

Conflicting Transfer Pricing Incentives and the Role of Coordination*

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ABSTRACT

Our study evaluates the role of coordination, at both the government and the firm level, on the transfer prices set by U.S. multinational corporations (MNCs) when income taxes and duties cannot be jointly minimized with a single transfer price. We find that either the presence of a coordinated income tax and customs enforcement regime or coordination between the income tax and customs functions alters transfer prices for these firms. Our analyses have implications for both firms and taxing authorities. Specifically, our findings suggest that MNCs might decrease their aggregate tax burdens by increasing coordination within the firm or that governments might increase their aggregate revenues by improving coordinating enforcement across taxing authorities. Our study is novel in that we document, in a specific setting, how coordination influences MNCs' tax reporting behavior.

Motivations conflictuelles dans l'établissement des prix de cession interne et rôle de la coordination

RÉSUMÉ

Les auteures évaluent le rôle de la coordination, tant à l'échelon des administrations fiscales qu'à celui de l'entreprise, dans l'établissement de prix de cession interne par les sociétés multinationales des États-Unis lorsqu'un prix de cession interne ne permet pas de réduire au minimum à la fois les impôts sur les bénéfices et les droits de douane. Elles constatent que la présence d'un régime coordonné d'application de l'impôt sur le revenu et des droits de douane ou une coordination des fonctions fiscale et douanière modifie les prix de cession interne de ces sociétés. Leurs analyses ont des répercussions tant pour les entreprises que pour les administrations fiscales. Plus précisément, les résultats de ces analyses laissent croire que les sociétés multinationales pourraient réduire leur fardeau fiscal global grâce à une meilleure coordination au sein de l'entreprise ou que les administrations fiscales pourraient accroître leurs recettes globales en améliorant la coordination de l'application de l'impôt et

* Accepted by Tom Omer. We thank Andrew Bernard, Brian Cromwell, Lisa De Simone, Dhammika Dharmapala, Nadja Dwenger, Alex Edwards, Merle Erickson, Bill Kinney, Kevin Markle, Ray Mataloni, Peter Merrill, Lillian Mills, Tom Omer, John Romalis, Damon Pike, Richard Sansing, Matthew Slaughter, Joel Slemrod, and two anonymous referees for insightful comments. We also thank participants of the Oxford Centre for Business Taxation Summer Symposium, the University of Illinois Tax Symposium, the International Tax Policy Forum annual meeting, the University of Washington Tax Brown Bag Series, and the University of Texas Workshop Series for helpful discussions. The authors appreciate financial support from the International Tax Policy Forum. The statistical analysis of firm-level data on U.S. multinational companies was conducted at the Bureau of Economic Analysis, Department of Commerce, under arrangements that maintain legal confidentiality requirements. The views expressed are those of the authors and do not reflect official positions of the U.S. Department of Commerce.

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des droits de douane dans les différentes administrations fiscales. L'étude est novatrice en ce que les auteurs documentent, dans un contexte défini, de quelle façon la coordination influe sur le comportement des sociétés multinationales en matière de déclarations fiscales.

1. Introduction

Accounting research generally focuses on income taxes, though corporations remit multiple taxes that are often significant. Examples include import duties, property taxes, payroll taxes, and value-added taxes (Christensen et al. 2001; Desai et al. 2004; Robinson 2012). If the tax base has some commonality across different types of taxes, it is conceivable that multinational corporations (MNCs) face a trade-off regarding which type of tax they minimize. In the context of international trade with related parties, a trade-off often exists between minimizing customs duties and income taxes.¹ This paper examines that trade-off because import duties are assessed on the transfer price of the imported goods, minimizing duties affects income taxes because the transfer price is also used to allocate taxable income between the buyer and seller. Consider an entity with a 35 percent income tax rate and a 5 percent duty rate that buys goods from an affiliated entity in a jurisdiction with a 25 percent income tax rate. A transfer price of \$100 would result in a \$5 duty; a transfer price of \$80 would result in a \$4 duty, and so on. However, lowering the transfer price by \$20 reallocates \$20 of income from a jurisdiction imposing a 25 percent income tax rate to one imposing a 35 percent rate. This increases the MNCs' income taxes by \$2 and usurps the \$1 duty savings. Thus, duty-minimizing and income tax-minimizing incentives conflict with the right combination of relative income tax rates and direction of trade between the affiliated entities.²

We begin by documenting that this conflict results in MNCs' transfer prices being less sensitive to income tax rates and more sensitive to customs duties. We further hypothesize that firms' response to this trade-off will vary conditional on the existence of two different types of coordination. The first, governmental coordination, considers whether the enforcement function is integrated across the multiple types of taxes. The second, corporate coordination, considers whether the transfer pricing function is integrated, that is, across the income tax and the operations (customs) departments or between the various affiliate entities. Our findings suggest that firm coordination could decrease aggregate tax burdens and that government coordination could increase aggregate revenues.

The accounting, finance, and economics literatures provide ample empirical evidence that the division of profits among affiliated entities is sensitive to income tax rates (see Hines 1997 and U.S. Treasury 2007 for a review). Relatively fewer studies, in the economics literature, document that transfer prices are also sensitive to duty rates (Swenson 2001; Clausing 2003; Bernard et al. 2006).³ Although the interaction between transfer prices set for income tax and customs purposes has gained little academic attention (with the exception of early theoretical work by Horst 1971 and Samuelson 1982), it was the

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1. Customs duties are taxes imposed on the declared value of imported goods.
 2. We elaborate on these conditions when we model the conflict. In general, we show that a higher income tax rate seller and lower income tax rate buyer will minimize firm-wide income taxes with a low price, whereas the opposite conditions will minimize firm-wide income taxes with a high price. Because duties will always be minimized with a low price, the incentives conflict for lower income tax rate sellers and higher income tax rate buyers.
 3. To provide some perspective on the economic importance of customs duties, OECD (2010) reports that tax revenue from (i) customs duties and (ii) corporate profits, as a percent of total tax revenue, are 3 and 8 percent, respectively. These figures include all OECD countries and cover the time period 1965 through 2008. Interestingly, although duty payments provide over a third of the total tax revenue that income taxes provide, the empirical transfer pricing literature is nearly void of analyses of customs duties.

subject of two major conferences. Held in 2006 and 2007, and jointly organized by the World Customs Organization (WCO) and the Organization for Economic Cooperation and Development (OECD), these conferences included customs and tax authorities from around the world, as well as members of the international trade community. The clear message is that because transfer prices set on intrafirm trade simultaneously affect MNCs' income tax and customs duty obligations, "[t]ransfer pricing is both a corporate tax and a customs valuation issue" (KPMG 2007).

Using data from confidential and mandatory surveys of the U.S. MNCs conducted by the Bureau of Economic Analysis (BEA), we identify foreign affiliates that engage in intrafirm trade in tangible goods with their U.S. parent. We develop a measure of the direction of U.S. parent-affiliate net trade and use this together with proxies for the relevant income tax and duty rates to parse our sample of foreign affiliates into two groups: (i) those for whom minimizing income taxes requires a high intrafirm transfer price on goods and thus increases duties (transfer pricing incentives "conflict"), and (ii) those for whom minimizing income taxes requires a low intrafirm transfer price on goods and thus decreases duties (incentives do not conflict).

Drawing from empirical income tax transfer pricing literature, we use an empirical specification that provides evidence consistent with income tax-motivated transfer pricing and find that MNCs decrease their use of transfer prices that minimize income taxes when incentives conflict, compared to when incentives do not conflict. Though this may seem intuitive, if MNCs with conflicting incentives are able to report different prices to income tax and customs authorities (to minimize both taxes) as many analytic models allow, then we would observe no difference in transfer prices across these two groups of firms.⁴ Our results suggest that the presence of duties attenuates income tax-motivated transfer pricing. This result is important because it suggests that, on average, MNCs use consistent prices for income taxes and duties.

Next, we develop and test two hypotheses that focus on the effect of coordination on transfer prices of MNCs with conflicting income tax and duty minimization incentives. Our first hypothesis centers on the governmental coordination of income tax and customs enforcement. In the presence of coordinated enforcement, any MNC using inconsistent prices is more likely to be challenged. Our second hypothesis considers corporate coordination of the income tax and customs functions within the MNC. In the presence of internal coordination, MNCs are more likely to recognize when conflicting incentives exist and have information systems in place to set transfer prices that minimize the sum of income taxes and duties. In both cases, we expect that MNCs with conflicting incentives further adjust their transfer prices.

We find evidence consistent with our predictions. First, we find that when incentives conflict, governmental coordination is associated with a further reduction in the use of transfer prices that minimize income taxes. This result suggests that a coordinated enforcement regime has a deterrent effect on MNCs' use of inconsistent prices and, that in the absence of this coordination, some MNCs may use inconsistent prices more aggressively to minimize the sum of income taxes and duties. In supplemental analyses, we explore the implications of this result on the aggregate tax burden of MNCs and find that MNCs with affiliates with higher governmental coordination report relatively *higher* aggregate tax burdens compared to other MNCs.

4. For example, Horst (1971) models the declared value used to determine the customs duty as π times the price used for income tax purposes, where π may be greater than or less than one, depending on the incentives of the MNC. The use of different prices for income tax and customs purposes is not illicit so long as the assumptions and assertions underlying a firm's selected transfer prices are consistent. In some cases, the valuation methods used for income taxes and customs can result in legitimate differences.

Second, we find that when incentives conflict, firm coordination further reduces an MNC's use of transfer prices that minimize income taxes. Because the primary oversight of transfer pricing is typically found in income tax departments (TEI 2005; EY 2008), in the absence of this coordination, MNCs are more likely to myopically focus on income tax minimization, failing to recognize that these prices will result in higher duties. Thus, our finding is consistent with more coordinated firms altering their income tax transfer prices to minimize the sum of income taxes and duties. Indeed, our supplemental analyses show that MNCs with affiliates that are more coordinated with the U.S. parent report relatively *lower* aggregate tax burdens.

Our study makes several important contributions to the academic literature. First, our study is the first empirical analysis of transfer pricing behavior in the presence of conflicting income tax and duty incentives.⁵ Second, we document how firms' aggregate tax burdens are influenced by two different types of coordination: integrated enforcement within a taxing jurisdiction and integrated transfer pricing function within the firm.⁶ Finally, our paper joins work such as Desai et al. (2004) and Robinson (2012) in demonstrating that non-income taxes are salient in firms' tax reporting behavior. Collectively, our results suggest that MNCs can lower their aggregate tax burden by increasing coordination between foreign affiliates and the parent entity.

