible capital. Previous research (such as Grubert 2012) has found stronger links between parents in high-tech industries, the establishment of subsidiaries in low tax countries, and the movement of IP for profit shifting activities.

6.5 Model, Data, and Empirical Results

6.5.1 Methodology and Model

Our model is motivated by a basic return on assets framework for parents and affiliates, which measures the profitability of an operating unit within an MNE as generated by its stock of tangible and intangible assets. Denoting *i* as the operating unit (US parent or foreign affiliate), the rate of return is given by profit-type return (PTR) scaled by a firm's stock of assets, which

consists of physical assets, such as building structures, land, and equipment, as well as intangible assets, such as IP.[7]

$$Rate\ of\ Return_i = \frac{\mathrm{PTR}_i}{Physical\ assets_i + Intangible\ assets_i}$$

A unit's profitability is a function of its physical asset stock and its intangible asset stock, which can be either created in house or purchased. We use the value of net property, plant, and equipment as the measure of the stock of physical assets. As a measure of the stock of intangible assets, we utilize data on R&D performed by the unit for its own use, R&D services payments and receipts, and affiliated IP royalty payments. The R&D stock is calculated using the perpetual inventory method where the flows equal R&D performed for own account, minus R&D services exports, plus R&D services imports. In the model, we also include affiliated royalty payments, since they represent compensation for shared R&D assets within an MNE; royalty payments represent period-specific leasing of R&D assets rather than an accumulation of R&D assets over time, so they are simply added to the denominator rather than being included in the perpetual inventory calculation. This approach acknowledges that the stock of intangible assets within a unit of an MNE may be either created in house or purchased from outside. Both intangible and tangible assets are expected to generate a return for the unit, resulting in the following profit equation for US parents:

$$\begin{aligned}(1)\qquad \mathrm{PTR}_{\mathrm{USP},t} = {} & \beta_0 + \beta_1 \mathrm{PPE}_{USP,t} + \beta_2 R\&D\ Stock_{\mathrm{USP},t} \\ & + \beta_3 Royalty\ Payments_{\mathrm{USP},t} + \beta_4 Cost\ Sharing_{\mathrm{USP},t} \\ & + \varepsilon_{\mathrm{USP},t}.\end{aligned}$$

The inclusion of the parent PPE accounts for firm size, and we limit the analysis to R&D-intensive parents. Equation 1, which is estimated with panel data for US parents (USP), is also estimated with industry fixed effects.

Conceptually one might imagine a similar equation for individual foreign affiliates because, just like US parents, both their tangible and intangible assets are expected to generate a return. However, two data limitations prevent the estimation of such an equation for affiliates. First, our data do not identify specific foreign affiliates with which US parents had CSAs. As a result, the binary variable denoting a CSA is a firm-level variable. The second limitation is that the services surveys (the surveys that collect data for royalty payments and R&D exports and imports) are collected only at the country

7. Profit-type return is BEA's measure of profits from current production based on its AMNE surveys. It is derived from financial accounting data and is calculated as net income before taxes minus capital gains and losses, depletion, and income from equity investment. For details, see the technical note to Mataloni and Goldberg (1994).

level, not at the foreign affiliate level, which becomes an issue when an MNE has more than one foreign affiliate in a particular country.

As a result of these data limitations, we aggregate foreign affiliate data to the country of the affiliate and construct an equation that compares the profitability of the parent and the country-aggregated foreign affiliate units of a US MNE to uncover evidence that is consistent with US parents shifting profits abroad through the use of CSAs. We begin with an equation similar to equation 1 except instead of variables representing the data for US parents, they represent the sum of that data item for all affiliates of a given parent in a given country:

$$(2) \qquad \mathrm{PTR}_{C,t} = \beta_0 + \beta_1 PPE_{C,t} + \beta_2 R\&D\ Stock_{C,t} + \beta_3 Royalty\ Payments_{C,t} + \beta_4 Tax\ rate_C + \varepsilon_{C,t}.$$

