

The Effective Income Tax Experience of Decentered Multinationals
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Abstract

In this paper, we examine how the choice to incorporate a parent corporation outside of the United States affects the effective income tax rates of global firms. We are interested in “decentered” firms (Desai (2009)), by which we mean firms that have material business in the U.S. and a parent firm incorporated outside the U.S. Some of these firms are inversion firms, but inversion transactions are not our focus.

We find that for profit firm years, decentered firms have lower effective tax rates compared to multinationals with U.S. parent corporations, including book effective tax rates lower by 5 percentage points. However, decentered firms record smaller tax benefits in loss firm years, which can be translated to a book effective tax rate that is greater by 2 percentage points. Firms with a tax haven parent show the strongest results, while firms with a Canadian parent show the weakest results.

Additional testing suggests that the better performance of decentered firms in profit firm years is due to earnings stripping. For loss firm years, we find some evidence that firms with U.S. parent corporations can record greater negative tax expense due to the worldwide U.S. tax law system. We also find suggestive evidence that valuation allowance practice contributes to the recording of larger negative tax expense by firms with U.S. parent corporations in loss firm years.

There is no statistically significant difference for decentered firms that have experienced an inversion transaction. This suggests that tax policies should address the challenge of decentered firms broadly, rather than narrowly targeting inverted firms.

1. Introduction

This paper considers how the choice to separate incorporation location of the parent corporation in a firm from the place of business operations impacts the effective tax rate of a multinational company (“MNC”). We investigate whether “decentered” (Desai (2009)) global firms with material U.S. operations and non-U.S. parent corporations experience better income tax results. We are interested in whether such non-U.S. firms show lower positive tax expense or larger negative tax expense, as compared to MNCs with parents incorporated in the U.S. We also

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consider whether the income tax results are even better for a firm that has decentered through an inversion transaction and whether they differ based on the jurisdiction of incorporation. Finally, we report additional testing that seeks to identify the mechanism for the results we observe.

Some work on decentered firms with material U.S. operations and a non-U.S. parent corporation has focused on firms that originally had a U.S. parent, but then changed their structure to a non-U.S. parent structure in a so-called inversion transaction. This focus on inversion firms is not our approach. The tax experience of decentered firms in general is broadly interesting as a policy matter. The non-U.S. parented MNCs subject to U.S. tax policy include any firm with a U.S. business presence, despite the interest in regulating inversions through specialized legislation and regulation.

We use an innovative approach to build our sample of decentered firms with material U.S. operations and a non-U.S. parent. We do not assume that a firm is centered at its incorporation location. Instead, we analyze firms' publicly available financial statements to determine whether a non-U.S.-incorporated firm either (1) reports a U.S. headquarters location or (2) has a material presence in the United States. We define material presence as more than 25% of at least one of total sales, payroll or property located in the United States (or, if available data requires this assumption, in North America or in the Americas), in more than 25% of firm years. Our sample includes 4,884 unique multinational firms with material U.S. presence. Of these 4,884 firms, 683 are decentered under our definition. Of the 683 decentered firms, 50 are inversion firms identified in public lists as having undergone an inversion transaction.

We consider both the profit and the loss experience of these decentered firms, as compared to the experience of multinational firms with a U.S. parent. Examining both profit and loss experience is important to understanding effective tax rates results in our data set because a sizable percentage of the firm years that we observe are loss years. For firms with a U.S. parent, about 32% of the firm years are loss years, and for all firms with a non-U.S. parent, about 28% of the firm years are loss years. For inversion firms, about 20% of the inversion firm years that we observe are loss years.

Our key findings are as follows. First, multinational firms with parents incorporated in non-U.S. jurisdictions have better tax results in profitable years. For example, compared to U.S. incorporated firms, the book effective tax rate in profit firm years is lower by 5 percentage points, and each of the cash effective tax rate and the three-year long-run cash effective tax rate is lower by 3 percentage points. Second, multinational firms with non-U.S. parents overall have worse tax results in loss years, by an amount that translates to 2 percentage points' difference in a book effective tax rate measure.

We find that our results hold for non-U.S.-parented firms that have undergone an inversion transaction. There is no statistically significant difference between the results we observe for non-U.S.-parented firms generally and the results we observe for inversion firms. This result supports the view that the challenge presented to the U.S. income tax system by decentered firms is general, not specific to inverted firms.

We also find that of three geographic non-U.S. incorporation subgroups, the smallest and weakest differences we observe are for non-U.S. firms incorporated in Canada. We observe the strongest results for non-U.S. firms incorporated in a tax haven. Non-U.S. firms incorporated other than in Canada or a tax haven also show statistically significant differences for book effective tax rate results for both profit and loss firms.

We use several additional tests to investigate the mechanism for the main results we observe. We find that for profit firm years, lower current tax expense, in addition to lower deferred tax expense, drives lower ETRs for firms with a non-U.S. parent. We interpret this result to suggest that a non-U.S.-parented firm has more opportunity to earnings strip and erode its U.S. tax base with intercompany deductions.

For loss firm years, our sample includes approximately equal numbers of firms that show negative total tax expense and positive total tax expense, as well a material number that show zero tax expense. The two-fifths of the loss years that show negative total tax expense drive our main result that loss firms with non-U.S. parents have worse tax results. This presents a puzzle, since better earnings stripping opportunities might cause firms with non-U.S. parents to show more negative tax expense in loss years as well as causing such firms to show less positive tax expense in profit years. In additional testing, we find suggestive evidence that the better tax results (i.e., greater negative tax expense) for U.S.-parented firms in loss years is due to worldwide U.S. tax rules, which may allow U.S.-parented firms to record larger negative tax expense with respect to non-U.S. losses. We also find suggestive evidence that valuation allowance practice supports the result that U.S.-parented firms have better results in loss firm years.

This paper proceeds as follows. Section 2 presents related research. Section 3 outlines the problem of multinational firm location and tax planning and develops our main hypotheses. Section 4 presents our study design. Section 5 discusses our main tax rate results for profit and loss firm years. Section 6 provides the results of additional testing related to inversion firms, geographic subgroups, and mechanisms for results for profit and loss firm years. Section 7 concludes.

2. Related research

A substantial body of research examines the tax planning of multinational corporations. For instance, Clausing (2009), DeSimone et al. (2015) and Dowd et al. (2015) document income shifting among MNC affiliates. Hanlon and Heitzman (2012) report substantial work on transfer pricing. DeSimone (2016) demonstrates that adoption of a common accounting standard by MNC affiliates correlates with increased income shifting.

Other work considers MNCs subject to territorial and worldwide tax laws. Under a territorial regime, the tax jurisdiction of the parent corporation only taxes income attributed to that jurisdiction. This contrasts with worldwide regimes, most prominently the United States. If a parent is incorporated in the U.S., the U.S. worldwide tax law taxes the parent on all of its worldwide income, not only the income attributed to the United States. The U.S. law allows a

U.S. parent to defer paying tax on income earned by non-U.S. subsidiaries. It taxes the U.S. parent upon the repatriation of such non-U.S. profit, subject to reduction for foreign tax credits. Markle (2016) shows that MNCs subject to territorial tax regimes engage in more income shifting involving the parent corporation compared to MNCs subject to worldwide tax regimes. Kohlase and Pierk (2016) similarly provide evidence that foreign subsidiaries of U.S. parents engage in less tax avoidance than the foreign subsidiaries of non-U.S. parents, perhaps because of the reduced benefit from tax planning imposed by a worldwide taxation system.

Within the literature on MNC tax planning there is work that examines the effective tax rates of multinational corporations. This literature shows that multinationals with U.S. parents are among the highest taxed, second only to MNCs with Japanese parents (Markle and Shackelford (2012), Markle and Shackelford (2014)). Also, U.S. corporations with multinational operations have lower book effective tax rates compared to corporations that only have domestic U.S. operations (Rego (2003)). However, the cash effective tax rate faced by both multinational and domestic U.S. corporations has declined at a similar rate over time (Dyreng et al. (2014)).

Other studies have examined factors related to differences in MNC effective tax rates. For instance, Dyreng & Lindsey (2009) show that a multinational with a U.S. parent and at least one tax haven incorporated subsidiary faces a lower worldwide tax burden than a similar firm without a tax haven incorporated subsidiary, by about 1.5 percentage points. Armstrong et al. (2012) find that a higher proportion of foreign assets correlates with higher GAAP effective tax rates. Dharmapala and Riedel (2012) show that firms shift income to lower tax affiliates after an increase to the parent company's tax rate. Hope et al. (2013) show that the decision to discontinue geographic earnings disclosure correlates with lower worldwide effective tax rates. De Simone, Klassen and Seidman (2015) demonstrate that multinational firms with loss affiliates seek to adjust transfer pricing to minimize their taxes.

In comparison to the attention paid to different cross sections and time trends in the income tax experience of MNCs with U.S. parents, less empirical attention has been paid to the impact on effective tax rates if a multinational separates its operations from its place of incorporation. This is the subject that this paper seeks to address. It builds on work reporting that foreign-controlled domestic corporations have low taxable income relative to assets compared to other U.S. corporations (Grubert, Goodspeed & Swenson (1993)) and on work reporting that foreign-controlled domestic corporations' taxable income varies depending on a firm's worldwide tax position (Mills & Newberry (2004)).