As with all empirical observational studies, there are several caveats regarding our results. First, our sample consists primarily of large, profitable U.S.-domiciled, multinational firms. Accordingly, our results may not generalize to smaller firms. Second, our analysis focuses on transfer pricing incentives for tangible goods. While there has been significant attention focused on the transfer of intangible goods, the broad majority of U.S. MNCs' transfer pricing activity still applies to transfers of tangible goods. Third, we are unable to observe the exact type of goods transferred between the U.S. parent and its foreign affiliates. Thus, we must rely on an estimate of the customs duties of entities importing between the United States and a particular foreign jurisdiction to measure the applicable duty rates. This approach, however, should bias against us finding results. Fourth, like all empirical transfer pricing research, we must rely on a model of transfer pricing incentives that has flaws. For instance, our model focuses on the MNC-level incentive to minimize income taxes and customs duties but neglects affiliate-level incentives to maximize income for compensation purposes. Finally, as we cannot directly observe a firm's transfer pricing and coordination activities, our proxies undoubtedly include measurement error.

2. Institutional background and relevant literature

Income tax transfer pricing

The operations of MNCs entail numerous transactions between affiliated entities located in different jurisdictions but within the same controlled group. The prices attached to these transactions are known as "transfer prices." The OECD establishes transfer pricing guidelines for income tax reporting, and most countries have adopted some form of these regulations. Known as the "arm's length principle," valuation for income tax is required to be established using prices that would have been realized if the parties were unrelated.

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5. Baldenius et al. (2004) model conflicting incentives arising between external tax reporting and internal compensation, rather than between two external reporting systems. Our study provides an interesting setting to examine the role of coordination both because the two transfer prices in our study are monitored and enforced by a third party and because the two prices have implications for firms' aggregate tax burdens.
 6. Gallemore and Labro (2015) document a positive association between firms' internal information quality (i.e., "coordination") and income tax burdens, but do not explore a specific channel through which this occurs.

Transfer pricing is but one way that MNCs can minimize their worldwide income tax burden. Locating intangible property abroad and intercompany debt are two other commonly studied methods. Because we are interested in customs duties that are levied on trade, we focus on transfer prices of goods.

There is an extensive empirical literature that studies transfer pricing motivated by income tax minimization. This literature recognizes that it is generally advantageous for firms to minimize income reported in affiliates located in high-income-tax jurisdictions and to maximize income reported in affiliates located in low-income-tax jurisdictions. Empirical studies typically rely on statistical relations between income tax rates and profitability (or trade prices, which affect profitability) to provide evidence consistent with income tax-motivated transfer pricing (e.g., Klassen et al. 1993; Grubert and Mutti 1991; Hines and Rice 1994).

For instance, studies document a negative association between entities' income tax rates and reported pre-tax income, suggesting that transfer prices are influenced by income tax considerations. Clausing (2003) does not examine firm-level incentives or consider customs duties, but her study, which documents a negative association between income tax rates and trade prices, suggests that income tax-motivated transfer pricing is an important consideration in intrafirm international trade in goods. Similarly, Bernard et al. (2006) use U.S. export transaction data in their study and find lower prices on goods exported to countries with lower income tax rates, consistent with minimizing worldwide income tax by reporting lower revenue in the United States.⁷

Customs duty transfer pricing

Because customs duties are levied on the transaction price, transfer prices will also affect the amount of customs duty paid. While the OECD establishes transfer pricing guidelines, customs valuation methods are established by the WTO. Like the income tax transfer pricing regulations, prices for customs duty reporting are also required to be "arm's length."

Empirical customs duty transfer pricing studies are less common than empirical income tax transfer pricing studies, likely because of the difficulty of obtaining data on transaction prices or goods flows. Swenson (2001) examines customs values of certain U.S. imports from five countries and finds evidence consistent with transfer pricing incentives created by income taxes and customs duties.⁸ Bernard et al. (2006) also use U.S. export transactions to study the effect of customs duties on transfer prices and find lower prices on goods exported to countries that impose high import duty rates.

Conflicting incentives between income tax and customs duty transfer pricing

Although there is extensive empirical research on whether and to what extent firms' transfer prices are consistent with the incentives to minimize either income taxes or customs duties, there is little empirical research regarding how MNCs resolve the conflicting objective of minimizing both income taxes and customs duties. For example, although Bernard et al. (2006) include both the income tax rate and the import duty rate in certain

7. Bernard et al. (2006) explicitly assume that the United States is a high-tax country. Though there are currently few countries in the world with income tax rates higher than the United States, our study examines the transfer pricing behavior during the time period 1982 through 2005, when many countries' income tax rates were higher than the United States' rate. This does not limit the generalizability of our results because our insights apply to transactions occurring between two non-U.S. entities as well. Moreover, the United States may lower its rate in the future.

8. Swenson (2001) computes a transfer pricing incentive variable that combines income tax and duty rates for various products imported into the United States. As the data used in her study for 1981 to 1988 include non-intrafirm trade and imports by entities with foreign parents, and are at the product-level, she cannot examine firm-level incentives, and thus does not explore the transfer pricing optimization problem relevant to firms that face conflicting incentives or the role of coordination in that optimization problem, which are the focus of our study.

regression specifications, they do not specifically consider that the transfer pricing incentives can either align or conflict depending on the income tax and customs duty rate of the foreign jurisdiction.

We follow the prior analytic literature on the joint effect of income taxes and customs duties and outline a simple model that involves an MNC earning income in two affiliated entities located in jurisdictions that impose different income tax rates.⁹ One entity, the seller or exporter, produces a good at a cost of zero and sells the good to the other affiliated entity, the buyer or importer, at a price P . The buyer receives the good worth P and sells the good for R to the end customer. Let t_b be the income tax rate in the buyer's jurisdiction and t_s the income tax rate in the seller's jurisdiction. Finally, the buyer pays an import duty at rate d ; while we initially assume that the declared value equals the price, and thus this duty rate is applied to the price P , we will later relax the assumption. We can thus specify the after-tax profits as follows:

$$\text{Buyer : } (R - P - dP)(1 - t_b)$$

$$\text{Seller : } (P - 0)(1 - t_s)$$

$$\text{Total profit : } R(1 - t_b) + P(t_b - t_s) - dP(1 - t_b)$$

The total profit expression includes three components: after-tax revenue, $R(1 - t_b)$; income tax transfer pricing effects, $P(t_b - t_s)$; and duty effects, $dP(1 - t_b)$. This expression illustrates that to reduce the firms' duty obligation, the buyer simply reports a lower price, P , to the customs authority. However, to the extent that the buyer's income tax rate (t_b) is lower than the seller's income tax rate (t_s), every incremental dollar of P decreases the group's total profit by increasing its total tax burden (i.e., $P(t_b - t_s) < 0$). When $t_s > t_b$ the affiliated group has a simple cost minimization problem: firms will minimize both income taxes and duties by setting P as low as can be justified to the taxing authority.

When $t_b > t_s$, the price-setting function becomes more complicated because of conflicting transfer pricing incentives. As discussed above, a lower P will always reduce the firm's duty obligation. However, it also increases the firm's aggregate income tax obligation because P constitutes the buyer's cost of goods sold. Because there is a trade-off between income tax and duty transfer pricing incentives, the optimal transfer price will depend on the relation between the duty and income tax rates.

To illustrate the role of duties, we derive the partial derivative of total profits with respect to P and estimate the duty rate that effectively neutralizes the firm's transfer pricing incentives. When $d = (t_b - t_s)/(1 - t_b)$, firms no longer derive any tax benefit from shifting profits between the buyer and seller. In reality, this equality is unlikely to hold. First, duty rates are a function of trade policy objectives that are typically addressed independently of tax policy objectives. Second, this would involve coordination between two countries or trading partners with respect to domestic income tax policy.

Assuming that $d \geq 0$ (i.e., there are no import subsidies), this equality requires $t_b > t_s$. We can then evaluate the firm's transfer price incentives as a function of the relation between t_b and t_s . As addressed above, when $t_s > t_b$, the firm has no transfer pricing conflict. When $t_b > t_s$, the affiliated group, or firm, should set P low when $d > (t_b - t_s)/(1 - t_b)$ and high when $d < (t_b - t_s)/(1 - t_b)$. This equation highlights that it is not the absolute duty rate or income tax rate, but rather the duty rate *relative* to both the buyer's

9. Our model is similar to Horst (1971) except we normalize the cost to zero and assume only one good is produced (and thus production occurs in only one country and trade flows only one way).

and the seller’s income tax rate, that dictates the pricing incentive. Figure 1 summarizes the above discussion.

Our analysis presumes that firms must report a consistent price, P , to both the income tax and customs authorities. But when transfer pricing incentives conflict (as described in Figure 1), firms may desire to report one price to the income tax authority, P_I , and another price to the customs authority, P_C . This is because the total profit expression from above increases as the spread between P_I and P_C grows. Just as application of the transfer pricing regulations for income tax purposes produces a range of acceptable prices, the different income tax and customs regulations are likely to produce a range of acceptable disparities between P_I and P_C . So long as these differences are not too large or egregious in practice, the affiliated group will benefit from such a strategy. The extent to which the practice of reporting different prices exists is unknown.

3. Hypothesis development

While prior literature finds evidence that income tax and duty considerations separately influence transfer pricing behavior, the literature has not addressed the role of coordination in the presence of conflicting transfer pricing incentives. We identify two separate channels through which coordination might influence firms’ transfer pricing policies in the presence of a conflict: (i) coordination of tax enforcement within governments (governmental coordination), and (ii) coordination of transfer pricing decisions within firms (corporate coordination).

Governmental coordination

Firms that have conflicting transfer pricing incentives (as in Figure 1) benefit from maximizing the difference between P_I and P_C (i.e., a high P_I but low P_C). This is true so long as the difference does not increase scrutiny by taxing authorities or can be sustained under scrutiny. Coordination between the administration and enforcement of revenue and customs should increase these firms’ real or perceived cost of being too aggressive with this strategy.

For example, OECD (2010) notes that customs valuations can be useful to income tax administrators, and vice versa. Customs officials and income tax administrators have contemporaneous documentation prepared by the taxpayer that contains detailed information on the circumstances of transactions. Further, a 2008 E&Y survey reports that 33 percent of parent company respondents that have undergone a transfer pricing or customs audit were aware of an information exchange between income tax and customs authorities. Additionally, 19 percent of parent company respondents have had transfer prices challenged as the result of a joint income tax and customs audit, with responses greater than 30 percent in some countries.

Figure 1 Transfer pricing incentives to minimize income tax and/or customs duty

| | |
|---|---|
| Buyer is high-income-tax $(t_b > t_s)$ | Buyer is low-income-tax $(t_b < t_s)$ |
| (I) Conflict Optimal P depends on d relative to $(t_b - t_s)/(1 - t_b)$ | (II) No Conflict Optimal P is as low as possible |

Notes: The income tax rate in the buyer’s (seller’s) jurisdiction is t_b (t_s). P is the price of the good being traded. The buyer pays an import duty on the price, P , at rate d . Conflicting income tax and duty minimization incentives arise only when the buyer is high-income-tax because a low P minimizes both the worldwide income tax and the import duty when the buyer is low-income-tax.