We add a variable denoting the median effective tax rate faced by affiliates in a country in 2006–2015. Then, we subtract equation (1) from equation (2) to examine the difference in the profitability of affiliates and parents. The resulting equation is given by:

$$(3)\ (\mathrm{PTR}_C - \mathrm{PTR}_{\mathrm{USP}})_t = \alpha_0 + \alpha_1(\mathrm{PPE}_C - \mathrm{PPE}_{\mathrm{USP}})_t + \alpha_2(R\&D\ Stock_C - R\&D\ Stock_{\mathrm{USP}})_t + \alpha_3(Royalty\ Payments_C - Royalty\ Payments_{\mathrm{USP}})_t + \alpha_4 \mathrm{Cost\ Sharing}_{\mathrm{USP},t} + \alpha_5 Tax\ Rate_C + \eta_t.$$

In equation 3, variables with the subscript *C* denote the sum of the data for all foreign affiliates of a particular MNE in a particular country. For example, if a US parent has three affiliates in Belgium, then the R&D stock for each of these three affiliates would be aggregated into a single R&D stock in Belgium for that US parent. The tax rate variable captures the effect of host country tax rates. Following similar studies of profit shifting by MNEs, we explored different tax rate variable specifications. First, we explored using the inverse of the tax rate, which would acknowledge that the impact of a change in tax rates on profits may be larger for affiliates in low tax countries than for affiliates in high tax countries or, likewise, for those having a CSA with their parents compared to those without a CSA with their parents. Other explorations of a nonlinear relationship between tax rates and affiliate profitability included interacting the tax rate with the cost sharing fixed effect, using the square of the median effective tax rate, and using the natural log of the median effective tax rate. None of these alternative specifications are reported here because they did not have a significant impact on the results. To isolate the main industries that are driving our results, we estimate equation 3 with industry fixed effects. To isolate the main host countries that are driving our results, we also estimate equation 3 with country fixed effects.

Table 6.2 **Variable definitions and sources**

Variable	Definition	Unit of measure	Source
PTR	Profit-type return; equals net income + host country income taxes – capital gains/losses – income on equity.	Fractional decimal	BEA BE-10/11 surveys
PPE	Net property, plant, and equipment.	Millions of dollars	BEA BE-10/11 surveys
R&D Stock	R&D performed for own account – R&D services exports + R&D services imports, where flow data are converted to a stock using perpetual inventory method.	Millions of dollars	BEA BE-10/11 and BE-120/125 surveys
Royalty Payments	Royalty payments paid by the US parent (foreign affiliates) to the foreign affiliates (US parent).	Millions of dollars	BEA BE-120/125 surveys
Cost Sharing	A binary variable that equals 1 if US parent has a CSA with its foreign affiliates; equals zero otherwise.	Binary 0/1	SEC 10-K text searches
Tax Rate	The median tax rate faced by foreign affiliates in the host country in 2006-2015	Fractional decimal	BEA BE-10/11 surveys

6.5.2 Variable Definitions and Sources

Details about the definitions and data sources used to construct the variables in equations 1 and 3 are provided in table 6.2.

6.5.3 Results

Our econometric results are consistent with the use of CSAs between US parent companies and their foreign affiliates to shift profits to lower tax jurisdictions. The first stage of our analysis is to examine the profitability of US parents with and without CSAs. All else equal, we would expect those with CSAs to be less profitable. Using panel analysis to estimate equation 1, the results in table 6.3 show that, in general, there is not a statistically significant relationship between the profitability of US parents with CSAs and parents without CSAs. This result holds whether examining all industries (column 1) or whether the analysis is limited to the industries where CSAs are concentrated (column 2). However, the lack of significance partly reflects differences in the importance of having a CSA across industries (column 3). In three of the ten NAICS industries in which CSAs are concentrated, there is a significant negative relationship between the profitability of US parents and engaging in CSAs with their foreign affiliates. For example, par-

ents in software publishing (NAICS industry 5112) with CSAs had average profits that were $114 million lower than similarly endowed parents in that industry without CSAs. In one of the ten industries, there is a significant positive relationship between parent profits and engaging in CSAs. In six of the ten NAICS industries, there is not a statistically significant relationship. Although the evidence is mixed, on balance, there is more evidence for our hypothesis than against it. The mixed nature of these results is not surprising given our crude measure of CSA activity and the volatility of our profit measure.