Tax reduction strategies form a subset of the “decentering” (Desai (2009)) arbitrage techniques available when a corporation separates the location of its management, operations, and governing law (Talley (2015); Kane & Rock (2008)). But in general, studies do not segregate their samples of multinationals based on whether MNCs are decentered. One reason for this is the difficulty of identifying a sufficient sample of decentered companies. For example, it has been shown that MNCs with non-U.S. parents and predominant U.S. business operations appear rarely in IPO data (Allen & Morse (2013)).

Nevertheless, the “decentering” phenomenon has received public media attention, particularly as applied to firms that become decentered because of intentional tax planning, for example through

a so-called “inversion” or “redomiciliation” transaction (Kleinbard (2014), Shay (2014)). Consistent with this media focus, some of the research done on decentered firms relates to inverted firms. The literature includes a number of small-N studies of inverted corporations. Some of these relate to causes and effects of inversions. Others consider effective tax rates.

Some studies consider possible causes of inversion. Voget and Huizinga show that multinational is more likely to relocate its headquarters if its home country imposes a tax currently on some income of foreign subsidiaries or imposes a tax upon repatriation of profits from foreign subsidiaries (Voget (2011), Huizinga & Voget (2009)). Bird, Edwards and Shevlin report that the presence of “locked-out earnings” that would be taxable on repatriation to a domestic parent increases the likelihood that an acquirer will be foreign (Bird, Edwards & Shevlin (2014)). Other studies consider results after an inversion transaction. Rao observes greater concentration of payroll and capital investment outside the United States following inversion (Rao (2015)). Cloyd, Mills and Weaver find no evidence of improved stock market performance following inversion transactions (Cloyd, Mills & Weaver (2003)).

Of the studies that consider the tax aspects of inversion transaction, one finds evidence of positive stock price reactions upon inversion and attributes it to tax savings stemming from earnings-stripping interest deductions that erode the U.S. tax base (Desai & Hines (2002)). Seida and Wempe also report results consistent with an inversion transaction providing tax benefits. This study used a matched sample strategy and found that inverted firms experienced a reduction in ETR that was about four percentage points greater than the ETR reduction for the control sample (Seida & Wempe (2004)). Finally, other research has briefly noted the remarkable tax efficiency of several decentered examples such as Tyco and Carnival (Dyreng, Hanlon & Maydew (2008) at 76).

Decentered firms with a non-U.S. parent, including but not limited to inversion firms, have a tax planning toolbox that differs from that of U.S. firms. If there is a non-U.S. parent at the top of the structure, then the MNC does not face U.S. tax rules that apply to U.S.-parented firms, including the so-called subpart F rules. Also, a MNC with a non-U.S. parent and with U.S. operations located in a subsidiary can expand its earnings-stripping planning to erode its U.S. income tax base. (Wells (2010)) Finally, such a decentered MNC can repatriate non-U.S. earnings without paying U.S. corporate income tax. (Desai & Dharmapala (2010), Shaviro (2011), (U.S. Department of Treasury (2007)).

If there is a U.S. parent at the top of the structure, then the MNC must plan around U.S. tax rules such as the anti-deferral subpart F regime. Such tax planning strategies are well established, and income shifting to low-tax jurisdictions can enable extremely low rates of tax. Fleming, Peroni & Shay (2009), Kleinbard (2011), But earnings stripping opportunities are limited. (Fleming, Peroni & Shay (2015), Wells (2010). Another drawback of such a structure is that U.S. income tax may be imposed on the repatriation of non-U.S. earnings to the U.S. parent (Morse (2013a), OECD (2013)).

The tax strategies available to MNCs with a non-U.S. parent and material U.S. operations are available whether the “decentered” structure arises from an inversion transaction or as a result of natural business growth. But much available empirical work is limited to studies of small

samples of inverted corporations. The literature contains no general consideration of the tax experience of decentered multinationals incorporated outside the United States and with a material U.S. business presence. Further, there has been no effort to compare the effective tax rate experience of such decentered multinationals in general to the experience of the subset of decentered multinationals that are inverted corporations.

In addition, existing theoretical and empirical treatments of the effective tax rates of MNCs generally focus on the experience of profitable firms, despite the significant proportion of MNC years in which MNCs recognize losses. The literature contains limited treatment of loss firms (De Simone, Klassen & Seidman (2015), Thomas & Zhang (2014), Dhaliwal et. al (2013)). This is in part because the effective tax rate results for loss firm years are more difficult to work with. For instance, although one would expect the recognition of negative tax expense in loss firm years, in fact zero or positive tax expense is recognized in a large percentage of loss firm years. But loss firm years make up a material proportion of all MNC tax years and form an important part of these firms' overall effective tax rate experience. A second goal we have in this paper is to investigate MNC tax experience in loss firm years, and in particular the difference between loss firm experience depending on whether a MNC has a U.S. or a non-U.S. parent.

3. Multinational Firm Location and Effective Tax Rate Experience

In this paper, we compare the effective tax rate experience of two kinds of publicly traded multinational corporations with material U.S. operations: Non-U.S. Firms and U.S. Firms. The distinguishing feature of these firms is the incorporation location of the parent firm. The interaction between financial accounting rules and different tax laws in different countries means that a multinational firm may record different rates of tax depending on where its parent is located (Markle and Shackelford (2014)). The earnings stripping opportunities available to Non-U.S. Firms, the worldwide taxation rules applicable to U.S. Firms, and valuation allowance practice are three factors that might cause a difference in the effective tax rate experience of Non-U.S. Firms as compared to U.S. Firms.

3.1. Non-U.S. Firms and Earnings Stripping

In a Non-U.S. Firm, the publicly traded firm that serves as the parent of the firm is a non-U.S. corporation. The non-U.S. parent owns operating companies, both non-U.S. and U.S. (Wells (2010), Treasury (2002)) Appendix 1 provides schematic diagrams of a Non-U.S. Firm structure and a U.S. Firm structure.

In the Non-U.S. Firm structure, U.S. operations are typically housed in a corporate subsidiary. U.S. income tax applies to the taxable income earned by the U.S. subsidiary, but not to income earned by other affiliates that are not engaged in U.S. business. Often the U.S. subsidiary faces a higher tax rate than the non-U.S. parent. As a result, the Non-U.S. Firm has an incentive to minimize the taxable income assigned to the U.S. subsidiary.

For accounting purposes, a Non-U.S. Firm typically reports income tax expense based on the income that is allocated to each jurisdiction for tax purposes. For the U.S. subsidiary, it reports

tax expense based on the U.S. taxable income multiplied by the U.S. rate. For all other subsidiaries it calculates tax expense based on the taxable income of each subsidiary. The total amount incurred across all jurisdictions is then reported as tax expense on the consolidated income statement.

The income allocated to each jurisdiction in an MNC structure for tax purposes is affected by tax planning such as transfer pricing (Klassen, Lisowsky & Mescall (2016)) and earnings stripping. We focus on earnings stripping here because a Non-U.S. Firm has special access to this strategy. Earnings stripping means that a U.S. subsidiary makes deductible payments, such as interest, to its non-U.S. parent. U.S. rules historically have not materially constrained earnings stripping by Non-U.S. Firms (White House and Treasury (2012), Internal Revenue Code 163(j)) although recently promulgated regulations seek to limit the deductibility of intercompany interest expense (Treas. Regs. 1.385-1 – 1.385-4). A U.S. Firm cannot earnings strip in the same fashion as a Non-U.S. Firm. This is because intercompany payments such as interest made by a U.S. parent to a low-tax non-U.S. holding company subsidiary are generally treated as currently taxable subpart F income (Wells (2010)).

Earnings stripping causes a permanent difference in the taxable income of the U.S. subsidiary. That is, if earnings stripping is successful, high U.S. income tax rates will apply to lower net income allocated to U.S. affiliates within a Non-U.S. Firm. The taxable income of the non-U.S. parent correspondingly increases, but total book tax expense still decreases, because the non-U.S. parent typically pays tax at a lower rate than the U.S. subsidiary.¹ Earnings stripping should cause Non-U.S. Firms to recognize smaller current tax expense compared to U.S. Firms. The smaller current tax expense will not be offset by a larger deferred tax expense for Non-U.S. Firms, because earnings stripping produces a permanent difference (Seida & Wempe (2004) n.6).

3.2. U.S. Firms and Worldwide Taxation

In a U.S. Firm, a U.S. corporation serves as the publicly traded parent corporation, and foreign operations are often held in some variation of a three-box structure. In this structure, the U.S. parent owns a non-U.S. holding company; and the non-U.S. holding company owns a non-U.S. operating company. (Kleinbard (2011), Shay (2004)) Appendix 1 provides schematic diagrams of a Non-U.S. Firm structure and a U.S. Firm structure.

In the U.S. Firm structure, the affiliate with the lowest income tax rate is typically the non-U.S. holding company. A U.S. Firm faces an incentive to allocate income to the low-tax non-U.S. holding company and deductions to other, higher-tax affiliates. Strategies include transfer pricing, intercompany financing, and hybrid entities and instruments (Altshuler and Grubert (2002), Fleming, Peroni and Shay (2009), Kleinbard (2011), OECD (2013)). Empirical research shows that the effect of these strategies is to move taxable income to the low-tax non-U.S. affiliates and thus reduce tax liability (Clausing (2009), Klassen and LaPlante (2012)), at least to some extent (Dharmapala (2014)).