Given the statistics above, we argue that governmental coordination decreases the likelihood that firms will aggressively report inconsistent prices to minimize their tax burden. Thus, we anticipate that firms with conflicting incentives and governmental coordination will alter their transfer pricing behavior compared to firms with conflicting incentives that do not have governmental coordination. Specifically, we anticipate that transfer prices set for income tax purposes will align more closely with prices reported to the customs authority, notwithstanding the increase in income tax payments.¹⁰ Our first hypothesis is as follows:

HYPOTHESIS 1. MNCs with conflicting income tax and customs duty transfer pricing incentives exhibit less income tax-motivated transfer pricing when governmental enforcement of transfer prices for income tax and customs duty purposes is more likely to be coordinated.

Corporate coordination

The extent of internal coordination and information sharing between the income tax and customs functions varies across firms. A survey of tax directors documents that 81 percent of tax departments at corporate headquarters claim responsibility for setting transfer prices for income tax purposes (TEI 2005). Moreover, tax directors report that transfer prices set for income tax purposes are likely to be used for customs purposes (TEI 2005; EY 2008). Finally, less than half of corporate tax directors surveyed interact with the customs function in their organization because they do not view it as part of the tax function (EY 2008). Therefore, coordination between the income tax function at the corporate headquarters and the customs function at the local operations is expected to be relatively weak in many firms.

If MNCs rely on one transfer price for income tax and customs duties reporting and if this price is set by the income tax department, then a lack of interaction between the income tax and customs functions can result in too much focus on income tax minimization at the expense of customs duties minimization. Therefore, MNCs with conflicting incentives and lower internal coordination will have higher aggregate tax burdens relative to other MNCs.

Figure 1 suggests that the process of price setting is simple for some firms and complicated for others. MNCs in segment (II) of Figure 1 need not know the import duty or the exact income tax rates to set P , as long as they are certain that $t_b < t_s$. However, MNCs in segment (I) need to understand the relation between d and $(t_b - t_s)/(1 - t_b)$. For conflicted affiliates, corporate coordination should draw attention to this optimization problem and facilitate a resolution, either by making the transfer price an MNC-level decision rather than an affiliate-level decision or by increasing communication such that the existence of the conflict and the values needed to solve it are more easily known. We argue that when coordination between the income tax and customs function is relatively high, then MNCs with conflicting incentives will more likely adjust transfer prices to minimize the sum of income taxes and duties. Thus, our second hypothesis is as follows:

HYPOTHESIS 2. MNCs with conflicting income tax and customs duty transfer pricing incentives exhibit less income tax-motivated transfer pricing when corporate transfer

10. Firms may also adjust the price used for customs purposes to be more consistent with the price used for income taxes. We are unable to detect this in our data. Thus, our findings potentially understate the deterrent effect of governmental coordination on firms' use of inconsistent prices and bias us against finding results.

pricing decisions for income tax and customs duty purposes are more likely to be coordinated.

4. Sample and variable measurement

Sample

We study transfer pricing within U.S. MNCs using BEA *Annual and Benchmark Surveys of U.S. Direct Investment Abroad*. Beginning in 1982, federal law requires U.S. MNCs to report certain financial and operating data for both domestic and foreign operations to the BEA each year. A U.S. MNC is the combination of a single U.S. entity, called the U.S. parent, and at least one foreign affiliate in which the U.S. parent holds, directly or indirectly, at least a 10 percent equity interest. The amount of data collected by the BEA varies by year and depends on whether the affiliate meets a reporting threshold.¹¹

The BEA data allow us to observe classified Generally Accepted Accounting Principles (GAAP)-based income statements and balance sheets for foreign affiliates that include important items for our analysis, such as total income tax expense, net income, total assets, and total employee compensation. The financial data are reported on a fiscal year basis, in U.S. dollars, and in accordance with U.S. GAAP. We also observe other key information such as trade in goods between each affiliate and its U.S. parent and each affiliate's country and industry.

Table 1, panel A, details our final sample selection of 55,893 foreign-affiliate-year observations. We begin with 226,365 affiliate-year observations in the period 1982 through 2005 that provide all of the required variables for our study. We first exclude entities that may not have transfer pricing incentives created by the U.S. corporate income tax system by eliminating foreign-controlled U.S. subsidiaries, non-corporate affiliates of corporate U.S. parents, and non-corporate U.S. parents (and their affiliates). We exclude banking and insurance entities, and holding company affiliates (i.e., NAICS 5512 and SIC 671) for two reasons. First, these entities do not conduct the type of import and export activity we examine in our study. Second, as these firms generate little nonfinancial income, the model of expected (i.e., unshifted) income as a function of labor and capital that we rely on in our empirical tests is not well specified for them.

We follow the extant transfer pricing literature and exclude unprofitable affiliates and unprofitable U.S. parents (and their affiliates) because the income-shifting incentives for entities with losses are less clear (e.g., De Simone et al. 2016; Power and Silverstein 2007).¹² Finally, we delete affiliates we cannot classify as either a net buyer or a net seller with its U.S. parent and exclude observations missing gross domestic product information. The final sample for our main tests consists of 55,893 affiliate-year observations over 2,418 U.S. parents and 16,744 of their foreign affiliates for a 23-year period. In tests of the effect of governmental coordination, we lose 5,379 affiliate-year observations because some countries represented in our sample did not participate in the OECD survey from which we draw the measures of government-level coordination.

Table 1, panel B, illustrates that a majority of foreign affiliates in our final sample operate in the chemical (18 percent), durable goods (29 percent), or retail (32 percent)

11. In order to reduce the reporting burden, the BEA requires affiliates to participate in its surveys if its assets, sales, or net income (loss) exceed the threshold for the year. The thresholds are lower in benchmark years (i.e., 1982, 1989, 1994, 1999, and 2004) requiring more affiliates to report. For example, thresholds are \$7 million in 1999, \$30 million in 2000–2003, and \$10 million in 2004. See Mataloni (2003) for detailed information on BEA data. Throughout the paper, references to the “U.S. parent” describe data for the domestic operations only.

12. As a practical matter, the dependent variable in our regression model (described in section 5) is the log of foreign affiliate pre-tax income and the natural log of a negative number is not defined.

TABLE 1
Sample selection and composition by industry

| Panel A: Sample selection | Foreign affiliate-years | Foreign affiliates | U.S. parents |
|--|----------------------------|-----------------------|--------------|
| Affiliates reporting required data from 1982-2005 | 226,365 | 59,900 | 4,893 |
| Less: | | | |
| Foreign-controlled U.S. subsidiaries | 5,815 | 2,054 | 144 |
| Non-corporate entities | 15,866 | 3,478 | 174 |
| Banks and insurance entities | 13,630 | 3,870 | 322 |
| Holding company affiliates | 12,193 | 2,000 | 12 |
| Unprofitable entities | 41,394 | 8,549 | 386 |
| Affiliates not trading goods with U.S. parent | 77,855 | 22,436 | 1,390 |
| Missing GDP | 3,719 | 769 | 47 |
| Final sample | 55,893 | 16,744 | 2,418 |
| Panel B: Industry composition of sample | | | |
| Industry | Percent | | |
| Retail | 32.4 | | |
| Durables | 29.2 | | |
| Chemical | 17.8 | | |
| FoodtTextileTex | 5.3 | | |
| Textile | 5.0 | | |
| Computers | 4.5 | | |
| Extraction | 2.3 | | |
| Services | 2.1 | | |
| Panel C: Country composition of sample | | | |
| Country | Percent | | |
| Canada | 12.90 | | |
| United Kingdom | 10.49 | | |
| Germany | 7.33 | | |
| France | 6.19 | | |
| Japan | 5.16 | | |
| Australia | 4.65 | | |
| Italy | 4.30 | | |
| Netherlands | 4.23 | | |
| Mexico | 3.86 | | |
| Brazil | 3.07 | | |
| Belgium | 3.01 | | |
| Switzerland | 2.91 | | |
| Spain | 2.82 | | |
| Hong Kong | 2.72 | | |
| Singapore | 2.42 | | |
| Ireland | 1.95 | | |
| Sweden | 1.46 | | |
| Taiwan | 1.29 | | |
| South Africa | 1.24 | | |

(The table is continued on the next page.)

TABLE 1 (continued)

| Panel C: Country composition of sample | |
|---|---------|
| Country | Percent |
| Venezuela | 1.24 |
| Argentina | 1.10 |
| South Korea | 1.04 |
| Malaysia | 1.01 |

Notes: Panel B lists industry groups that represent at least 1 percent of the final sample of foreign affiliates. Panel C lists countries that represent at least 1 percent of the final sample of foreign affiliates.

industries. The chemical industry incurs customs duties on fertilizers, soaps, and cosmetics; the durable goods industry on home appliances, consumer electronics, furniture, sports equipment, and toys; and the retail industry on products such as clothing, shoes, and handbags. Duty rates are typically assessed such that products that seem similar often have disparate rates.¹³ Consider the *Toy Biz v. U.S. International Trade Case* (Court Number 96-10-02291) where customs authorities argued that X-Men action figures were “Dolls representing human beings” subject to a 12 percent duty rate. Toy Biz, on the other hand, argued that the action figures were “Other toys” subject to a 6.8 percent duty rate.¹⁴ As evidenced by such cases heard in international trade courts, firms actively attempt to minimize duty payments in practice.

Panel C of Table 1 details the jurisdictional breakdown of affiliates in our sample when at least 1 percent of the sample is located in a particular jurisdiction. The distribution is not surprising because countries with the largest percent of foreign affiliates are developed countries with whom the United States has a long-standing relationship: more than a quarter of the foreign affiliates are located in either Canada or the United Kingdom. Twenty-three countries represent at least 1 percent of the final sample of foreign affiliates; the final sample spans 115 countries in total.

Variable measurement

Buyer/seller

The BEA data contain information on the dollar amount and direction of intrafirm trade in goods between the U.S. parent and its foreign affiliates. To capture firms that have meaningful income tax and customs duty incentives when setting transfer prices, our analysis focuses exclusively on a sample of foreign affiliates that engage in intrafirm trade in goods with their U.S. parent. We delete affiliates that do not trade in goods with their U.S. parent.

While most affiliates either buy from or sell to their U.S. parent, some do both. The combined income tax and duty transfer pricing incentives for these affiliates are ambiguous (i.e., import transactions will conflict, whereas export transactions will not, or vice versa). We classify an affiliate as a buyer (i.e., *Buyer* set equal to one) if imports from its U.S. parent are more than twice the exports to its U.S. parent. Alternatively, we classify an affiliate that primarily sells goods to its U.S. parent as a seller (i.e., *Seller* equals one) if exports from its U.S. parent are more than twice the imports from its U.S. parent. We delete affiliates where trade is not significantly larger in one direction because in these cases we cannot identify the direction of the conflict.

13. For example, duty rates on sweaters imported into the United States are determined by their material: acrylic or synthetics 32.5 percent, cotton 17.1 percent, cashmere 4.4 percent, silk 1.4 percent.