6.5.3.1 Parent Results

Although US parent results are generally consistent with our hypothesis, they provide only a partial understanding of the relationship between CSAs and the location of MNE profits. The US parent estimates provide information about the relative profitability of those with CSAs and those without CSAs, but they do not explain why we observe this relationship. Is it because parents with CSAs are truly less able to generate profits than those without CSAs, or is it the case that parents with CSAs appear less profitable because they shift profits to foreign affiliates in lower tax countries? To help answer this question, we turn to equation 3, which estimates the impact of CSAs on the difference between profitability of foreign affiliates and profitability of their US parent. The results of estimating equation 3 using panel analysis are provided in tables 6.4a and 6.4b.[8]

Overall, affiliates engaging in CSAs with their parents tend to be more profitable than their parents. As illustrated in table 6.4a, in all industries, profits of affiliates with CSAs are $63 million higher on average than similarly endowed US parents. In the three NAICS sectors in which CSAs are concentrated, the difference is $105 million. Across the more detailed NAICS industries, the results are mixed but, overall, tend to support our hypothesis. In six of the ten NAICS industries in which CSAs are concentrated, there are significant positive relationships between the profitability of affiliates relative to their US parents and the existence of a CSA. For example, affiliates in software publishing (NAICS industry 5112) had average profits that were $106 million higher than similarly endowed parents in that industry when a CSA was present. In three of the ten industries, there is a significant negative relationship between the relative profitability of foreign affiliates and the existence of a CSA. In one of the ten NAICS industries, there is not a statistically significant relationship.

We also examine country-level differences by including country of affiliate fixed effects. The results are shown in table 6.4b. Including these country-

8. Similar to the parent-level regressions, we eliminated outliers in the data by trimming the five percent tails in the dependent and independent variables for the regressions reported in tables 6.4a and 6.4b.

Table 6.3 **US parent results, 2006–2015**

Variable	All industries	Key CSA industry sectors[a]	Key CSA industry sectors[b]	Number of parents
Constant	51.930	22.340	53.562	
	(196.343)	(51.699)	(49.480)	
PPE_{USP}	0.139	0.227*	0.226*	
	(0.086)	(0.889)	(0.089)	
$R\&D\ Stock_{USP}$	0.068***	0.055**	0.053*	
	(0.0178)	(0.021)	(0.021)	
$Royalty\ Payments_{USP}$	2.14**	6.600	6.762*	
	(0.678)	(3.497)	(3.380)	
$Cost\ Sharing\ Agreement_{USP}$ (CSA)	–3.83	–13.100		
	(42.612)	(37.688)		
$CSA*NAICS\ 3332_{USP}$			212.466**	6
(Industrial Machinery Manufacturing)			(45.000)	
$CSA*NAICS\ 3341_{USP}$			53.943	9
(Computer and Peripheral Equipment Manufacturing)			(85.161)	
$CSA*NAICS\ 3342_{USP}$			111.905	18
(Communications Equipment Manufacturing)			(135.960)	
$CSA*NAICS\ 3344_{USP}$			–1.586	40
(Semiconductor and Other Electronic Component Manufacturing)			(45.464)	
$CSA*NAICS\ 3345_{USP}$			432.870	17
(Navigational, Measuring, Electromedical and Control Instruments Manufacturing)			(225.264)	
$CSA*NAICS\ 3359_{USP}$			39.656	6
(Other Electrical Equipment and Component Manufacturing)			(32.942)	

(*continued*)