¹ The result of a permanent difference as a result of earnings stripping holds whether a Non-U.S. Firm reports based on IFRS or GAAP standards. [See [http://www.iasplus.com/en-us/standards/ifrs-usgaap/income-taxes.](http://www.iasplus.com/en-us/standards/ifrs-usgaap/income-taxes)] Only 35 of the Non-U.S. Firms in our sample code their accounting standard as IFRS according to Compustat records.

For accounting purposes, the recording of tax expense for U.S. Firm can be divided into two parts. First, the U.S. Firm typically reports income tax expense for accounting purposes based on the income that is allocated to each jurisdiction for tax purposes. This is the same as the approach taken for Non-U.S. Firms. For the non-U.S. affiliates of the U.S. Firm, tax expense is recorded based on the income allocated to each jurisdiction multiplied by the non-U.S. rate. For the U.S. parent, tax expense is likewise initially calculated based on the taxable income allocated to the U.S. parent, multiplied by the U.S. rate.

For U.S. Firms, accounting for income tax expense also involves a second part. This is because of the worldwide system of U.S. income taxation. That is, the U.S. system extends its tax jurisdiction beyond the income allocated to the U.S., and also reaches the income earned by the non-U.S. subsidiaries of the U.S. Firm. So-called subpart F income, which includes certain passive or mobile income earned by non-U.S. subsidiaries of a U.S. firm, is taxed when earned. Other non-U.S. income is taxed when it is repatriated to the U.S. parent, (Graham, Hanlon and Shevlin (2010)), subject to reduction for foreign tax credits attributable to any tax paid by at the non-U.S. affiliate level (Gravelle (2012)).

Many U.S. Firms use sophisticated tax planning strategies to minimize subpart F income. (Fleming, Peroni and Shay (2009); Kleinbard (2011), Lokken (2005)). When subpart F income is minimized, the profit earned by non-U.S. subsidiaries is not taxed immediately. Instead, the tax on most non-U.S. profit earned by U.S. Firms is deferred until it is repatriated (Graham, Hanlon & Shevlin (2010a)).

The default assumption for financial accounting purposes is that the non-U.S. profit earned by the non-U.S. subsidiaries of U.S. firms will eventually be repatriated. As a result the default rule is that deferred tax expense is recorded for financial accounting purposes when the related non-U.S. profit is earned (PWC (2012)). This default rule does not apply to the extent the non-U.S. profit is designated “permanently reinvested earnings,” or PRE. No tax expense is required to be recorded for non-U.S. profit designated PRE. Instead, if non-U.S. profit is designated PRE, the tax rate advantage provided by the allocation of taxable income to a low-tax non-U.S. holding company (or other non-U.S. subsidiary) is recorded as a permanent difference. (NTDASC 740). Empirical evidence shows that many U.S. Firms designate PRE, although typically not for all of their non-U.S. profit (Blouin, Krull and Robinson (2014); Graham, Hanlon & Shevlin (2010b); Krull (2004)).

3.3. Non-U.S. Firm versus U.S. Firm: Profit Firm Year Example

Below is an example that illustrates the impact of earnings stripping opportunities for Non-U.S. Firms and worldwide taxation for U.S. Firms on the tax expense recorded for financial accounting purposes in Profit Firm Years.

Consider a firm that has two corporate affiliates. One is non-U.S. and one is U.S. The firm is organized either as a Non-U.S. Firm, meaning that the non-U.S. affiliate is the parent and the U.S. affiliate is the subsidiary; or as a U.S. Firm, meaning that the U.S. affiliate is the parent and

the non-U.S. affiliate is the subsidiary. The tax rate applicable to non-U.S. income is 10%, and the tax rate applicable to U.S. income is 35%.

The firm as a whole earns 150 in profit whether it is organized as a Non-U.S. Firm or as a U.S. Firm. The non-U.S. business of the firm is about half the size of the U.S. business of the firm (after taking common tax planning strategies such as transfer pricing into account). Without earnings stripping, the firm it would allocate 100 to the U.S. affiliate and 50 to the non-U.S. affiliate. Before taking worldwide taxation (if applicable) into account, this income split supports the recording of U.S. tax expense of 35 (i.e., $100 * 35\%$) and non-U.S. tax expense of 5 ($5 * 10\%$). The tax expense would total 40 and the effective tax rate would be about 26.7%.

If the firm is a Non-U.S. Firm, it may take advantage of earnings stripping opportunities. For instance, it might use intercompany debt to shift 20 of income to the non-U.S. affiliate. This would cause 80 to be allocated to the U.S. affiliate and 70 to be allocated to the non-U.S. affiliate. Such a Non-U.S. Firm would record U.S. tax expense of 28 ($80 * 35\%$) and non-U.S. tax expense of 7 ($70 * 10\%$). The tax expense would total 35 and the effective tax rate would be 23.3%. In this example, earnings stripping would cause a tax savings of 5 for the Non-U.S. Firm, and a difference in the effective tax rate of about 3.3%. The tax savings due to earnings stripping would be reflected as lower current tax expense for the Non-U.S. Firm as compared to the U.S. Firm.

If the firm is a U.S. Firm, it cannot take advantage of the same earnings stripping opportunities. In addition, the U.S. Firm must account for worldwide taxation. This means that it must record U.S. tax expense for the profit allocated to its non-U.S. subsidiary, unless that profit is designated as PRE. In this example, we assume that half of the non-U.S. profit is designated PRE. Because the U.S. Firm does not have access to the same earnings stripping opportunities as the Non-U.S. Firm, the Non-U.S. income would be 50 (rather than 70). The default rule requiring the recording of deferred tax expense for financial accounting purposes will apply for the other half of the non-U.S. profit. Tax expense will be recorded for half of the non-U.S. income of 50, or for non-U.S. income equal to 25.

Recording additional tax expense in the U.S. Firm due to worldwide taxation must also take account of the foreign tax credit. The foreign tax credit, roughly speaking, reduces the U.S. tax due on repatriation by the tax already paid on the repatriated profit to other jurisdictions. In our example, because of the foreign tax credit, the U.S. rate applicable to the non-U.S. profit not designated PRE in the U.S. Firm structure equals the U.S. rate of 35% minus the non-U.S. rate of 10%. This difference is 25%.

In this example, the amount of non-U.S. income not designated PRE is 25 (i.e., half of 50), and tax expense would be recorded with respect to that non-U.S. income at a rate of 25%. Thus, an additional tax expense of 6.25 would be recorded at the U.S. Firm. After considering worldwide taxation, the tax expense of the U.S. firm is more than the 40 initially calculated above. It is 46.25, and the effective tax rate is not 26.7% but rather is 30.8%. In this example, the effect of worldwide taxation is to produce an additional difference in the effective tax rate of about 4.2%. The difference due to worldwide taxation would be reflected as higher deferred tax expense for the U.S. Firm compared to the Non-U.S. Firm.

3.4. Loss Firms: Earnings Stripping, Worldwide Taxation and Valuation Allowances

In this study, we consider the effective tax rate experience of loss firm years, as well as profit firm years. The tax law and financial accounting treatment for loss firm years raises issues not present for profit firm years. These issues have not been fully explored in previous literature. Many studies of the effective tax rate experience of international firms omit loss firms from data samples. [NTD: add cites]

Comparing the effective tax experience of U.S. Firms and Non-U.S. Firms among the loss firms in our sample presents both of the issues considered above for profit firms, namely earnings stripping and worldwide taxation. In addition, loss firms present the question of valuation allowance practice.

A firm in a loss year may report negative income tax expense for accounting purposes based on the loss that is allocated to each jurisdiction for tax purposes. A negative tax expense indicates that the book loss will support lower income tax payments, or a tax refund, in the current or future years, for instance because of carry back or carry forward rules.

For both Non-U.S. Firms and U.S. Firms in loss years, a part of the financial accounting for negative income tax expense is the same. In each case, the firm may report negative tax expense for accounting purposes based on the loss that is allocated to each jurisdiction for tax purposes. Non-U.S. affiliates will record negative tax expense based on loss allocated to Non-U.S. jurisdictions, multiplied by the Non-U.S. rate. U.S. affiliates will record negative tax expense based on the income allocated to the U.S., multiplied by the U.S. rate.² The total amount incurred across all jurisdictions is then reported as negative tax expense on the consolidated income statement.

The magnitude of a negative tax expense is related to the statutory income tax rate of the jurisdiction where the losses are recorded. For instance, if the losses are recorded in the U.S., the recorded negative tax expense will be greater than if the losses are recorded in the Cayman Islands, because the U.S. has a statutory income tax rate of 35% and the Cayman Islands has a statutory income tax rate of 0%. The current or deferred status of a negative tax expense depends on how the loss will be used. For instance, if the negative expense is the result of a current tax refund (for example, as a result of a carry back rule) it will produce a negative current tax expense. If it must await future profits before it can be used (for example, under a carry forward rule), the firm will accrue a negative deferred tax expense.

The opportunity presented to Non-U.S. Firms to earnings strip affects the reporting of negative income tax expense in loss years,. Since earnings stripping allows Non-U.S. Firms to allocate more deductions to their U.S. affiliates, it might be expected that in loss years, the U.S. losses of Non-U.S. Firms are larger than they would be if the firm had a U.S. Firm structure. We would

² Some subsidiaries or jurisdictions could have profit and cause the reporting of a positive tax expense, even if the firm overall is in a loss position.

expect earnings stripping to cause Non-U.S. Firms to have a larger negative tax expense – and, thus, better tax results – than U.S. Firms in loss years as well as in profit years.