14. The court ultimately ruled that mutants were not human.

Income tax transfer pricing incentives (ITPI)

The standard measure of income tax transfer pricing (*ITPI*) incentives in the literature is the income tax rate differential between two affiliates in different jurisdictions. Mills and Newberry (2004) find that the difference between the U.S. statutory tax rate and the foreign effective tax rate relates more to measures of tax planning than does the difference between the United States and foreign statutory rates. We thus measure *ITPI* as the difference between the foreign effective tax rate and the U.S. statutory tax rate ($t_f - t_{US}$), consistent with recent transfer pricing literature including Klassen and LaPlante (2012a,b).¹⁵ Specifically, t_f is the ratio of foreign affiliate income tax expense to the foreign affiliate pre-tax income and t_{US} is the maximum corporate statutory rate in effect each year of our sample period.¹⁶ ¹⁷ If $t_f > t_{US}$, then *ITPI* > 0 and we set *High-Income-Tax*, which we use in the next section to identify conflicting incentives, equal to one.

Conflicting transfer pricing incentives (Conflict)

Transfer pricing incentives conflict for high-income-tax buyers (see Figure 1). They will also conflict for their low-income-tax trading partners that expect to receive shifted income in order to minimize worldwide income tax.¹⁸ Accordingly, to identify the subsample of affiliates that have conflicting incentives, we set *Conflict* equal to one either when both *Buyer* and *High-Income-Tax* are equal to one or when both *Buyer* and *High-Income-Tax* are equal to zero. Thus, *Conflict* equals one suggests that the affiliate is involved in trade with its U.S. parent and that minimizing duties and minimizing income taxes will require differing prices.

Because coordination has a greater potential to influence transfer prices when the conflict is strong, we create three additional indicator variables. *Conflict25*, *Conflict50*, and *Conflict75* equal one if *Conflict* is equal to one and the duty incentive is greater than 25, 50, and 75 percent, respectively, of the income tax transfer pricing incentive. Because duties are levied on gross price while income taxes are levied on net profit, we expect that duty incentives exceeding 25 percent of the income tax rate differential represent a significant cost.

We proxy for the duty incentive using the after-income tax average duty rate in each country-year reported by the World Bank (*Duty*). Recall that because duties are deductible for income tax purposes, the actual cost of paying a dollar of duty is $(1 - t)$. For affiliate sellers—foreign affiliates selling goods to the U.S. parent—we measure the expected after-income tax duty rate on shifted income as $Duty_{US} \times (1 - t_{US})$. For affiliate buyers—foreign affiliates buying goods from the U.S. parent—the expected after-income tax duty rate on shifted income equals $Duty_f \times (1 - t_f)$.¹⁹ Our *Duty* variable is only a proxy for the

15. We measure income tax rates and pre-tax income at the entity level rather than at the firm level. Owing to different reporting thresholds, few entities exist over a long period of time. Additionally, income tax expense is not collected in every survey. For these various reasons, it is not possible for us to construct a multiple-period income tax incentive measure as in Klassen and LaPlante (2012a).

16. If $t_f < 0$ or $t_f > 1$, we set t_f equal to the statutory tax rate in the affiliate's country-year. Our results are not sensitive to bounding t_f for these affiliates at zero and one, or deleting them from the sample. These observations represent 2.3 percent of our total sample.

17. The BEA data do not capture U.S. income tax expense for domestic operations in 10 of the years in our sample period. When available, the mean and median U.S. effective tax rate calculated from BEA data approximate the U.S. statutory rate, and the use of calculated U.S. rates, when available, do not change our inferences.

18. Though only buyers pay duties, related sellers should also prefer a low price to minimize firm-level duties.

19. We measure the duty incentive net of the income tax benefit because duties are deductible for income tax purposes, and the tax benefit from the deduction reduces the burden of the duty. The income tax rate that we use to measure the income tax benefit recognizes that the duty is deductible in the country of the buyer.

actual duty incentive because we cannot observe the actual products being bought or sold, nor can we observe product-specific duty rates.²⁰ Figure 2 provides numeric examples of the calculation of the *Conflict* variables and shows that more significant conflict occurs in jurisdictions with either a high duty rate or a high foreign tax rate because the ratio of the incentives increases as the duty increases or as *ITPI* decreases.²¹ To provide an example consistent with the mean conflicted affiliate in our sample, the U.S. parent is a low-tax seller in the first three columns of Figure 2.

By requiring that our duty incentive proxy equals or exceeds a specific percentage of our measure of the income tax incentive in defining the conflict subsamples we test, we capture cases where firms anticipate a nontrivial increase in their duty payment when reducing income taxes through transfer pricing. Thus, duty rates are increasing in the magnitude of the income tax differential in our “conflict” sample.

Coordination

Governmental-Level (*Gov’t-Coordination*) We rely on two measures of governmental coordination from OECD (2006, 2009). *One_Authority* and *One_Audit* represent whether the governments’ monitoring of firms’ income tax returns and customs duty declarations is relatively more coordinated.²² *One_Authority* is equal to one when a country has formally aligned its income tax and customs administrators under a single management structure. *One_Audit* is equal to one when integrated audits of taxpayers are the primary organization model for tax audits, as opposed to separate audits by tax type. *One_Authority* captures formal integration (e.g., organizational structure), while *One_Audit* captures informal integration (i.e., organizational processes). We classify each country as integrated or not for the entire sample period, using data collected shortly after the end of our sample period. Because the policy question of whether to integrate enforcement only increased in intensity in recent years (Yasui 2009), we believe our method of classifying countries is sound.

Corporate-Level (*Corp-Coordination*) It is difficult to measure the extent to which firms coordinate the income tax and customs functions, so we rely on multiple affiliate-level and firm-level proxies for corporate coordination. Consistent with Halperin and Srinidhi (1991), centralized decision-making facilitates coordination of competing objectives within the firm. For example, in our setting, managing the conflict between duty and income tax incentives can involve coordinating with related affiliates or even moving the pricing decision out of the trading affiliates. We draw two affiliate-level proxies for centralized decision making from Robinson and Stocken (2013), who find evidence consistent with affiliates using the U.S. dollar functional currency having relatively less autonomy (i.e.,

20. Pierce and Schott (2009) report more than 20,000 classifications for goods imported into the United States, each with a different duty rate. This large number of classifications is common. The World Bank calculates “average” duty rates for a country-year by weighting duty rates in effect by a normal basket of goods imported into that country. While the normal basket may not correspond with the basket of traded goods in our sample of affiliates, we expect they are highly correlated. We also recognize that duty rates are bilateral in nature if trade agreements reduce or eliminate the rate on imports from certain countries. An important trade agreement is the North American Free Trade Agreement (NAFTA), which phases out duty rates on trade occurring between the United States, Canada, and Mexico over a 15-year period beginning in 1995. Although we cannot identify the effect of NAFTA on our sample specifically, we set *Duty* equal to zero for trade occurring between these countries after 1995, and our results are not materially affected.

21. *ITPI* decreasing implies that the income tax rates of the buyer and the seller become more similar.

22. We characterize the tax administration variables in reference to the country of import rather than the country of the export in order to characterize the appropriate side of the transaction for which we expect tax administration to matter. Thus, the tax administration variables are set to the U.S. values for all foreign affiliates that sell to the U.S. parent (because the U.S. parent is the buyer) and are set to the values applicable to the affiliate’s country of location for all foreign affiliates that buy from the U.S. parent.

Figure 2 Calculation of conflict

| | Buyer is high-income-tax ($t_f > t_{US}$) | Buyer is high-income-tax ($t_f > t_{US}$) | Buyer is high-income-tax ($t_f > t_{US}$) | Buyer is low-income-tax ($t_f < t_{US}$) |
|--|--|--|--|---|
| t_f | 0.50 | 0.40 | 0.36 | 0.30 |
| t_{US} | 0.35 | 0.35 | 0.35 | 0.35 |
| <i>ITPI</i> | 0.15 | 0.05 | 0.01 | -0.05 |
| Highest <i>Conflict</i> variable if $d = 0.05$ | <i>Conflict</i> | <i>Conflict50</i> | <i>Conflict75</i> | N/A |
| After-tax d if $d = 0.05$ | 0.025 | 0.03 | 0.032 | N/A |
| Highest <i>Conflict</i> variable if $d = 0.01$ | <i>Conflict</i> | <i>Conflict</i> | <i>Conflict50</i> | N/A |
| After-tax d if $d = 0.01$ | 0.005 | 0.006 | 0.0064 | N/A |

Notes: Figure 2 assumes that the foreign affiliate is the buyer and the U.S. parent is the seller, and provides examples of t_f (t_b), t_{US} (t_s), and d that will give rise to conflicting income tax and duty minimization incentives. *ITPI* measures the income tax transfer pricing incentive and is equal to $(t_f - t_{US})$. Highest *Conflict* variable refers to the most stringent definition of *Conflict* that is met using the example rates in the column. *Conflict* equals one for affiliates in quadrant (I) of Figure 1 (or, when the buyer is high-income-tax or the seller is low-income-tax). *Conflict25*, *Conflict50*, and *Conflict75* equal one if *Conflict* equals one and after-tax d is greater than 25, 50, and 75 percent, respectively, of the absolute value of *ITPI*. Because duties are deductible by the payer for income tax purposes, after-tax d is net of the income tax rate in the country of the buyer: t_f in the examples here.

decision rights are primarily located in the U.S. headquarters). They also find that U.S. expatriates are more prevalent in these affiliates. *Centralized* and *Expatriate* are indicator variables equal to one if the affiliate uses the U.S. dollar as its functional currency or employs a U.S. expatriate, respectively.²³

We also identify three firm-level proxies for the likely extent of coordination between the income tax and duty function within an organization: *Private*, *TradeDum*, and *SizeDum*. *Private* is equal to one when the firm's equity is privately owned. Armstrong et al. (2012) and Robinson et al. (2010) find that tax departments of public companies are rewarded for lowering the firm's effective tax rate (ETR). Although 66.1 percent of public-firm tax executive respondents selected the ETR as a measure used by management to evaluate the tax department, only 40.3 percent of private-firm respondents selected ETR, suggesting that public firms are more likely to focus on the ETR than private firms (TEI 2005). Responses to this same survey indicated a similar level of focus on cash taxes paid, with 53.0 percent of public-firm and 51.9 percent of private-firm respondents selecting cash taxes as a measure used for performance evaluation. Income tax-motivated transfer pricing is one mechanism to reduce ETRs. Customs duties are not included in the numerator of ETR, so duty minimization does not decrease the ETR as significantly as income tax minimization does. Because private firms likely place less focus on the ETR and more on cash taxes paid, they should be more likely to coordinate the duties and income tax function.

23. The data do not reveal whether the expatriate is a manager or lower-level employee. However, due to the cost of employing an expatriate at a foreign affiliate, it is common practice for MNCs to employ expatriates in foreign affiliates for managerial roles.

TradeDum is motivated by our expectation that when international trade is relatively significant to the firm as a whole, the firm will be more likely to coordinate its income tax and duty function. Thus, *TradeDum* equals one if either the ratio of total U.S. exports to total U.S. sales (i.e., *Pct_Export*) or the ratio of total U.S. imports to total U.S. sales (i.e., *Pct_Import*) is above the median of the sample distribution. *SizeDum* is motivated by our expectation that it is more difficult for larger MNCs to coordinate the income tax and customs functions. Consistent with this conjecture, TEI (2005) reports that a significantly greater proportion of smaller firms incorporate the income tax function into the firm's Enterprise Resource Planning system, which would also be used by the customs function. *SizeDum* equals one if *logFirmAssets*, the natural log of firm total assets, is below the sample median.