Table 6.3 **(continued)**

Variable	All industries	Key CSA industry sectors[a]	Key CSA industry sectors[b]	Number of parents
$CSA*NAICS\ 3391_{USP}$			–109.885**	13
(Medical Equipment and Supplies Manufacturing)			(37.685)	
$CSA*NAICS\ 5112_{USP}$			–114.485*	23
(Software Publishers)			(50.613)	
$CSA*NAICS\ 5191_{USP}$			–149.912***	8
(Other Information Services)			(53.354)	
$CSA*NAICS\ 5415_{USP}$			–101.049	9
(Computer Systems Design and Related Services)			(95.354)	
Year fixed effects	Yes	Yes	Yes	
Two-digit NAICS fixed effects	Yes	Yes	No	
Number of observations	1,303	1,124	1,124	
Number of US parents	187	164	164	
R squared	0.383	0.371	0.372	

Note: Outliers, defined as observations at or below the 5th percentile and those at or above the 95th percentile, were excluded from the analysis.

Dollar denominated flow data are adjusted for inflation using the GDP implicit price deflator from BEA's NIPA table 1.1.9. Dollar denominated stock data are first adjusted from historical cost to current cost using current-cost to historical-cost ratios from BEA's fixed asset by industry accounts (tables 3.1ESI and 3.3ESI) and are then adjusted for inflation.

Coefficient estimates with heteroscedasticity-robust standard errors in parentheses. Significant coefficients are denoted by ***, **, * at the 1, 5, and 10 percent significance levels, respectively.

[a] Column 2 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54.

[b] Column 3 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54 and estimates cost sharing fixed effects for all four-digit US parent NAICS codes where MNEs with CSA were identified within these two-digit NAICS sectors and the number of MNEs was greater than one.

Table 6.4a **Affiliate-parent difference results (without country fixed effects), 2006–2015**

Variable	All industries	Key CSA industry sectors[a]	Key CSA industry sectors[b]
Constant	209.790	32.660	–149.089***
	(80.088)	(45.017)	(46.457)
PPE_C–PPE_{USP}	–0.012	0.111***	0.093***
	(0.015)	(0.018)	(0.018)
R&D Stock$_C$–*R&D Stock*$_{USP}$	0.079***	0.078***	0.086***
	(0.003)	(0.004)	(0.004)
Royalty Payments$_C$–*Royalty Payments*$_{USP}$	–0.588**	0.058	0.005
	(0.206)	(0.127)	(0.125)
Cost Sharing Agreement$_{USP}$ (CSA)	63.350*	104.810***	
	(24.363)	(24.623)	
Tax Rate$_C$	–289.388	–273.505	–323.225
	(212.994)	(193.314)	(203.401)
*CSA*NAICS* 3332USP			–163.002***
(Industrial Machinery Manufacturing)			(18.046)
*CSA*NAICS* 3341USP			–161.272**
(Computer and Peripheral Equipment Manufacturing)			(61.450)
*CSA*NAICS* 3342USP			920.760***
(Communications Equipment Manufacturing)			(108.229)
*CSA*NAICS* 3344USP			–28.298
(Semiconductor and Other Electronic Component Manufacturing)			(16.833)
*CSA*NAICS* 3345USP			–589.176***
(Navigational, Measuring, Electromedical and Control Instruments Manufacturing)			(60.406)
*CSA*NAICS* 3359USP			166.792***
(Other Electrical Equipment and Component Manufacturing)			(19.138)

(*continued*)

Table 6.4a **(continued)**

Variable	All industries	Key CSA industry sectors[a]	Key CSA industry sectors[b]
*CSA*NAICS* 3391USP			92.549***
(Medical Equipment and Supplies Manufacturing)			(21.635)
*CSA*NAICS* 5112USP			105.620***
(Software Publishers)			(18.617)
*CSA*NAICS* 5191USP			615.167***
(Other Information Services)			(119.880)
*CSA*NAICS* 5415USP			40.323*
(Computer Systems Design and Related Services)			(18.231)
Year fixed effects	Yes	Yes	Yes
Two-digit NAICS fixed effects	Yes	Yes	No
Number of observations	21,251	17,799	17,799
Number of parent-country pairs	3,851	3,281	3,281
R squared	0.448	0.593	0.567

Note: Outliers, defined as observations at or below the 5th percentile and those at or above the 95th percentile, were excluded from the analysis.