The impact of worldwide taxation affects U.S. Firms as compared to Non-U.S. Firms in loss years as well as in profit years. In profit years, U.S. Firms should record larger positive tax expense compared to Non-U.S. Firms because of worldwide taxation. In contrast, in loss years, U.S. Firms should record larger negative tax expense compared to Non-U.S. Firms because of worldwide taxation. When U.S. Firms realize non-U.S. losses in their non-U.S. subsidiaries, these losses can reduce the U.S. tax that will eventually be due on the repatriation of non-U.S. profit. For instance, the losses can reduce the earnings and profits of a non-U.S. subsidiary, out of which the subsidiary might in the future pay taxable dividends to the U.S. parent of the U.S. Firm. Thus, non-U.S. losses can produce negative tax expense recorded at the U.S. rate. However, this result should apply only to the extent that the firm does not designate non-U.S. profit and loss as PRE.

In other words, earnings stripping and worldwide taxation provide offsetting effects for the effective tax rate experience of Non-U.S. Firms compared to U.S. Firms. Earnings stripping should tend to increase the negative tax expense of Non-U.S. Firms. Worldwide taxation should tend to increase the negative tax expense of U.S. Firms.

A third factor is valuation allowance practice. Valuation allowances constrain firms' ability to record negative tax expense when firms recognize losses. They apply when a firm seeks to record a negative deferred tax expense based on the theory that the loss will be used to reduce income in the future. Before recognizing such an expense, the firm must make an evaluation as to the likelihood that it will generate sufficient future taxable income to recognize the potential benefit. If the firm determines it is "more likely than not" that it will not be able to recognize the entire benefit, based on the weight of available evidence, it must record a valuation allowance. A valuation allowance reduces negative deferred tax expense to the amount that it assumes will actually be realized (ASC 740). In some cases this will result in a "full" valuation allowance completely offsetting the entire negative deferred tax expense. One commonly used rule of thumb is that if a firm has accumulated net losses for three consecutive years, it may not assume that additional losses will reduce tax in future profit years and therefore it must record a valuation allowance. (KPMG 2012).

Is there reason to think that there will be a systematic difference in valuation allowance practice for Non-U.S. Firms as opposed to U.S. Firms? One idea is that Non-U.S. Firms' earnings stripping opportunities, which result in the allocation of more deductions to U.S. affiliates, make it more likely that the U.S. affiliates of Non-U.S. Firms will show losses. If these affiliates show losses over several accounting periods, then it is more likely that they will be required to record a valuation allowance. If establishing valuation allowances for non-U.S. affiliates is more prevalent among Non-U.S. Firms, then the valuation allowance may reverse the effect of the earnings stripping opportunity available to Non-U.S. Firms. In other words, the earnings stripping available to Non-U.S. Firms can allow them to allocate additional deductions to U.S. affiliates, but if those U.S. affiliates show too much loss, then the Non-U.S. Firm may be required to establish a valuation allowance which will prevent the firm from recording negative

tax expense with respect to the additional earnings stripping deductions as well as, perhaps, with respect to the losses allocated to a U.S. affiliate without regard to earnings stripping

3.5. Loss Firms: Non-U.S. Firm versus U.S. Firm: Numerical Example

Below is an example that illustrates the impact of earnings stripping opportunities for Non-U.S. Firms, worldwide taxation for U.S. Firms, and valuation allowance practice on the tax expense recorded for financial accounting purposes in loss years.

Consider a firm that has two corporate affiliates. One is non-U.S. and one is U.S. The firm is organized either as a Non-U.S. Firm, meaning that the non-U.S. affiliate is the parent and the U.S. affiliate is the subsidiary; or as a U.S. Firm, meaning that the U.S. affiliate is the parent and the non-U.S. affiliate is the subsidiary. The tax rate applicable to non-U.S. income is 10%, and the tax rate applicable to U.S. income is 35%.

The firm as a whole shows 150 in loss whether it is organized as a Non-U.S. Firm or as a U.S. Firm. The non-U.S. business of the firm is about half the size of the U.S. business of the firm (after taking common tax planning strategies such as transfer pricing into account). Without earnings stripping, the firm would allocate 100 of loss to the U.S. affiliate and 50 of loss to the non-U.S. affiliate. In a base case scenario, before taking worldwide taxation (if applicable) into account, this income split supports the recording U.S. negative tax expense of 35 (i.e., $100 * 35\%$) and negative non-U.S. tax expense of 5 ($5 * 10\%$). The negative tax expense would total 40 and the effective tax rate would be about -26.7%.

If the firm is a Non-U.S. Firm, it may take advantage of earnings stripping opportunities. For instance, it might use intercompany debt to shift 20 of interest deductions to the U.S. affiliate. This would cause 120 of loss to be allocated to the U.S. affiliate and 30 of loss to be allocated to the non-U.S. affiliate. Such a Non-U.S. Firm would record negative U.S. tax expense of 42 ($120 * 35\%$) and negative non-U.S. tax expense of 3 ($30 * 10\%$). The tax expense would total negative 45, which suggests that earnings stripping allowed the Non-U.S. Firm to claim an extra 5 of negative tax expense.

If the firm is a U.S. Firm, it cannot take advantage of the same earnings stripping opportunities. However, the U.S. Firm might record additional negative tax expense because of the worldwide taxation rules. These rules may allow the U.S. Firm to record negative U.S. tax expense for the loss allocated to its non-U.S. subsidiary, assuming that the U.S. Firm has some non-U.S. profit and loss that is not designated PRE. In this example, we assume that half of the non-U.S. loss can be treated as offsetting profit not designated PRE. Because the U.S. Firm does not have access to the same earnings stripping opportunities as the Non-U.S. Firm, the Non-U.S. income would be 50 (rather than 30) from the U.S. firm. The default rule requiring the recording of deferred tax expense for financial accounting purposes will apply for one half of the non-U.S. loss. Tax expense will be recorded for half of the non-U.S. loss of 50, or for non-U.S. income equal to 25, in this example at a tax rate of 25% (to take account of the foreign tax credit, as described above). The worldwide tax system would allow the U.S. Firm to claim an extra 6.25

of negative tax expense, for a total of 46.25. This contrasts with the base case, where 40 of negative tax expense was recorded.

The earnings stripping and worldwide taxation effects offset each other in the loss firm case. The earnings stripping effect supports larger negative tax expense at a Non-U.S. Firm while the worldwide taxation effect supports larger negative tax expense at a U.S. Firm.

Valuation allowance practice is also a consideration. To illustrate, consider the Non-U.S. Firm in this example. Perhaps its allocation of extra deductions to its U.S. affiliate (as a result of earnings stripping) makes it more likely that the U.S. affiliate will show a loss for several accounting periods in a row. This in turn would make it more likely that the Non-U.S. Firm would be required to record a valuation allowance, which would prevent the Non-U.S. Firm from recording all or a portion of its negative tax expense. If, for instance, the Non-U.S. Firm is required to record a valuation allowance for one-fifth of its U.S. losses, then the negative tax expense related to one-fifth of the 120 of losses allocated to its U.S. affiliate would not be allowed to be recorded. In this example, the Non-U.S. Firm would not be allowed to recording negative U.S. tax expense with respect to 24 of its 120 of U.S. loss. Instead, it would record negative U.S. tax expense of about 34 (i.e., $96 * 35\%$) and negative non-U.S. tax expense of 3 ($30 * 10\%$). The negative tax expense for such a Non-U.S. Firm would total about 37, meaning that the Non-U.S. Firm would be disallowed from claiming 3 of the negative tax expense recorded relative to the base case, where 40 of negative tax expense was recorded.

3.6. Main Hypotheses

We identify several reasons why a profitable U.S. Firm will likely have a higher effective tax rate than a Non-U.S. Firm. The two most important reasons are that a U.S. Firm has less opportunity to earnings strip and that so long as a U.S. Firm designates less than all of its non-U.S. profit as PRE, worldwide taxation rules will require the U.S. Firm to record positive tax expense with respect to at least some non-U.S. profit. These reasons support our first hypothesis:

H1: For profit firm years, Non-U.S. Firms have less positive tax expense (that is, better tax results) compared to U.S. Firms.

In the case of loss firms, earnings stripping opportunities suggest that Non-U.S. Firms will record more negative tax expense than U.S. Firms. But worldwide taxation suggests that U.S. Firms will record more negative tax expense than Non-U.S. Firms. The possibility that valuation allowances will be more prevalent at Non-U.S. Firms also suggests that U.S. Firms will record more negative tax expense than Non-U.S. Firms. We aim to evaluate the importance of these offsetting factors by testing the following hypothesis:

H2: For loss firm years, Non-U.S. Firms have less negative tax expense (that is, worse tax results) compared to U.S. Firms.

4. Study Design

This Section 4 sets forth our study design. All variables are defined in Table 1. ...

4.1. Model for Profit Firm Hypothesis

We test H1, about effective tax rate experience in Profit Firm Years, with an ordinary least squares (OLS) regression. The model follows:

$$\text{ETR outcome}_{it} = \beta_0 + \beta_1 (\text{Non-U.S. Firm})_{it} + \beta_k (\text{Controls})_{it} + \varepsilon \quad (1)$$

Hypothesis 1 predicts that β_1 is negative and significant for all ETR measures for Profit Firm Years. Such a result would reflect better effective tax rate results for Non-U.S. Firms compared to U.S. Firms.