Other variables

As described in section 5, we rely on Hines and Rice (1994), who outline a model to detect income tax-motivated transfer pricing in affiliate-level or country-level data. In their model, the natural log of pre-tax profitability, *logPTI*, is expressed as a function of the natural log of real input measures—total assets, *logAssets*, and total employee compensation, *logComp*. We control for cross-country differences in technology or factor qualities that may affect productivity by including the natural log of gross domestic product, *logGDP*.

Descriptive statistics

Table 2 provides descriptive statistics for our sample and regression variables. The median foreign affiliate in our sample reports pre-tax income, assets, and compensation of \$4.4, \$37.4, and \$6.6 million, respectively, and is located in a relatively developed country (median *GDP* of \$550 billion). The mean value of *ITPI* is -0.023 , suggesting that the average income tax transfer pricing incentive in our sample is to shift income out of the United States and into a low-income-tax foreign affiliate. However, 45 percent of our sample represents annual observations where affiliates are considered high-income-tax relative to their U.S. parent. While this percentage may seem large given the statutory tax rates in effect today, the United States was relatively low-income-tax in the 1980s when statutory tax rates in much of the world were higher.²⁴ We observe a nearly monotonic downward trend in relative tax rates in our data beginning in the late 1980s: 65.6 percent of the sample is high-income-tax relative to the United States in 1988, but the percentage decreases to 29.7 by 2005.

The mean value of *Conflict* is 0.499 indicating that half of the affiliates in our sample have conflicting transfer pricing incentives. We also partition our sample by the extent of the conflict. Mean values of *Conflict25*, *Conflict50*, and *Conflict75* indicate that 32, 23, and 18 percent, respectively, of sample affiliates with duty rates exceeding 25, 50, and 75 percent of their income tax transfer pricing incentives (*ITPI*). As illustrated in Figure 2, our measures of conflict consider the level of *Duty* relative to *ITPI*, so an affiliate with *Conflict25* = 1 does not necessarily have a high absolute customs duty but rather a high customs duty relative to the income tax differential. For example, the median *Duty* (*ITPI*) for affiliates where *Conflict25* = 1 is 4.7 percent (3.8 percent), while the median *Duty* (*ITPI*) for affiliates where *Conflict75* = 1 is 5.2 percent (2.2 percent), respectively. The average duty rate in our sample is 5.3 percent.

24. Despite the low foreign tax rates in effect today, relative to the United States, our study generalizes to international trade occurring between any two countries facing different income tax rates, not just the United States and foreign countries, to which our data set restricts our attention.

TABLE 2
Descriptive statistics: Full sample

| Variable | <i>N</i> | Mean | Median | Std. Dev. | P25 | P75 |
|-------------------------|----------|---------|---------|-----------|---------|-----------|
| Indicator variables | | | | | | |
| <i>Buyer</i> | 55,893 | 0.773 | | | | |
| <i>High-Income-Tax</i> | 55,893 | 0.454 | | | | |
| <i>Conflict</i> | 55,893 | 0.499 | | | | |
| <i>Conflict25</i> | 55,893 | 0.323 | | | | |
| <i>Conflict50</i> | 55,893 | 0.232 | | | | |
| <i>Conflict75</i> | 55,893 | 0.179 | | | | |
| <i>One_Authority</i> | 50,514 | 0.286 | | | | |
| <i>One_Audit</i> | 50,514 | 0.620 | | | | |
| <i>Private</i> | 55,893 | 0.168 | | | | |
| <i>Centralized</i> | 55,893 | 0.222 | | | | |
| <i>Expat</i> | 55,893 | 0.832 | | | | |
| <i>TradeDum</i> | 55,893 | 0.355 | | | | |
| <i>SizeDum</i> | 55,893 | 0.500 | | | | |
| Continuous variables | | | | | | |
| <i>t_f</i> | 55,893 | 0.345 | 0.350 | 0.174 | 0.244 | 0.445 |
| <i>Duty</i> | 55,893 | 0.053 | 0.042 | 0.050 | 0.027 | 0.060 |
| <i>ITPI</i> | 55,893 | -0.023 | -0.010 | 0.174 | -0.124 | 0.070 |
| <i>logPTI</i> | 55,893 | 8.404 | 8.392 | 1.727 | 7.344 | 9.481 |
| <i>logAssets</i> | 55,893 | 10.650 | 10.530 | 1.491 | 9.576 | 11.596 |
| <i>logComp</i> | 55,893 | 8.723 | 8.789 | 1.768 | 7.810 | 9.792 |
| <i>logGDP</i> | 55,893 | 19.894 | 20.126 | 1.205 | 19.071 | 20.772 |
| <i>logFirmAssets</i> | 55,893 | 14.829 | 14.936 | 1.809 | 13.682 | 16.040 |
| <i>Pct_Export</i> | 55,893 | 0.148 | 0.121 | 0.139 | 0.052 | 0.199 |
| <i>Pct_Import</i> | 55,893 | 0.065 | 0.032 | 0.100 | 0.005 | 0.082 |
| Descriptive information | | | | | | |
| <i>PTI</i> | 55,893 | 21,247 | 4,411 | 87,687 | 1,548 | 13,114 |
| <i>Assets</i> | 55,893 | 158,131 | 37,403 | 592,971 | 14,421 | 108,729 |
| <i>Compensation</i> | 55,893 | 21,716 | 6,561 | 77,986 | 2,466 | 17,904 |
| <i>GDP</i> | 55,893 | 751,436 | 550,122 | 730,989 | 191,643 | 1,049,903 |

Notes: Continuous variables in their unlogged form are presented in thousands, except *GDP* which is presented in millions. See the Appendix for variable definitions.

Our measures of *Gov't-Coordination* indicate that approximately 29 percent of the sample has formal integration of the trade and income tax authorities (*One_Authority*), while 62 percent have informal integration through the audit process (*One_Audit*). There is a significant negative correlation between *One_Authority* and *One_Audit* (-0.41 , $p < 0.01$), which suggests that these types of governmental coordination are substitutes rather than complements.

Consistent with a significant amount of autonomy granted to foreign affiliates, 22 percent use the U.S. dollar as their functional currency (*Centralized*), and 83 percent employ a U.S. expatriate (*Expat*). Approximately 17 percent of our affiliates are owned by private U.S. parents. Untabulated correlations show that although the five measures of corporate-level control are generally significantly correlated, the correlations are small. Only the correlation between *Private* and *SizeDum*, at 0.21, $p < 0.01$, exceed $|0.10|$. Thus, the various measures of *Corp-Coordination* capture slightly different aspects of corporate-level coordination.

5. Baseline research design and results

To provide initial evidence in our sample consistent with the extant literature on income tax transfer pricing, we estimate a model developed by Hines and Rice (1994) and used in numerous studies (most recently, Huizinga and Laeven 2008; Markle 2015). Specifically, we estimate foreign affiliate-level OLS regressions of equation (1) as follows:

$$\log PTI = \beta_0 + \beta_1 ITPI + \beta_2 \log Assets + \beta_3 \log Comp + \beta_4 \log GDP + Industry + Year + \varepsilon_1, \quad (1)$$

where $\log PTI$ is the natural log of affiliate pre-tax income,²⁵ $ITPI$ is the income tax transfer pricing incentive equal to $(t_f - t_{US})$, $\log Assets$ is the natural log of affiliate total assets,²⁶ $\log Comp$ is the natural log of affiliate total employee compensation, and $\log GDP$ is the natural log of gross domestic income of the affiliate’s country. Table 3 presents these results.

A negative coefficient on β_1 is consistent with income tax-motivated transfer pricing (i.e., higher than expected profitability in low-income-tax countries and lower than expected profitability in high-income-tax countries). In column (1) we report a β_1 of -0.542 , consistent with the prior literature including Huizinga and Laeven (2008) who report a coefficient of -0.595 in a similar specification. This implies that decreasing the foreign tax rate by 1 percent, *ceteris paribus*, raises foreign affiliate profitability by 0.54 percent.²⁷ Interpreting our estimate at the sample mean $ITPI$ of -0.023 implies an income tax savings of 0.02 percent of foreign affiliate pre-tax income (0.54×-0.033) on a foreign tax rate decrease of 1 percent.

The coefficient on $\log GDP$ reflects the *net* effect of economic development on profitability. For instance, higher profitability might materialize in developed countries because of more advanced technology, or alternatively, profitability could be negatively impacted if firms require higher returns in less developed countries to compensate for risks associated with less effective property rights and regulations. As in Huizinga and Laeven (2008), $\log GDP$ enters the regression negatively, suggesting that the latter effect is stronger.

We next incorporate the presence of conflicting transfer pricing incentives into equation (1) to determine whether there is an interaction effect between $ITPI$ and our measure of conflict. If affiliates report consistent prices to both the income tax and customs authorities, then the negative relation between pre-tax income and $ITPI$ in the full sample will be attenuated in the sample where income tax and duty minimization incentives conflict (i.e., $Conflict = 1$).

25. While gross margin may more directly capture fluctuation in profits due to transfer prices set on intrafirm trade, the BEA data do not provide sufficient income statement detail to measure gross margin. Thus, we follow prior literature in using pre-tax income.

26. The proxy for capital used in Hines and Rice (1994) is fixed assets, rather than total assets. However, we use total assets because this variable is reported more consistently than fixed assets in our data, allowing us to use a larger sample and longer time period. Inferences obtained from estimating equation (1) are unchanged when we substitute fixed assets for total assets, using a smaller sample.

27. When we estimate equation (1) in the sample of 77,855 affiliates we drop from our study because they do not engage in intrafirm trade in goods with their U.S. parent (see Table 1), the coefficient on $ITPI$ is -0.936 ($p < 0.01$). This implies a sensitivity of income to tax rates nearly twice that observed in our sample. We conjecture that our sample appears to have relatively limited opportunities to shift income as compared to firms with higher levels of “migratory” intangibles. Prior research that includes such affiliates also estimate larger coefficients on the income tax incentive variable; for example, Hines and Rice (1994) estimate a coefficient of -2.83 in a sample including many tax haven affiliates. Our sample is constructed based on our desire to focus on the optimization problem introduced by conflicting incentives created by different taxes and the role of coordination in tax minimization.