Dollar denominated flow data are adjusted for inflation using the GDP implicit price deflator from BEA's NIPA table 1.1.9. Dollar denominated stock data are first adjusted from historical cost to current cost using current-cost to historical-cost ratios from BEA's fixed asset by industry accounts (tables 3.1ESI and 3.3ESI) and are then adjusted for inflation.

The dependent variable is the difference between the country-level aggregates of foreign affiliate profit-type return and the profit-type return of the corresponding affiliate's US parent.

Coefficient estimates with heteroscedasticity-robust standard errors in parentheses. Significant coefficients are denoted by ***, **, * at the one, five, and ten percent significance levels, respectively.

[a] Column 2 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54

[b] Column 3 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54 and estimates cost sharing fixed effects for all four-digit US parent NAICS codes where MNEs with CSA were identified within these two-digit NAICS sectors and the number of MNEs was greater than one.

Table 6.4b **Affiliate-parent difference results with country fixed effects,[a] 2006–2015**

Variable	All industries	Key CSA industry sectors[b]	Key CSA industry sectors[c]
Constant	–133.613	69.246	–162.356*
	(116.397)	(83.518)	(83.610)
PPE_C–PPE_{USP}	–0.025	0.093***	0.073***
	(0.014)	(0.017)	(0.017)
$R\&D\ Stock_C$–$R\&D\ Stock_{USP}$	0.081***	0.083***)	0.084***
	(0.003)	(0.004	(0.004)
$Royalty\ Payments_C$–$Royalty\ Payments_{USP}$	–0.561**	–0.104	–0.138
	(0.174)	(0.128)	(0.126)
$Cost\ Sharing\ Agreement_{USP}$ (CSA)	59.8*	105.590***	
	(24.417)	(24.537)	
$CSA*NAICS\ 3332_{USP}$			–181.133***
(Industrial Machinery Manufacturing)			(20.458)
$CSA*NAICS\ 3341_{USP}$			–182.687**
(Computer and Peripheral Equipment Manufacturing)			(61.862)
$CSA*NAICS\ 3342_{USP}$			943.320***
(Communications Equipment Manufacturing)			(105.658)
$CSA*NAICS\ 3344_{USP}$			–42.956*
(Semiconductor and Other Electronic Component Manufacturing)			(17.489)
$CSA*NAICS\ 3345_{USP}$			–570.638***
(Navigational, Measuring, Electromedical and Control Instruments Manufacturing)			(60.076)
$CSA*NAICS\ 3359_{USP}$			152.231***
(Other Electrical Equipment and Component Manufacturing)			(21.300)
$CSA*NAICS\ 3391_{USP}$			98.008***
(Medical Equipment and Supplies Manufacturing)			(28.149)
$CSA*NAICS\ 5112_{USP}$			95.784***
(Software Publishers)			(18.992)
$CSA*NAICS\ 5191_{USP}$			552.441***
(Other Information Services)			(109.556)

(*continued*)

Table 6.4b **(continued)**

Variable	All industries	Key CSA industry sectors[b]	Key CSA industry sectors[c]
*CSA*NAICS* 5415_{USP}			39.485
(Computer Systems Design and Related Services)			(20.191)
Bahamas 250	1,136.212*	1,1057***	964.532***
	(633.570)	(150.443)	(156.136)
Ireland 313	193.543	236*	184.180
	(126.777)	(109.476)	(109.456)
Year fixed effects	Yes	Yes	Yes
Two-digit NAICS fixed effects	Yes	Yes	No
Number of observations	22,970	19,178	19,178
Number of parent-country pairs	4,285	3,636	3,636
R squared	0.469	0.613	0.588