Our primary dependent variable is total Book ETR at time t , where t is the year for which the firm year data is observed. We also test for Cash ETR at time t and examine whether tax savings manifest over time with the Three-Year Long-Run Cash ETR from $t+1$ to $t+3$.

We use these cash ETR measures in addition to Book ETR measures to examine whether a firm's tax savings experience as recorded for financial accounting purposes also translates to cash savings. For example, temporary differences that affect Book ETR should not similarly affect cash ETR measures. (Hanlon & Heitzman (2012)). We use the Three-Year Long-Run Cash ETR measure, in addition to the annual Cash ETR measure, to examine whether a firm's tax savings experience is transitory and visible only in annual reporting, for example because of an unusual event that occurs in a particular year, or whether it persists. (Dyreng et al. 2008).

We control for other variables previously found to influence effective tax rates (e.g. Dyreng & Lindsey (2009), Desai & Hines (2002)): Log of Sales, Percentage of Non-U.S. Sales, Pre-Tax Return on Sales, Leverage, R&D Expense, Advertising Expense, NOL Present, Industry (2-digit SIC code) and Year (together, "Controls").

In addition we address the issue of correlated firm errors by running all regressions using standard errors clustered by firm.³

4.2. Model for Loss Firm Hypothesis

We test H2, about effective tax rate experience in loss firm years, with an OLS regression. The model follows:

$$\text{Book ETR}_{it} = \beta_0 + \beta_1 (\text{Non-U.S. Firm})_{it} + \beta_k (\text{Controls})_{it} + \varepsilon \quad (2)$$

³ The results are robust to clustering by year, and two way clustering by firm and year.

For this testing, we modify the calculation of the independent variable to reflect that if a firm in a loss year records a larger negative tax expense, it has a better tax result. The conventional presentation divides a negative tax expense by a firm's negative book income, which yields a positive tax rate. This approach suggests that if a firm, say a U.S. Firm, has a negative tax expense that is larger in absolute value, it has higher tax rate. We prefer to show the converse, or in other words to signal that if a firm has a negative tax expense that is larger in absolute value, it has a better tax result. As a result for loss firm years Book ETR_t is calculated by multiplying the loss firms' GAAP effective tax rate (defined above) by negative 1 in order to show a lower (i.e., more negative) ETR if a firm has a larger negative tax expense relative to its book loss.

As an example, Cal Dive International, Inc. is a U.S. Firm that recognized a pre-tax book loss of about \$93 million for the year ended December 31, 2012. It reported a U.S. loss of about \$101 million and foreign income of about \$8 million in that year, and recorded negative U.S. income tax expense and positive foreign income tax expense. Its overall negative tax expense was about \$25 million. (10K at ___) The conventional presentation would show this firm's tax rate as about 27%, but we show it as about *negative* 27%. In comparison, Vantage Drilling Company is a Non-U.S. Firm that recognized a pre-tax book loss of \$68 million for the year ended 2011, but a positive tax expense of about \$11 million. (10K at 47). We would report that as a *positive* ETR of about 17%. Our presentation is intended to convey a better tax result for Cal Dive International than for Vantage Drilling, as measured by Book ETR.

Hypothesis 2 predicts that β_1 is positive and significant for Book ETR. We restrict the analysis to Book ETR for Loss Firm Years due to the high frequency of missing cash taxes paid for these firms. If our hypothesis is correct, the Book ETRs of Non-U.S. Firms in Loss Firm Years will be less negative, and have a smaller absolute value, than the Book ETRs of U.S. Firms. Such a result would reflect the accrual of less negative tax expense for Non-U.S. Firms compared to U.S. Firms.

4.3. Sample Construction

Table 2 documents our sample construction. We begin by identifying all publicly traded firms in the COMPUSTAT fundamentals annual database with fiscal years beginning on or after January 1, 1999 and ending on or before December 31, 2014. We begin the sample in 1999 because we require firms to have geographic segment data available. This results in the identification of 182,161 firm years and 23,791 unique firms. We next impose screens that exclude, inter alia, small firms, investment funds, and firms missing information needed to construct the other variables.

We require that a firm exhibit evidence of multinational activity, as the ability to tax plan between jurisdictions is an assumption underlying our hypotheses. We code a firm as multinational if it reports Non-U.S. Segment Sales, meaning a non-U.S. geographic segment in the COMPUSTAT database for at least one of the firm years reported for a firm. We also require firms in our sample to have Non-U.S. Segment Sales in order to populate the Percentage of Non-U.S. Sales, which we use as a control variable.

To obtain our total sample, we further restrict this multinational sample to include only firms with Material U.S. Presence, as we are interested in the different incorporation decisions made by firms with U.S. headquarters or material operations in the United States. We limit our sample to firms that list a U.S. headquarters location (LOC=USA) in COMPUSTAT and/or disclose more than 25% United States, North America or Americas sales, property plant and equipment, or employees in more than 25% of available firm years, each as reported by the COMPUSTAT geographic segment database. Our approach to segment disclosure is discussed in more detail below. After these screens, as shown in Table 2, panel A, our total sample consists of 36,891 firm years and 4,883 unique multinational firms.

Non-U.S. Firms are the group of decentered firms within total sample that we collect. All of the firms in our total sample have met screens for multinational activity and material U.S. operations. Those firms that meet our definition of firms with parents incorporated outside the U.S. are coded as Non-U.S. Firms for purposes of our tests.

As shown in Table 2, panel B, our data for Non-U.S. Firms include 5,865 firm years and 683 unique firms. Non-U.S. Firms that are coded as having material U.S. operations because they list a U.S. headquarters location (LOC=USA) in COMPUSTAT yield 637 firm years and 87 unique firm observations. Non-U.S. Firms that are coded as having material U.S. operations because they disclose more than 25% United States, North America or Americas sales, property plant and equipment, or employees in more than 25% of available firm years yield 5,228 firm years and 596 unique firm observations.

Table 2, Panel C also identifies the observations in our sample that are Inversion Firms, or Non-U.S. Firms that have been publicly reported to have undergone an inversion transaction. We further discuss Inversion Firms below in Section 6.1.

4.4. Segment Coding

Since 1999, firms have been required to disclose geographic segment information unless “impracticable” under Financial Accounting Standard 131. FASB (2008) We rely on this geographic segment data, as reported by COMPUSTAT, in three respects. First, we require the firms in our total sample (and thus in all of our subsamples) to have Non-U.S. Segment Sales in at least one year that the firm appears in our sample. Second, we use Non-U.S. Segment Sales to construct the variable Percentage of Non-U.S. Sales, which proxies for the relative intensity of non-U.S. operations. Third, we use segment data on sales, property plant and equipment, and employment to identify Non-U.S. Firms, which are the decentered firms that interest us in this study.

Using Non-U.S. Segment Sales as a screen yields a measure of multinational activity that is similar to the definition used Dyreng and Lindsey (2009). Those authors require nonzero foreign income tax or nonzero pre-tax foreign income in at least one year. We find (in untabulated results) that of the 52,330 firm years omitted from our total sample because of missing non-U.S. sales segment data, about 76% also do not show nonzero foreign income tax or non-zero pre-tax foreign income in any year. The segment sales screen may cause us to eliminate some firms that

find it impracticable to report geographic segments, even though these firms might otherwise fit the definition of a multinational firm. Examples include ocean shipping and satellite firms, which may not divide their international operations according to jurisdiction; and insurance firms that incorporate outside the United States but insure primarily U.S. risks.

We also use geographic segment information to build our data set of Non-U.S. Firms. Each Non-U.S. Firm is decentered, since each such firm is incorporated outside the U.S. and shows evidence of material U.S. operations. We consider a firm to have material U.S. operations if it records LOC = USA in COMPUSTAT, which reports a U.S. headquarters location. We also consider a firm to have material U.S. operations if it discloses more than 25% U.S. sales, property plant and equipment, or employees in its geographic segment disclosure, in any case in at least 25% of available firm years. We code a segment as U.S. if the segment name starts with the label “United States.” Because of the dominant size of the United States economy, we also code a segment labeled “North America” or “Americas,” as “U.S.” unless there is a separate “United States” segment or the segment labeled “North America” or “Americas” also lists a geographic area not within North or South America.⁴

4.5. Data limitations

The sample does not include firms with material U.S. operations that are not traded in the United States. There is some concern that onerous SEC or other regulation might cause some U.S.-centered firms to avoid the U.S. public equities market in favor of a non-U.S. public equities market. (e.g. Litvak (2007)) However, we are not aware of a general move away from U.S. trading for U.S.-centered firms, despite specific examples such as the public offering decisions made by certain online gambling firms prior to U.S. state regulation of such firms. (Hurt (2003)) Even if the sample fails to include some non-U.S. incorporated firms with material U.S. operations that are not traded in the U.S., we do not think it would disproportionately exclude firms less likely to engage in tax planning. Our analysis of effective tax rate results for Non-U.S. Firms and U.S. Firms that are traded in the U.S. should provide valid tests of the hypotheses we aim to investigate.