TABLE 3
Ordinary least square regressions of foreign affiliate profitability on transfer pricing incentives

| Dependent variable = $\log PTI$ | | | | | |
|---------------------------------|----------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| | Predicted sign | (1) Baseline | (2) <i>Conflict25</i> | (3) <i>Conflict50</i> | (4) <i>Conflict75</i> |
| $\beta_1 ITPI$ | – | –0.5424*** (0.0490) | –0.6792*** (0.0534) | –0.5954*** (0.0502) | –0.5691*** (0.0497) |
| $\beta_2 Conflict$ | | | 0.0572*** (0.0144) | 0.0159 (0.0166) | –0.0035 (0.0187) |
| $\beta_3 Conflict \times ITPI$ | + | | 1.3576*** (0.1628) | 1.6450*** (0.2611) | 1.8043*** (0.3733) |
| $\beta_4 \log Assets$ | + | 0.8433*** (0.0149) | 0.8481*** (0.0148) | 0.8457*** (0.0149) | 0.8446*** (0.0149) |
| $\beta_5 \log Comp$ | + | 0.0522*** (0.0128) | 0.0512*** (0.1274) | 0.0518*** (0.0128) | 0.0521*** (0.0128) |
| $\beta_6 \log GDP$ | – | –0.0618*** (0.0090) | –0.0605*** (0.0089) | –0.0602*** (0.0089) | –0.0604*** (0.0089) |
| $\beta_0 Intercept$ | | 0.3005 (0.2991) | 0.2148 (0.2980) | 0.2378 (0.2986) | 0.2555 (0.2992) |
| Year fixed effects | | Yes | Yes | Yes | Yes |
| Industry fixed effects | | Yes | Yes | Yes | Yes |
| R^2 | | 0.6040 | 0.6056 | 0.6047 | 0.6044 |
| Conflict N | | | 18,033 | 12,999 | 10,035 |
| Sample N | | 55,893 | 55,893 | 55,893 | 55,893 |

Notes: *** denotes significance at the 1 percent two-tailed level. We estimate affiliate-level OLS regressions and report robust standard errors, clustered by firm, in parentheses. See the Appendix for variable definitions. Bold denotes variables of interest.

Specifically, we estimate affiliate-level OLS regressions of equation (2) as follows:

$$\log PTI = \beta_0 + \beta_1 ITPI + \beta_2 Conflict + \beta_3 Conflict \times ITPI + \beta_4 \log Assets + \beta_5 \log Comp + \beta_6 \log GDP + Industry + Year + \varepsilon_2, \quad (2)$$

where *Conflict* equals one if transfer pricing incentives created by income taxes and customs duties conflict, and zero otherwise (i.e., *Conflict25*, *Conflict50*, *Conflict75*). All other variables are as defined above for equation (1).²⁸

Table 3, columns (2) through (4), report results from estimating equation (2). In all cases, we continue to observe a negative relation between pre-tax income and *ITPI* in the non-conflict sample ($\beta_1 < 0$; $p < 0.01$). However, we estimate a positive relation between pre-tax income and *ITPI* for the conflict sample ($\beta_1 + \beta_3 > 0$; $p < 0.01$) that is increasing as the strength of the conflict increases ($\beta_1 + \beta_3$ increases from column (2) to column (4)). This overall positive relation implies lower than expected profitability in low-income-tax countries and higher than expected profitability in high-income-tax countries and is consistent with duty minimization objectives having a greater influence on firms' transfer prices than income tax minimization objectives. Because we define a conflict only when duty

28. Consistent with Saunders-Scott (2015), who develops a model to illustrate fixed costs to profit shifting should limit within-firm variation, we do not include firm fixed effects in the model. In untabulated results, we re-estimate equation (2), including firm indicators. Inferences are unchanged.

rates exceed a specified percentage of the income tax differential, higher values of *ITPI* will also have higher duty rates, making the duty rate at least as salient.

In economic terms, results in column (2) of Table 3 suggest that a 1 percent decrease in *ITPI* for the average conflicted firm (which equates to a 1 percent decrease in the rate of the foreign affiliate or a 1 percent increase in the U.S. rate) would result in a 0.681 percent decrease in reported profit. For firms without a conflict, we estimate that a 1 percent decrease in *ITPI* increases reported profit by 0.677 percent. Using the average *logPTI* reported for each group to calculate an effect in dollars, we estimate that an *ITPI* decrease of 1 percent induces a conflicted firm to report \$25k less profit, while a not conflicted firm reports \$33k additional profit.

Untabulated results indicate that when a conflict exists but the duty incentive is relatively small, duty minimization matters but income tax-motivated transfer pricing behavior appears to dominate. For instance, the coefficient on *Conflict*×*ITPI* in equation (2) is positive and significant if we set *Conflict* equal to one when *Duty* exceeds 2 percent of *ITPI*, but the magnitude of the coefficient is smaller ($\beta_3 = 0.165$) and the overall slope on *ITPI* ($-0.872 + 0.165$) for the conflict observations remains negative and significant ($\beta_1 + \beta_3 < 0$; $p < 0.01$). Thus, duty minimization still decreases an MNC’s income tax-motivated transfer pricing behavior when the duty incentives are conflicting and small, but duty minimization dominates only when the expected duty payments relative to income tax savings are significant.

We tabulate results using *Conflict25*, *Conflict50*, and *Conflict75* to highlight the slope difference on *ITPI* as the transfer pricing conflict becomes more substantial.²⁹ We use *Conflict25* to test Hypotheses 1 and 2 to ensure that *Conflict* identifies a subsample for which customs duties are likely to be a salient consideration in transfer pricing decisions while maintaining a sufficient sample size to estimate three-way interactions. Overall, these baseline results establish that MNCs with large duty rates (relative to the income tax differential) significantly alter the prices they would otherwise set to minimize income taxes, in the presence of conflicting incentives. We next turn to the role of coordination in the transfer pricing behavior of these MNCs.

6. Role of coordination on conflicting transfer pricing incentives

Empirical specification

Our hypotheses predict that MNCs with conflicting transfer pricing incentives will focus less on income tax minimization when there is relatively greater coordination in governments’ or firms’ income tax and customs functions. Equation (3) introduces *Coordination* into equation (2), and tests for an interaction effect on *Conflict*×*ITPI* (i.e., a three-way interaction). In robustness tests, we also estimate a fully interacted model that allows each of our independent variables to vary by *Coordination*.

$$\begin{aligned}
 \log PTI = & \beta_0 + \beta_1 ITPI + \beta_2 Conflict + \beta_3 Conflict \times ITPI + \beta_4 Coordination \\
 & + \beta_5 ITPI \times Coordination + \beta_6 Conflict \times Coordination \\
 & + \beta_7 Conflict \times ITPI \times Coordination + \beta_8 \log Assets + \beta_9 \log Comp \\
 & + \beta_{10} \log GDP + Industry + Year + \epsilon_3,
 \end{aligned}
 \tag{3}$$

29. We also estimate equation (2) using a continuous measure, whereby *Conflict* is equal to the ratio of the duty rate to the absolute value of *ITPI* for conflict observations. The estimated coefficient on *ITPI* is -0.694 ($p < 0.01$), and the coefficient on the interaction term is 1.799 ($p < 0.01$). However, we rely on a dichotomous measure of *Conflict* as our hypotheses tests require three-way interactions. A binary variable makes those results easier to interpret, particularly since we estimate our regressions in natural log.

TABLE 4

Ordinary least square regressions of foreign affiliate profitability on transfer pricing incentives and governmental coordination

| Dependent variable = $\log PTI$ | | | |
|---|----------------|---------------------------------------|---------------------------------------|
| | Predicted sign | (1) <i>One_Authority</i> | (2) <i>One_Audit</i> |
| $\beta_1 ITPI$ | – | – 0.6328*** (0.0670) | – 0.5440*** (0.0650) |
| $\beta_2 Conflict25$ | | 0.0551*** (0.0160) | 0.0103 (0.0270) |
| $\beta_3 Conflict25 \times ITPI$ | + | 1.4391*** (0.1976) | 0.9526*** (0.3081) |
| $\beta_4 Gov't\text{-}Coordination$ | | –0.0533*** (0.1989) | –0.0111 (0.0215) |
| $\beta_5 ITPI \times Gov't\text{-}Coordination$ | | –0.2629*** (0.0927) | –0.2224** (0.0878) |
| $\beta_6 Conflict25 \times Gov't\text{-}Coordination$ | | 0.0289 (0.0337) | 0.0860*** (0.0323) |
| $\beta_7 Conflict25 \times ITPI \times Gov't\text{-}Coordination$ | + | 0.8099** (0.3446) | 1.0397*** (0.3608) |
| $\beta_8 \log Assets$ | + | 0.8531*** (0.0149) | 0.8538*** (0.0150) |
| $\beta_9 \log Comp$ | + | 0.0480*** (0.0128) | 0.0478*** (0.0127) |
| $\beta_{10} \log GDP$ | – | –0.0492*** (0.0093) | –0.0509*** (0.0094) |
| $\beta_0 Intercept$ | | 0.0550 (0.2688) | 0.0805 (0.2691) |
| Year fixed effects | | Yes | Yes |
| Industry fixed effects | | Yes | Yes |
| R^2 | | 0.6128 | 0.6047 |
| Sample N | | 50,514 | 50,514 |

Notes: ** and *** denote significance at the 5 percent and 1 percent two-tailed levels, respectively. We estimate affiliate-level OLS regressions and report robust standard errors, clustered by firm, in parentheses. Column (1) reports results using *One_Authority* as our measure of *Gov't-Coordination*. Column (2) reports results using *One_Audit* as our measure of *Gov't-Coordination*. See the Appendix for variable definitions. Bold denotes variables of interest.

where *Coordination* equals one if the affiliate has a coordinated governmental authority (*One_Authority* and *One_Audit*) or if the affiliate is more likely to be coordinated with its U.S. parent (*Centralized*, *Expat*, *Private*, *TradeDum*, and *SizeDum*), and zero otherwise. All other variables are as defined above for equations (1) and (2).³⁰

Results reported in Table 3 suggest that firms decrease the use of transfer prices that focus on income tax minimization in the presence of conflicting incentives. This initial evidence assumes that all MNCs have similar levels of internal coordination and have equal enforcement. However, we expect that MNCs with conflicting incentives are more likely to report consistent transfer prices when they have coordinated income tax and customs