[a] Country coefficients are reported for large countries with statistically significant coefficients at the 10 percent or higher level of significance for at least one of the regression specifications presented in the table. Large countries are defined as those having an outward foreign direct investment position of greater than $20 billion in 2015. Large countries with statistically insignificant coefficients for all regression specifications at the 10 percent level and higher in order of position size (largest to smallest) are: Netherlands, United Kingdom, Luxembourg, United Kingdom Islands- Caribbean, Bermuda, Singapore, Switzerland, Australia, Germany, Japan, Mexico, China, France, Hong Kong, Brazil, Belgium, Korea, Spain, India, Norway, Sweden, Italy, Chile, and Gibraltar.

Outliers, defined as observations at or below the 5th percentile and those at or above the 95th percentile, were excluded from the analysis.

The dependent variable is the difference between the country-level aggregates of foreign affiliate profit-type return and the profit-type return of the corresponding affiliate's US parent.

Dollar denominated flow data are adjusted for inflation using the GDP implicit price deflator from BEA's NIPA table 1.1.9. Dollar denominated stock data are first adjusted from historical cost to current cost using current-cost to historical-cost ratios from BEA's fixed asset by industry accounts (tables 3.1ESI and 3.3ESI) and are then adjusted for inflation.

Coefficient estimates with heteroscedasticity-robust standard errors in parentheses. Significant coefficients are denoted by ***, **, * at the 1, 5, and 10 percent significance levels, respectively.

[b] Column 2 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54.

[c] Column 3 includes US MNEs classified in the two-digit NAICS sectors 33, 51, and 54 and estimates cost sharing fixed effects for all four- digit US parent NAICS codes where MNEs with CSA were identified within these two-digit NAICS sectors and the number of MNEs was greater than one.

level fixed effects does not change the overall results, but they do highlight the countries that are contributing most to the overall results. At the country level, affiliates in the Bahamas had average profits that were $965 million higher than a similarly endowed US parent. This finding is consistent with the use of the "Double Irish Dutch Sandwich" tax strategy, which is explained in appendix B.

6.6 Conclusions and Next Steps

The relationship between tax law and the real activities of MNEs has generated widespread interest. This study builds on Guvenen et al. (2017), which shows, at the aggregate level, how strategic movement of IP by MNEs can have important effects on key economic aggregates such as GDP and the trade balance. The apportionment technique used in that paper was mainly designed to answer "how large" the effect of profit shifting by MNEs has been. With our research, we begin to address "how they did" by identifying MNEs that have engaged in CSAs with their foreign affiliates and how those arrangements appear to have affected the geographic allocation of MNE profits.

We explore profit shifting behavior by US MNEs through the use of CSAs. Using a sample of R&D-intensive MNEs from BEA surveys, we use text searches of 10-K documents to identify which of these US MNEs had CSAs between US parents and their foreign affiliates in the 2006–2015 period. We test our hypothesis that having a CSA is associated with relatively lower profits for the US parent and relatively higher profits for foreign affiliates. The initial findings generally support our hypothesis that CSA activity between parents and affiliates is associated with profit shifting. Specifically, while evidence using data for parents alone is inconclusive, when we combine data for parents and affiliates, we find that affiliates of parents with a CSA are more profitable relative to their parents than those without a CSA. In addition, through our use of country fixed effects in the regressions, we can associate this activity with the use of a Dutch Sandwich tax strategy.

Our ability to draw strong conclusions on the use of CSA to facilitate profit shifting among US MNEs was negatively impacted by data limitations. Obtaining information on CSAs and linking the data from the two sets of surveys were two of the greatest challenges in this project. Future research will include exploring potential additional sources for data on CSAs and continuing to improve the links between the BEA AMNE and services surveys. Despite these limitations, we feel that this chapter makes a contribution by using firm-level data to explore how a specific tax can be used to shift profits across units of US MNEs in different countries and affect the measurement of national and international economic accounts in those countries.