An assumption that the United States is the default jurisdiction of incorporation for a firm with material U.S. operations helps to motivate our analysis. This assumption supports the use of U.S. Firms as our baseline group and Non-U.S. Firms as our group of interest. The assumption is consistent with a body of related corporate governance literature that finds a largely binary incorporation location choice between the home state and Delaware for U.S. firms. (Bebchuk and Cohen, 2003). There is as yet no global substitute for the Delaware alternative (Broughman, Fried and Ibrahim, 2014). Although the separation of jurisdiction of incorporation and center of operations is routinely observed for firms operating in some jurisdictions, notably China, we do not know of evidence suggesting that a large proportion of U.S.-centered firms incorporate outside the United States. (Allen and Morse (2013))

⁴ We also run the analysis with a more restrictive definition of material U.S. operations - more than 50% United States, North America or Americas sales, property plant and equipment, or employees in more than 50% of available firm years. The results are substantially the same. The main difference with the less restrictive screen is that it expands our sample of Non-U.S. Firms and Inversion Firms. For example, the less restrictive screen that we use in the main analysis includes 50 Inversion Firms while the more restrictive screen includes 38 Inversion Firms.

5. Results

In this Section 5, we provide descriptive statistics for Non-U.S. Firms as compared to U.S. Firms in our sample. We also provide our main result. Some of the descriptive statistics show variation among firms in their status as Inversion Firms and in the geographic location where the parent is incorporated. We consider Inversion Firms and different geographic subgroups, as well as possible mechanisms for our main result for Profit Firm Years and Loss Firm Years, in additional testing in Section 6.

5.1. Descriptive Statistics

Table 3 shows the incorporation location of 4,884 unique firms by country. About 14% of our total sample are Non-U.S. Firms. Canada is the most popular jurisdiction for U.S.-centered firms incorporated outside the United States. Canada Firms make up about 4% of our total sample. Non-Canada, Non-Tax Haven Firms, such as firms with parents incorporated in Israel or the United Kingdom, make up about 6.5% of our sample. Tax Haven Firms, including firms with parents incorporated in Ireland, make up 3.4% of our sample. In untabulated results, we find that the percentage of each geographic type as a subset of Non-U.S. Firms has changed only slightly over time.

Table 4 breaks down our sample by industry, as shown by 2-digit Standard Industry Classification, or SIC, code. The sample has relatively high numbers and proportions of Non-U.S. Firms in the insurance sector (18 out of 46, or about 39%, in SIC code 63), in the oil and gas sector (27 out of 119, or about 23%, in SIC code 11) and in the chemical sector, including pharmaceuticals (80 out of 422, or about 19%, in SIC code 28).

These industry sectors vary more when it comes to numbers and proportions of Inversion Firms. For example, in the oil and gas sector, 11 out of 119, or about 9%, are Inversion Firms. In the chemical sector, 10 out of 422, or about 2%, are Inversion Firms. We further discuss Inversion Firms in Section 6.1.

Several other industries might have been expected to be important in our samples of Non-U.S. Firms and/or Inversion Firms, but we do not observe their relative importance in the Table 4 data. The electronic equipment and business services (including software) sectors show relatively high numbers of incorporated-abroad observations, but these figures do not translate to unusually large percentages of incorporated-abroad observations due to large denominators in these sectors. Also, deep-sea water transportation and insurance have been identified as two industries that had an unusually high representation of decentered firms among firms conducting initial public offerings. (Allen and Morse (2013)) Our sample here highlights different firms, perhaps because it is restricted to firms that report geographic segment information, which marine transportation and U.S.-focused insurance firms may not provide. For example, the low representation of the insurance industry among the Inversion Firms in our sample may proceed from our requirement that all the firms in our sample have Non-U.S. Segment Sales. A firm with a parent incorporated outside the U.S. that only insures U.S. risks, for example, might not show any Non-U.S. Segment Sales.

Univariate descriptive statistics are presented in Table 5. Panel A shows the statistics for Profit Firm Years and panel B shows the statistics for Loss Firm Years. We also report descriptive statistics for Inversion Firms and Non-U.S. Firms depending on the jurisdiction of incorporation in Parts 6.1 and 6.2, below.

Among the multinationals with material U.S. operations that make up our total sample, Non-U.S. Firms are generally larger than U.S. Firms. We proxy for firm size using the Log of Sales.

Non-U.S. Firms also have a greater intensity of foreign operations than U.S. Firms, as proxied by the Percentage of Non-U.S. Sales variable. This result is statistically significant for both Profit Firm Years and Loss Firm Years regardless of the jurisdiction of incorporation.

For Profit Firm Years, Non-U.S. Firms show a small but statistically significant greater profitability (as measured by Pre-Tax Return on Sales) compared to U.S. Firms. In contrast, for Loss Firm Years, Non-U.S. Firms show lower Pre-Tax Return on Sales compared to U.S. Firms.

The univariate results suggest that Non-U.S. Firms have better tax results in Profit Firm Years, meaning that Non-U.S. Firms record less positive tax expense in Profit Firm Years compared to U.S. Firms. For Loss Firm Years, the univariate descriptive statistics suggest that Non-U.S. Firms have worse tax results, meaning that Non-U.S. Firms record less negative tax expense in Loss Firm Years compared to U.S. Firms.

Table 6 provides the correlation matrix. The relationships are consistent with what we observe in the univariate tests. For instance, for Profit Firm Years, status as a Non-U.S. Firm is generally negatively correlated with all three tax outcomes (indicating a better tax result for Non-U.S. Firms), and positively associated with the loss year outcome (indicating worse tax results for Non-U.S. Firms).

5.2. Main Results

Our hypothesis 1 proposes that, for Profit Firm Years, Non-U.S. Firms have less positive tax expense, as shown by lower effective tax rates, compared to U.S. Firms. Our regression results are consistent with this hypothesis. Table 7 shows that Non-U.S. Firms have lower Book ETR, by 5 percentage points; lower Cash ETR, by 3 percentage points; and lower Three-Year Long-Run Cash ETR, by 3 percentage points.

Our hypothesis 2 proposes that, for Loss Firm Years, Non-U.S. Firms have less negative tax expense as compared to U.S. Firms. Due to data limitations, we only test the Book ETR dependent variable for this hypothesis. Our regression results support this. As Table 7 shows, Book ETR is higher in Loss Firm Years for Non-U.S. Firms by 2 percentage points.⁵

⁵ Recall that we show Book ETR for Loss Firm Years by dividing pre-tax income by total tax expense, and then multiplying by negative 1. This means that if a firm records less negative tax expense, we show its Book ETR as less negative, or higher.

In summary, Non-U.S. Firm Status appears to offer the opportunity for tax savings when a firm generates profits. However, U.S. Firm Status is correlated with greater tax benefits in loss firm years. In Sections 6.3 and 6.4, below, we attempt to identify the mechanisms that drive these results and to determine whether these results vary with certain subgroups of firms.

6. Additional Analysis

In this Section 6, we provide the results of additional testing that investigates the effective tax rate experience of Inversion Firms and of different geographic subgroups of Non-U.S. Firms. We also investigate possible mechanisms for our main result for profit and loss years.

6.1. Inversion Firms Compared to Other Non-U.S. Firms

In the testing for our main results, we do not differentiate among Non-U.S. Firms based on how they came to have a non-U.S. parent. The implicit assumption is that the effective tax rate experience of a Non-U.S. Firm compared to a U.S. Firm does not differ depending on how the Non-U.S. Firm came to have a non-U.S. parent. But firms' histories differ. In some cases, a Non-U.S. Firm may have a non-U.S. parent corporation from its beginning. In this case, the operations of the business may have started outside the U.S., and then grown organically until a material portion of the business is in the U.S. In other cases, a non-U.S. parent may replace a U.S. parent in a corporate structure at a later point in the corporation's life, for example in connection with a buyout transaction; a stand-alone inversion transaction; or a merger transaction. (Rao (2015))

Income tax savings motivations are often reported to be important reasons why a firm would accept the expense of such an "inversion" or "redomiciliation" transaction (Mider & Drucker (2016), Marples & Gravelle (2014)). It is possible that Non-U.S. Firms that come to have their non-U.S. parents as a result of inversion transactions experience better tax results than other Non-U.S. Firms. Perhaps a firm that undertakes the expense of an inversion transaction is particularly well suited to take advantage of the generally available tax savings strategies. Or perhaps such a firm is more aggressive or savvy than other firms. (Slemrod (2004))

We address this possibility in this study by gathering a subsample of Inversion Firms, or Non-U.S. Firms that have been publicly reported to have undergone an inversion transaction. We divide our full sample of Non-U.S. Firms into Inversion Firms, on one hand; and Other Non-U.S. Firms, on the other hand. We then investigate whether the income tax experience of Inversion Firms is different than that of Other Non-U.S. Firms.

We hypothesize that for both profit and loss firm years, Inversion Firms have lower effective tax rates (that is, better tax results) than Other Non-U.S. Firms. We test the hypothesis that Inversion Firms will show better effective tax rate results with the following model:

$$ETR_{it} + \varepsilon = \beta_0 + \beta_1 (\text{Non-U.S. Firm})_{it} + \beta_2 (\text{Non-U.S. Firm} * \text{Inversion Firm}) + \beta_k(\text{Controls}) \quad (3)$$

We hypothesize that β_2 is negative and significant for ETR outcomes in Profit Firm Years and Loss Firm Years. This would reflect better effective tax rate results for Inversion Firms as compared with Other Non-U.S. Firms, consistent with the idea that Inversion Firms are particularly tax savvy or tax motivated.⁶

In testing this hypothesis, we use the same Controls that we use in hypothesis 1 and hypothesis 2.