30. We estimate equation (3) with firm indicators in untabulated results. Inferences in Tables 4 and 5 are unchanged.

TABLE 5
Ordinary least square regressions of foreign affiliate profitability on transfer pricing incentives and corporate coordination

| Dependent variable = <i>logPTI</i> | Predicted sign | (1) <i>Centralized</i> | (2) <i>Expat</i> | (3) <i>Private</i> | (4) <i>TradeDum</i> | (5) <i>SizeDum</i> |
|---|----------------|---------------------------|------------------------|------------------------|------------------------|------------------------|
| $\beta_1 ITPI$ | - | -0.7155*** (0.0495) | -0.3897*** (0.1209) | -0.6832*** (0.0576) | -0.5047*** (0.0576) | -0.6669*** (0.0824) |
| $\beta_2 Conflict25$ | | 0.0759*** (0.0158) | 0.0588* (0.0331) | 0.0573*** (0.0158) | 0.0885** (0.0169) | 0.0267 (0.0220) |
| $\beta_3 Conflict25 \times ITPI$ | + | 1.1738*** (0.1760) | 0.8028*** (0.3018) | 1.2027*** (0.1687) | 1.0199*** (0.1665) | 0.8888*** (0.2463) |
| $\beta_4 Corp-Coordination$ | | 0.0590** (0.0241) | -0.1374*** (0.0298) | -0.1649*** (0.0401) | -0.0094 (0.0389) | -0.1283*** (0.0326) |
| $\beta_5 ITPI \times Corp-Coordination$ | | 0.1465 (0.1049) | -0.3538*** (0.1190) | 0.0535 (0.1087) | -0.4640*** (0.0828) | -0.0304 (0.0959) |
| $\beta_6 Conflict25 \times Corp-Coordination$ | | -0.0769** (0.0333) | -0.0009 (0.0337) | 0.0048 (0.0330) | -0.0933*** (0.0270) | 0.0587** (0.0285) |
| $\beta_7 Conflict25 \times ITPI \times Corp-Coordination$ | + | 0.5483* (0.2992) | 0.6599** (0.3260) | 0.8605** (0.3987) | 0.7933*** (0.2800) | 0.8619*** (0.3104) |
| $\beta_8 logAssets$ | + | 0.8468*** (0.0148) | 0.8382*** (0.0151) | 0.8443*** (0.0145) | 0.8486*** (0.1494) | 0.8369*** (0.1455) |
| $\beta_9 logComp$ | + | 0.0522*** (0.0128) | 0.0479*** (0.0128) | 0.0494*** (0.0125) | 0.0509*** (0.0128) | 0.0510*** (0.0125) |
| $\beta_{10} logGDP$ | - | -0.0588*** (0.0088) | -0.0588*** (0.0087) | -0.0584*** (0.0088) | -0.0607*** (0.0088) | -0.0550*** (0.0087) |

(The table is continued on the next page.)

TABLE 5 (continued)

| | (1) <i>Centralized</i> | (2) <i>Expat</i> | (3) <i>Private</i> | (4) <i>TradeDum</i> | (5) <i>SizeDum</i> |
|------------------------|---------------------------|---------------------|-----------------------|------------------------|-----------------------|
| β_0 Intercept | 0.1719 (0.2970) | 0.4645 (0.3105) | 0.4273 (0.3024) | 0.2186 (0.2937) | 0.2878 (0.2896) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes |
| R^2 | 0.6058 | 0.6064 | 0.6067 | 0.6063 | 0.6065 |
| Sample <i>N</i> | 55,893 | 55,893 | 55,893 | 55,893 | 55,893 |

Notes: *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent two-tailed levels, respectively. We estimate affiliate-level OLS regressions and report robust standard errors, clustered by firm, in parentheses. Column (1) reports results using *Centralized* as our measure of *Corp-Coordination*. Column (2) reports results using *Expat* as our measure of *Corp-Coordination*. Column (3) reports results using *Private* as our measure of *Corp-Coordination*. Column (4) reports results using *TradeDum* as our measure of *Corp-Coordination*. Column (5) reports results using *SizeDum* as our measure of *Corp-Coordination*. See the Appendix for variable definitions. Bold denotes variables of interest.

enforcement. Hypothesis 1 then predicts that in the presence of conflicting incentives, this coordination could further decrease the use of transfer prices that focus on income tax minimization. Thus, we estimate equation (3) using measures of governmental coordination; a positive coefficient on β_7 is consistent with Hypothesis 1.

We next consider a separate channel through which coordination may influence transfer prices. Here, we relax the assumption that all MNCs have similarly coordinated income tax and customs functions and argue that relatively more coordination is associated with a greater likelihood that MNCs minimize the aggregate tax burden (i.e., the sum of income taxes and duties). Hypothesis 2 then predicts that in the presence of conflicting incentives, coordination could further decrease transfer pricing's link to income tax minimization. Thus, a positive coefficient on β_7 when using proxies for corporate coordination to capture *Coordination* in equation (3) is consistent with Hypothesis 2.

Hypothesis 1: Result

Table 4 reports results from estimating equation (3) using our measures of *Gov't-Coordination*. In column (1), which uses *One_Authority*, we expect and find a positive coefficient on the three-way interaction term ($\beta_7 = 0.810$; $p < 0.0001$). This result suggests that affiliates with conflicting transfer pricing incentives further decrease (increase) their income tax (customs duty) transfer pricing behavior in the presence of government integration of income tax and customs enforcement. We estimate that, with a 1 percent decrease in *ITPI*, the effect of government integration on the average conflicted firm results in a reduction in reported profit of 0.55 percent relative to a conflicted firm without government integration.

Column (2) presents results using *One_Audit*. Again, we find a positive coefficient on β_7 .³¹ We estimate that a government with an integrated audit function induces a conflicted firm to report 0.82 percent less profit than a conflicted firm without an integrated audit function when both experience a 1 percent decrease in *ITPI*. Joint minimization of duties and income taxes is arguably more difficult for affiliates with conflicting transfer pricing incentives that also have integrated customs and income tax enforcement. Results presented in Table 4 support Hypothesis 1 and suggest that, in the presence of government coordination, affiliates with conflicting incentives increase their use of consistent transfer prices for income taxes and customs duties resulting in transfer prices that appear consistent with duty minimization.

Hypothesis 2: Result

Table 5 reports results from estimating equation (3) using our proxies for corporate coordination. Column (1) reports results using *Centralized*. We find a positive coefficient on the three-way interaction term ($\beta_7 = 0.548$; $p < 0.0001$). Columns (2) through (5) show a similar pattern using our other proxies.³² The economic effects of *Coordination* for a 1 percent decrease in *ITPI* estimated in Table 5 range from 0.31 percent less reported profit using *Expat* to 0.92 percent less reported profit using *Private*. Thus, results presented in Table 5 provide support for Hypothesis 2. That is, coordination of income tax and duty function within the MNC raises awareness of a transfer pricing conflict, and firms respond by decreasing (increasing) income tax-motivated (customs duty-motivated) transfer pricing

31. It is likely that when multiple taxes are audited simultaneously, trade tax and income tax authorities share information even if they are not formally integrated into one agency. However, to ensure that audits of simultaneous taxes are likely to include both income taxes and customs duties, we also estimate equation (3) using *One_Audit* on the subsample for which *One_Authority* = 1 and find the same result.

32. Results in both Tables 4 and 5 are robust to estimating a fully interacted model. Specifically, allowing the predictors of profitability (including year and industry fixed effects) to vary between affiliates where *Coordination* = 0 and affiliates where *Coordination* = 1 does not change inferences reported in Tables 4 or 5.

behavior suggests that coordination prevents MNCs from myopically establishing transfer prices that fixate on income tax minimization.

7. Supplemental analysis: Coordination and aggregate tax burden

We present evidence consistent with coordination within governments and coordination within firms influencing the transfer pricing behavior of firms that attempt to minimize the sum of income taxes and customs duties. This, in turn, suggests that coordination can influence the level of *total* taxes paid by the MNC. More specifically, our analyses imply that coordination within governments (firms) should *increase (decrease)* MNCs' aggregate tax burdens.

Because in these tests we are interested in MNC's aggregate tax burdens, rather than affiliate-level unexpected profit, we abandon the Cobb–Douglas specification employed in previous tests. Rather, to explore the relation between coordination and total taxes, we follow Robinson (2012) to define total taxes as income taxes plus other taxes, scaled by total assets. We also follow Robinson (2012) and specify MNCs' aggregate tax burdens as a function of firm characteristics that generate tax burdens, such as inventory and PP&E (which generates property taxes), imports (which generate duties), and profitability, the relative significance of foreign operations, and the weighted average consolidated statutory income tax rate (which generate income taxes). Finally, we include an MNC-level of conflict, defined as the percent of worldwide sales that are generated by conflicted foreign affiliates, to control for the level of MNC conflict.³³ Here, we incorporate the level of coordination that the foreign affiliates of the MNC have into the model. We present the results in Table 6.

The variables of interest in each regression are *Coordinated* and *Not Coordinated*. Depending on the specification, *Coordinated* reflects the proportion of MNCs' sales in its foreign affiliates that are either in jurisdictions with governmental coordination or are coordinated with their U.S. parent. *Not Coordinated* is the proportion of sales in foreign affiliates without these coordination attributes. In columns (1) and (2), *Coordinated* represents the proportion of sales where *One_Authority* or *One_Audit* are equal to one, respectively, while *Not Coordinated* represents the proportion of sales where *One_Authority* or *One_Audit* are equal to zero. In columns (3) and (4), *Coordinated* represents the proportion of sales where *Centralized* or *Expat* are equal to one, respectively, while *Not Coordinated* represents the proportion of sales where *Centralized* or *Expat* are equal to zero. The excluded group in all specifications represents domestic sales (for which there is no variation in the level of coordination) and affiliates for which we do not have measures of coordination.

We expect that U.S. MNCs with a relatively greater proportion of governmental coordination will have higher total tax burdens than U.S. MNCs with a relatively lower proportion of coordinated taxing authorities. Thus, we predict that the coefficient on *Coordinated* in columns (1) and (2) will be positive and significantly greater than the coefficient on *Not Coordinated*. Results are broadly consistent with expectations. In column (1), which specifies *Gov't-Coordination* as *One_Authority*, we estimate a coefficient on *Coordinated* that is both positive and significantly greater than the coefficient on *Not Coordinated* (F -test = 4.24.) In column (2), where *One_Audit* is our proxy for *Gov't-Coordination*, we estimate that the effect of *Coordinated* is positive but is not statistically more positive than the effect of *Not Coordinated* (F -test = 1.89.) These results suggest that the total tax burden of U.S. MNCs is higher when they have a higher percentage of coordinated foreign taxing authorities.

33. We do not interact our MNC-measure of conflict with our MNC-measure of coordination because the nature of the MNC-level analysis does not allow us to know whether the conflict and coordination are in the same affiliate. For example, an MNC might have 10 percent of its sales in conflicted affiliates and be coordinated with 20 percent of its foreign affiliates, but those sets of affiliates may be distinct and nonoverlapping.