Appendix A

Description of Selected NAICS Industry Codes

Table 6A.1 Description of selected NAICS industry codes

NAICS industry code	Description
3332	Industrial Machinery Manufacturing
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing
3339	Other General Purpose Machinery Manufacturing
3341	Computer and Peripheral Equipment Manufacturing
3342	Communications Equipment Manufacturing
3343	Audio and Video Equipment Manufacturing
3344	Semiconductor and Other Electronic Component Manufacturing
3345	Navigational, Measuring, Electromedical and Control Instruments Manufacturing
3346	Manufacturing and Reproducing Magnetic and Optical Media
3359	Other Electrical Equipment and Component Manufacturing
3361	Motor Vehicle Manufacturing
3362	Motor Vehicle Body and Trailer Manufacturing
3364	Aerospace Product and Parts Manufacturing
3391	Medical Equipment and Supplies Manufacturing
3399	Other Miscellaneous Manufacturing
5112	Software Publishers
5191	Other Information Services
5413	Architectural, Engineering, and Related Services
5414	Specialized Design Services
5415	Computer Systems Design and Related Services

Appendix B

Double Irish Dutch Sandwich Tax Strategy

One tax strategy that has been used by US multinational enterprises (MNEs) to reduce (or eliminate) taxes on their IP is known as a "Double Irish Dutch Sandwich." Under this arrangement, IP is held by an affiliated entity in a low tax location such as a Caribbean tax haven country like the Bahamas, where corporate profits are not taxed (Entity B in the diagram). This Caribbean entity is often a brass plate entity having no employees and little, if any, physical presence. Although a resident in a Caribbean Island, it is incorporated in Ireland.

The Caribbean entity, in turn, owns Entity C, an Irish resident and Irish incorporated operating affiliate, and Entity D, a Netherlands resident and Netherlands incorporated affiliate that serves as an intermediary between

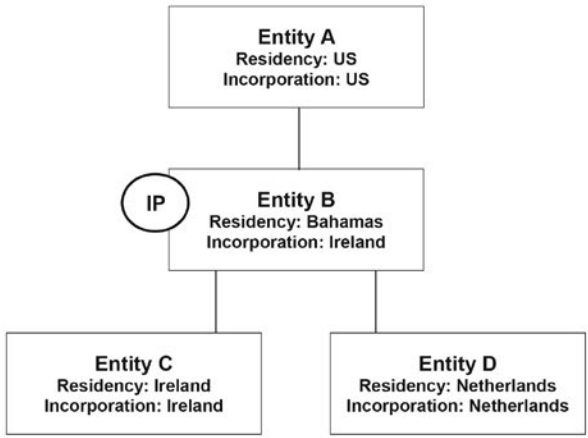

Figure 6B.1 Double Irish Dutch Sandwich Tax Strategy

Entities B and C. Entity B in the Bahamas licenses the IP to Entity D in the Netherlands, which, in turn, licenses the IP to Entity C in Ireland. As the Ireland resident affiliate (Entity C) earns income on the IP, it could pay royalties to the Netherlands resident affiliate (Entity D) without incurring a withholding tax penalty because both countries are members of the European Union. Entity D could then pay royalties to its parent, Entity B, in the Caribbean free of withholding taxes because the Netherlands does not impose withholding taxes on royalties. The Netherlands resident affiliate will undoubtedly charge a small fee for serving as an intermediary, which will be taxed at the Netherlands corporate tax rate of 25 percent. Thus, very little of the income on the IP is subject to taxation and overall the MNE will enjoy a very low effective tax rate on that income. The MNE could avoid US taxation on income because Entities B and C are regarded as a single consolidated entity by the US tax authority and, until 2018, foreign profits generally were not taxed until they were repatriated to the United States. The MNE would be exempt from Irish taxation on income generated by the IP because Irish entities are taxed based on where central management and control is located, which is the brass plate affiliate (Entity B) in the Caribbean.

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