To identify Inversion Firms, we use lists of inversions available from a frequently updated media report (Mider & Drucker (2016)) and a government report (Marples & Gravelle (2014)) to compile a list of firms that have undergone an inversion transaction that replaced a U.S. parent with a non-U.S. parent. There is substantial overlap between our sample and the sample compiled by Rao (2015); only one firm appears in the Rao data set and not in ours, and that firm lacks the segment data we require to run our tests. As Table 2, Panel C shows, the two lists that we use provide a total of 105 unique firms that have undergone an inversion. Of these, we match 48 to firms in the total sample constructed in Table 2, Panel A.⁷

As shown in the descriptive statistics reported in Table 8, Inversion Firms are larger than Other Non-U.S. Firms. However, Inversion Firms do not show a systematic difference in the intensity of foreign operations or profitability compared to Other Non-U.S. Firms. Inversion Firms have more Leverage than Other Non-U.S. Firms. Leverage measures external firm leverage but may perhaps indicate some ability of the firm to earnings strip using internal firm leverage (Desai & Hines (2002)).

However, as also shown in Table 8, Inversion Firms show no statistically significant difference in the univariate data for any of the ETR results compared to Other Non-U.S. Firms, when separated into Profit Firm Years and Loss Firm Years. This result is confirmed in Table 9, which shows the results of the regression that compares the effective tax rate results of Inversion Firms and Other Non-U.S. Firms. Adding the Inversion Firm interaction variable produces no statistically significant difference in for any of the effective tax rate results, in either Profit Firm Years or Loss Firm Years.⁸ Thus our results do not support our hypothesis that Inversion Firms have lower effective tax rates (that is, better tax results) than Other Non-U.S. Firms.

⁶ We do not decompose our group of Non-U.S. Firms into geographic subgroups for our testing of this hypothesis due to the small number of inversion firms in the sample. However, in untabulated results, we run the test separately for the three geographic subgroups (Canada Firms; Non-Canada, Non-Tax Haven Firms; and Tax Haven Firms). Untabulated results show that the separate results for Tax Haven Firms are substantially the same as the main testing results. This is unsurprising, as 75% of Inversion Firms have parents incorporated in a tax haven.

⁷ In untabulated results, we identify reasons why firms identified as firms that have undergone an inversion are not included in our data set. The three largest contributors are: (1) identified firms do not appear in the starting sample shown in the first line of Table 3, Panel A (21 firms), (2) identified firms have not inverted before the end of our sample period (13 firms), (3) identified firms do not show non-U.S. sales in segment disclosure ([9] firms).

⁸ In untabulated results, we run a comparison between Other Non-U.S. Firms and Inversion Firms using another approach. We make a parallel comparison, first finding the difference in effective tax rate experience of Other Non-U.S. Firms compared to U.S. Firms and then finding the difference in the effective tax rate experience of Inversion Firms compared to U.S. Firms. This comparison initially suggests that Inversion Firms have slightly better tax results than Other Non-U.S. Firms in Profit Firm Years and slightly worse tax results than Other Non-U.S. Firms in Loss Firm Years. But these differences do not hold up when we test for equality of coefficients. F-test results shows no statistically significant difference in the coefficients of Other Non-U.S. Firms and Inversion Firms when each is compared respectively to U.S. Firms.

6.2. Different Non-U.S. Incorporation Locations

In testing for our main results, we do not differentiate between Non-U.S. Firms based on their incorporation location. However, such firms may incorporate a non-U.S. parent in various different non-U.S. jurisdictions. The choice of jurisdiction has non-tax as well as tax implications (Kane & Rock 2008). For example, prior work has found that geographic proximity strengthens economic ties including cross-border trade (Frankel & Romer (1999)) and merger activity (Ahern et al. (2015)). Consistent with this work, a multinational with material U.S. operations that is incorporated in certain jurisdictions that have strong economic ties, including trade ties, to the United States (e.g., Canada) might incorporate there more because of non-tax economic and business reasons and less because of tax planning.

Prior work has also found that certain countries are attractive “tax havens” because of a combination of factors including low tax rates and strong rule of law commitments (Dharmapala & Hines (2009)). Prior literature has also found that a multinational firm’s tax haven operations can reduce effective tax rates (Dyreng & Lindsey (2009); (Markle & Shackelford (2014)). Consistent with this work, a multinational might choose a parent incorporated in a tax haven more because of tax planning and less because of non-tax economic and business reasons.

Because of these different considerations for firms incorporated in different locations, we perform additional testing separately for three geographic groups of Non-U.S. Firms. We use three subgroups of Non-U.S. Firms. Canada Firms have parents incorporated in Canada (“Canada Firms”). Non-Canada, Non-Tax Haven Firms have parents incorporated in a non-U.S. jurisdiction that is neither Canada nor a tax haven. Tax Haven Firms have with parents incorporated in tax havens.

We hypothesize that for Profit Firm Years, each group of Non-U.S. Firms – Canada Firms, Non-Canada, Non-Tax Haven Firms, and Tax Haven Firms -- have lower effective tax rates (that is, better tax results) than U.S. Firms. We hypothesize that for Loss Firm Years, each group of Non-U.S. Firms – Canada Firms, Non-Canada, Non-Tax Haven Firms, and Tax Haven Firms -- have higher effective tax rates (that is, worse tax results) than U.S. Firms.

We test these hypotheses by comparing firms in each geographic subgroup with U.S. Firms using the following model:

$$\text{ETR outcome}_{it} = \beta_0 + \beta_1(\text{Canada Firm})_{it} + \beta_2(\text{Non-Canada, Non-Tax Haven Firm})_{it} + \beta_3(\text{Tax Haven Firm})_{it} + \beta_k(\text{Controls})_{it} + \varepsilon \quad (4)$$

The descriptive statistics provided in Table 8 show that the size difference between Canada Firms is and US Firms is not statistically significant. However, Non-Canada, Non-Tax Haven Firms and Tax Haven Firms are generally bigger than U.S. Firms. Non-U.S. Firms have greater intensity of foreign operations, greater profitability, and greater leverage regardless of the geographic subgroup. The descriptive statistics that suggest these results are stronger for Profit Firm Years.

Table 8, Panel A also provides univariate statistics that suggest that for Profit Firm Years, the effective tax rate for each geographic subgroup of Non-U.S. Firms is lower than for U.S. Firms. Table 8, Panel B suggests that for Loss Firm Years, the effective tax rate for each geographic subgroup of Non-U.S. Firms is higher than for U.S. Firms. These results are generally consistent with the regression results. However, as Table 10 shows, there are some nuances.

For Profit Firm Years, Table 10 shows that Canada Firms have lower Book ETRs by 3 percentage points; Non-Canada, Non-Tax Haven Firms by 5 percentage points, and Tax Haven Firms by 8 percentage points. Our strongest result for the cash effective tax rate measures is for Tax Haven Firms, which show lower Cash ETR by 5 percentage points compared to U.S. Firms and lower Three-Year Long-Run Cash ETR by 5 percentage points. Canada Firms also show lower Cash ETR, by 3 percentage points. Non-Canada, Non-Tax Haven Firms show no statistically significant difference in Cash ETR or Three-Year Long-Run Cash ETR for Profit Firm Years, when compared to U.S. Firms.

For Loss Firm Years, Table 10 shows that for Non-Canada, Non-Tax Haven Firms, Book ETR is higher (i.e., effective tax rates are worse) by a measure of 3 percentage points. For Tax Haven Firms, Book ETR is higher by a measure of 5 percentage points. Our results for Canadian firms show a lower Book ETR for Loss Firm Years (i.e., better tax results) by 2 percentage points.

We also run an f-test to determine the statistical significance of the difference between the coefficients for the different geographic subgroups. This test shows that the difference in coefficients indicating better effective tax rate results for Profit Firm Years are statistically significant as between Tax Haven Firms and either Canada Firms or Non-Canada, Non-Tax Haven Firms. It also shows that the difference in coefficients indicating effective tax rate results for Loss Firm Years are statistically significant as between Canada Firms and either Non-Canada, Non-Tax Haven Firms or Tax Haven Firms.

6.3. Profit Firm Years: Mechanism for Lower ETRs for Non-U.S. Firms

In Section 5.2, we reported that in Profit Firm Years, Non-U.S. Firms have better tax results compared to U.S. Firms. For instance, Book ETR is lower by 5 percentage points; Cash ETR is lower by 3 percentage points, and Three-Year Long-Run Cash ETR is lower by 3 percentage points. In Section 6.2, we reported that these results held across geographic groups, particularly for Book ETR. In this Section 6.3, we investigate possible mechanisms for this main result.

In Section 3 we discussed the different tax and accounting treatment of Non-U.S. Firms and U.S. Firms. Earnings stripping by Non-U.S. Firms and the worldwide U.S. tax law were two reasons why profitable Non-U.S. Firms might show lower effective tax rates compared to U.S. Firms. Earnings stripping by Non-U.S. Firms means that a U.S. subsidiary makes deductible payments, such as interest, to its non-U.S. parent. The worldwide U.S. tax system means that U.S. Firms

may accrue tax expense at the U.S. rate with respect to non-U.S. profit not designated as permanently reinvested earnings, or PRE.⁹

If our main result is due to the first reason, earnings stripping, then we should observe that Non-U.S. Firms have lower current tax expense, or Current ETR, compared to U.S. Firms. This is because earnings stripping lowers the taxable income allocated to the U.S. for the observed tax year and, in profit firm years generally thus lowers the tax payable to the U.S. The connection between earnings stripping and Current ETR is also supported by our Cash ETR and Three-Year Long-Run Cash ETR results. In general, these show lower cash tax rates for Non-U.S. Firms. This supports the premise that earnings stripping produces cash tax savings and lower Current ETR.