TABLE 6

Ordinary least square regressions of U.S. MNC total taxes paid on governmental coordination or corporate coordination

Dependent variable = *Total Taxes Paid*

| | Predicted sign vs. <i>Not</i> <i>Coordinated</i> | (1) <i>One_</i> <i>Authority</i> | (2) <i>One_</i> <i>Audit</i> | Predicted sign vs. <i>Not</i> <i>Coordinated</i> | (3) <i>Centralized</i> | (4) <i>Expat</i> |
|--|---|--|------------------------------------|---|-----------------------------------|-----------------------------------|
| β_1 <i>Not</i> <i>Coordinated</i> | | 0.0176* (0.0091) | 0.0185** (0.0090) | | -0.0130 (0.0426) | -0.0091 (0.0488) |
| β_2 <i>Coordinated</i> | > | 0.0244*** (0.0091) | 0.0227** (0.0092) | < | -0.0278 (0.0431) | -0.0241 (0.0453) |
| β_3 <i>Inventory</i> | | 0.0428*** (0.0111) | 0.0426*** (0.0111) | | 0.0414*** (0.0111) | 0.0433*** (0.0111) |
| β_4 <i>PPE</i> | | 0.0052 (0.0040) | 0.0050 (0.0040) | | 0.0043 (0.0040) | 0.0043 (0.0039) |
| β_5 <i>Imports</i> | | 0.0063 (0.0040) | 0.0062 (0.0040) | | 0.0062 (0.0040) | 0.0057 (0.0040) |
| β_6 <i>FirmSize</i> | | 0.0037*** (0.0006) | 0.0036*** (0.0006) | | 0.0035*** (0.0006) | 0.0035*** (0.0006) |
| β_7 <i>PctForSales</i> | | -0.0177** (0.0085) | -0.0180** (0.0085) | | 0.0179 (0.0433) | 0.0224 (0.0462) |
| β_8 <i>Profit Margin</i> | | 0.1145*** (0.0081) | 0.1146*** (0.0081) | | 0.1144*** (0.0081) | 0.1137*** (0.0080) |
| β_9 <i>Consolidated</i> <i>Stat Rate</i> | | 0.0108* (0.0064) | 0.0092 (0.0064) | | 0.0129** (0.0062) | 0.0150** (0.0063) |
| β_{10} <i>Conflicted</i> <i>Sales Percent</i> | | 0.0092** (0.0030) | 0.0091*** (0.0019) | | 0.0086*** (0.0029) | 0.0091*** (0.0030) |
| β_0 <i>Intercept</i> | | -0.0303*** (0.0093) | -0.0296*** (0.0030) | | -0.0295*** (0.0092) | -0.0310*** (0.0092) |
| Year fixed effects | | Yes | Yes | | Yes | Yes |
| Industry fixed effects | | Yes | Yes | | Yes | Yes |
| R^2 | | 0.1631 | 0.1630 | | 0.1633 | 0.1620 |
| Sample N | | 15,498 | 15,498 | | 15,498 | 15,498 |
| F -test between β_1 and β_2 | | 4.18** | 1.65 | | 34.96*** | 10.20*** |

Notes: *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent two-tailed levels, respectively. We estimate consolidated-level OLS regressions and report robust standard errors, clustered by firm, in parentheses. Column (1) reports results using *One_Authority* as our measure of *Gov't-Coordination*. Column (2) reports results using *One_Audit* as our measure of *Gov't-Coordination*. Column (3) reports results using *Centralized* as our measure of *Corp-Coordination*. Column (4) reports results using *Expat* as our measure of *Corp-Coordination*. *Total Taxes Paid* is defined as income taxes plus other taxes, scaled by consolidated total assets. *Not Coordinated* (*Coordinated*) reflects the proportion of MNCs' affiliate sales that are not coordinated (coordinated) using the definition of *Gov't-Coordination* or *Corp-Coordination* specified in that column. See the Appendix for other variable definitions. Bold denotes variables of interest.

Next, we investigate whether the total tax burden of MNCs varies with the proportion of foreign affiliates that are coordinated with the U.S. parent. Here, we predict that the coefficient on *Coordinated* in columns (3) and (4) will be significantly less than the coefficient on *Not Coordinated*. We specify *Corp-Coordination* as either *Centralized* or *Expat*.³⁴ Results are consistent with this prediction. In both column (3), where *Corp-Coordination* is defined by whether the foreign affiliate uses the U.S. dollar as its functional currency, and column (4), where *Expat* is our proxy for *Corp-Coordination*, we estimate that the effect of *Coordinated* is significantly more negative than the effect of *Not Coordinated* (F -test = 37.59 and 10.50, respectively). These results suggest that U.S. MNCs can lower their total tax burden by increasing the coordination between foreign affiliates and the parent entity.

8. Conclusion

The interaction between incentives arising from customs duties and income taxes in setting transfer prices on intrafirm trade has largely been ignored in the academic literature. Using affiliate-level data collected by the BEA over the period 1982 through 2005, we demonstrate that when a single price will not jointly minimize customs duties and income taxes, firms alter the traditional income tax-motivated behavior documented in the transfer pricing literature. Our results suggest that the average foreign affiliate of a U.S. MNC in our sample with conflicting incentives appears to forgo some income tax savings in favor of duty savings.

We build on this baseline result to examine whether governmental tax enforcement coordination and/or corporate tax planning coordination affect the transfer pricing behavior of firms with conflicting incentives. We first test whether the effect of the conflict on income tax-motivated transfer pricing is stronger for firms with integrated enforcement. In practice, if firms cannot report inconsistent transfer prices on intrafirm trade for customs and income taxes, then duty minimization should become a greater consideration in transfer pricing decisions for conflict firms. Results are consistent with this expectation: firms with a significant transfer pricing conflict appear even less likely to engage in income tax-motivated transfer pricing in jurisdictions where the income tax and customs administrations are coordinated.

We also examine whether the effect of the transfer pricing conflict is stronger for firms that are more likely to coordinate their tax minimization efforts. Duty minimization should become a greater consideration in transfer pricing decisions when firms are more likely to be aware of conflicting duty payments in setting transfer prices for income tax purposes. Consistent with this expectation, we do not observe income tax-motivated transfer pricing in firms with a significant transfer pricing conflict when the U.S. operation has relatively greater information about and authority over foreign affiliates. These findings are novel because they link the organizational structure of the firm to its tax planning decisions. We also find that firms with conflicting incentives that are also private, engaged in more extensive amounts of international trade, or smaller appear to focus more (less) on income tax (duty) minimization.

Finally, we investigate whether U.S. MNCs' aggregate tax burdens are affected by the change in transfer pricing behavior we document. We find evidence that U.S. MNCs with a greater percentage of affiliates facing governmental coordination report greater tax burdens. Additionally, we find that U.S. MNCs with a higher percentage of affiliates

34. We calculate *Coordinated* and *Not Coordinated* as the percentage of foreign subsidiaries either coordinated or not coordinated under a particular measure of *Corp-Coordination*, which requires subsidiary-level variation. Thus, we are unable to use our other *Corp-Coordination* variables in this specification because they are calculated at the consolidated firm level.

coordinated with the U.S. parent report significantly lower tax burdens. Thus, the transfer pricing behavior we document at the affiliate-level appears to significantly impact the total tax burden of the firm.

Appendix

*Variable definitions**

| Variable | Definition |
|------------------------|---|
| <i>Buyer</i> | Equal to one if the foreign affiliate buys from its U.S. parent, and zero otherwise |
| <i>High-Income-Tax</i> | Equal to one if $t_f > t_{US}$, and zero otherwise, where t_f equals the ratio of foreign income tax expense to pre-tax income, and t_{US} equals the U.S. statutory rate |
| <i>Conflict</i> | Equal to one when both <i>Buyer</i> and <i>High-Income-Tax</i> are equal to one, or both <i>Buyer</i> and <i>High-Income-Tax</i> are equal to zero, and zero otherwise |
| <i>Conflict25</i> | Equal to one if <i>Conflict</i> equals one and <i>Duty</i> is greater than 25 percent of the income tax transfer pricing incentive (e.g., the absolute value of ITPI) |
| <i>Conflict50</i> | Equal to one if <i>Conflict</i> equals one and <i>Duty</i> is greater than 50 percent of the income tax transfer pricing incentive (e.g., the absolute value of ITPI) |
| <i>Conflict75</i> | Equal to one if <i>Conflict</i> equals one and <i>Duty</i> is greater than 75 percent of the income tax transfer pricing incentive (e.g., the absolute value of ITPI) |
| <i>One_Authority</i> | Measure of <i>Gov't-Coordination</i> . Equal to one if the revenue body and customs agency are formally integrated into a single governmental authority, and zero otherwise, as reported by Organization for Economic Co-operation and Development (OECD) (2006, 2009) |
| <i>One_Audit</i> | Measure of <i>Gov't-Coordination</i> . Equal to one if the revenue body conducts tax audits such that multiple types of tax liabilities are audited simultaneously, and zero otherwise, as reported by the Organization for Economic Co-operation and Development (OECD) (2006, 2009) |
| <i>Private</i> | Measure of <i>Corp-Coordination</i> . Equal to one if the firm does not have publicly traded equity, and zero otherwise |
| <i>Centralized</i> | Measure of <i>Corp-Coordination</i> . Equal to one if the functional currency of the foreign affiliate is the U.S. dollar, and zero otherwise |
| <i>Expat</i> | Measure of <i>Corp-Coordination</i> . Equal to one if the foreign affiliate employs at least one U.S. expatriate, and zero otherwise |
| <i>TradeDum</i> | Measure of <i>Corp-Coordination</i> . Equal to one if <i>Pct_Export</i> or <i>Pct_Import</i> are above the median of the sample distribution, and zero otherwise |
| <i>SizeDum</i> | Measure of <i>Corp-Coordination</i> . Equal to one if <i>logFirmAssets</i> is below the median of the sample distribution, and zero otherwise |

(The Appendix is continued on the next page.)

Appendix (continued)

| Variable | Definition |
|--|--|
| <i>Duty</i> | Average country-year import duty rate, as reported by the World Bank, net of the income tax rate in the country of the buyer: t_f or t_{US} |
| <i>ITPI</i> | Measures the income tax transfer pricing incentive and is equal to $(t_f - t_{US})$ |
| <i>PTI</i> and <i>logPTI</i> | <i>PTI</i> (<i>logPTI</i>) equals (the natural log of) foreign affiliate pre-tax income |
| <i>Assets</i> and <i>logAssets</i> | <i>Assets</i> (<i>logAssets</i>) equals (the natural log of) foreign affiliate total assets |
| <i>Compensation</i> and <i>logComp</i> | <i>Compensation</i> (<i>logComp</i>) equals (the natural log of) foreign affiliate total employee compensation |
| <i>GDP</i> and <i>logGDP</i> | <i>GDP</i> (<i>logGDP</i>) equals (the natural log of) gross domestic product in the foreign affiliate's country, as reported by the Economist Intelligence Unit |
| <i>logFirmAssets</i> | Natural log of firm total assets |
| <i>Pct_Export</i> | Measures the significance of intrafirm trade for the firm as the ratio of total U.S. exports to total U.S. sales |
| <i>Pct_Import</i> | Measures the significance of intrafirm trade for the firm as the ratio of total U.S. imports to total U.S. sales |
| <i>Inventory</i> | Consolidated inventory, scaled by consolidated total assets |
| <i>PPE</i> | Consolidated net PPE, scaled by consolidated total assets |
| <i>Imports</i> | Consolidated imports, scaled by consolidated total assets |
| <i>FirmSize</i> | Natural log of worldwide sales |
| <i>PctForSales</i> | Total foreign sales as a percentage of worldwide sales |
| <i>Profit Margin</i> | Consolidated income before income and other taxes, scaled by lagged consolidated total assets |
| <i>Consolidated Stat Rate</i> | Statutory income tax rate of each affiliate, weighted by pre-tax income |
| <i>Conflicted Sales Percent</i> | Percent of worldwide sales generated by conflicted affiliates |

Notes: *All variables computed using BEA data unless otherwise noted.

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