If our main result for profit firm years is due to the second reason, worldwide taxation, then we should observe that U.S. Firms have higher deferred tax expense, or Deferred ETR, compared to Non-U.S. Firms. This is because the additional tax expense recorded by U.S. Firms with respect to non-U.S. profit not designated PRE. Typically, this non-U.S. profit will not be currently repatriated (even though it is not designated PRE), because the repatriation often will trigger the requirement to pay U.S. cash taxes. Also, this non-U.S. profit will not be currently taxed as subpart F income, because U.S. Firms are adept at minimizing their taxation under the subpart F antideferral rules. Instead, the additional tax expense recorded by the U.S. Firm will be a deferred tax expense. The U.S. Firm records the expense in anticipation of a later repatriation of the non-U.S. profit.

We hypothesize that main result that Non-U.S. Firms have better tax results than U.S. Firms in Profit Firm Years is due to both the earnings stripping of Non-U.S. Firms and the application of worldwide taxation rules to U.S. Firms. We therefore predict that the Non-U.S. Firms will have lower Current ETR and lower Deferred ETR, as compared to U.S. Firms, for Profit Firm Years. , each group of Non-U.S. Firms – Canada Firms, Non-Canada, Non-Tax Haven Firms, and Tax Haven Firms -- have lower effective tax rates (that is, better tax results) than U.S. Firms.

We test this hypothesis by treating Current ETR and Deferred ETR as our ETR outcome variable and using model (1) above:

$$\text{ETR outcome}_{it} = \beta_0 + \beta_1 (\text{Non-U.S. Firm})_{it} + \beta_k(\text{Controls})_{it} + \varepsilon \quad (1)$$

We predict that the coefficient on Non-U.S. Firm status will be negative and significant for both Current ETR and Deferred ETR. We also follow up on our data regarding geographic subgroups in Section 6.2 and test this hypothesis for each subgroup of Non-U.S. Firms: Canada Firms, Non-Canada, Non-Tax-Haven Firms, and Tax Haven firms.

⁹ There is also the possibility that, even though we control for Percentage of Non-U.S. Sales, the Non-U.S. Firms have more non-U.S. operations subject to lower tax rates as compared to U.S. Firms. If this reason – greater intensity of foreign operations in Non-U.S. Firms – is responsible for the lower ETR results for Non-U.S. Firms, we would expect that the results would be weaker when we divide our sample into quintiles, where each quintile includes observations with similar intensity of foreign operation as proxied by Percentage of Non-U.S. Sales. However, in untabulated results, we find that within each such quintile we still observe differences in the ETR results for Non-U.S. Firms and U.S. Firms that are generally consistent with those shown in the sample as a whole.

Table 11, Panel A provides descriptive statistics. Non-U.S. Firms show Current ETR that is smaller by four percentage points compared to U.S. Firms, and Deferred ETR that is smaller by two percentage points compared to U.S. Firms. The results for each geographic subgroup are generally consistent, with the exception of the Deferred ETR results for Canada Firms. Thus the descriptive statistics provide initial support for our hypothesis that the earnings stripping and worldwide taxation effects both contribute to our main result of better tax results for Non-U.S. Firms in Profit Firm Years.

The OLS regressions reported in Table 11, Panel B corroborate this. They show that of the overall Book ETR difference of 5 percentage points, 4 percentage points are attributable to Current ETR and 1 percentage point is attributable to Deferred ETR. This results persists across geographic subgroups, with the exception of Deferred ETR for Canada Firms.

We further test the connection among our main result, worldwide taxation, and higher Deferred ETR for U.S. Firms. We use the Audit Analytics database to construct a subset of observations in our sample that report whether or not any PRE is recorded. As Table 11, Panel C shows, these firms show roughly similar Current ETR and Deferred ETR results when compared with the larger sample. The OLS regressions presented in Table 11, Panel D show that in the subsample of firms that offer information about the recording of PRE, Non-U.S. Firms have a Current ETR that is lower by 3 percentage points and a Deferred ETR that is lower by 2 percentage points, each when compared to U.S. Firms.

As Table 11, Panel E shows, when we compare the U.S. Firms that do not record any PRE with Non-U.S. Firms, we observe a large difference in Deferred ETR, of about 4 percentage points. In contrast, and as shown in Table 11, Panel F, when we compare the U.S. Firms that record any PRE with Non-U.S. Firms, we observe no statistically significant difference in Deferred ETR, except for Tax Haven Firms, where there is a difference of 2 percentage points. These results provide additional support for the hypothesis that worldwide tax rules applicable to U.S. Firms, which support the recording of tax expense on non-U.S. income not designated PRE, drives the observed difference in Deferred ETR.

6.4. Loss Firm Years: Mechanisms for Different ETR Results for Non-U.S. Firms

In Section 5.2, we reported that in Loss Firm Years, Non-U.S. Firms have better tax results compared to U.S. Firms. Book ETR is lower by 2 percentage points. In Section 6.2, we reported that this result is driven by the experience of Non-Canada, Non-Tax Haven Firms and Tax Haven Firms. These groups show lower Book ETR in Loss Firm Years by 3 percentage points and 5 percentage points, respectively. In this Section 6.4, we investigate possible mechanisms for this main result.

In Section 3 we discussed the different tax and accounting treatment of Non-U.S. Firms and U.S. Firms. Earnings stripping by Non-U.S. Firms is a reason why Non-U.S. Firms might show better tax results in both Profit Firm Years and Loss Firm Years. But in the case of Loss Firm Years, there are also two additional reasons why Non-U.S. Firms might show worse tax results. One

reason is that the worldwide tax system applicable to U.S. Firms may result in better tax results in Loss Firm Years, even though it results in worse tax results in Profit Firm Years. This is because a U.S. Firm may record *negative* tax expense at the U.S. rate with respect to non-U.S. losses in Loss Firm Years. Another reason by Non-U.S. Firms might show worse tax results in Loss Firm Years is that Non-U.S. Firms' increased ability to allocate losses to the U.S. may mean that Non-U.S. Firms are more likely to be required to record a valuation allowance which limits their ability to record current negative tax expense and may reverse the negative expense recorded with respect to prior year losses (Allen (2015), Miller and Skinner (1996)).¹⁰

A challenge presented by our data set of Loss Firm Years is that it includes a large proportion of firms that record zero or positive tax expense. As shown in Table 12, Panel A, almost half of our Loss Firm Year observations record positive tax expense, which we present as a positive ETR.¹¹ About 13 percent have zero tax expense, and almost 40% of our Loss Firm Year observations record negative tax expense. Non-U.S. Firms have a greater percentage of years with positive tax expense and a lower percentage of years with negative tax expense. This is particularly true for Tax Haven Firms, which record a positive tax expense in 60% of Loss Firm Years.

This distribution is particularly concerning as our results reported in Section 5.2 and 6.2 relied on using a winsorized Book ETR for loss firm years between negative 100% and 0%. This winsorization affects almost half of our observations.¹² In particular, it constrains the 46% of U.S. Firm Loss Firm Years that show positive tax expense and the 51% of Non-U.S. Firm Loss Firm Years that show positive tax expense, reporting each instead as zero tax expense. Our winsorization approach could therefore provide an inaccurate picture of the effect of incorporation location on ETR in loss firm years. Consistent with the concern that winsorization affects our loss firm results, we find, in untabulated results, no statistically significant correlation between status as a U.S. Firm or Non-U.S. Firm and unwinsorized Book ETR.

We perform a series of supplemental analyses here to investigate what results we would find with an unwinsorized data set. Table 12, Panel B presents the univariate statistics of the unwinsorized Book ETR for the loss firms sample as a whole, as well as for each individual incorporation group. The loss firms that record a negative tax expense are located in the left tail of the distribution. For instance, Book ETR is -37% at p10 and -25% at p25. We also see preliminary evidence that, conditional on recording negative tax expense, U.S. Firms record larger negative tax expense compared to Non-U.S. Firms in loss years. For example, at p10/(p25) the Book ETR distribution for U.S. firms is -37%/(-14%) vs. -31%/(-7%) for Non-U.S. Firms. Tax Haven Firms and Non-Canada, Non-Tax Haven Firms in particular drive this result that U.S.

¹⁰ There is also the possibility that, even though we control for Percentage of Non-U.S. Sales, the Non-U.S. Firms have more non-U.S. operations subject to lower tax rates as compared to U.S. Firms. If this reason – greater intensity of foreign operations in Non-U.S. Firms – is responsible for the lower ETR results for Non-U.S. Firms, we would expect that the results would be weaker when we divide our sample into quintiles, where each quintile includes observations with similar intensity of foreign operation as proxied by Percentage of Non-U.S. Sales. However, in untabulated results, we find that within each such quintile we still observe differences in the ETR results for Non-U.S. Firms and U.S. Firms that are generally consistent with those shown in the sample as a whole.

¹¹ Recall that our presentation of effective tax rate data when a firm has a negative tax expense converts the sign of Book ETR, so that a firm with a negative tax expense shows as a firm with negative Book ETR in our data.

¹² Winsorization only affects 9% of our profit year observations.

firms have larger negative tax expense. Canada Firms report larger tax benefits compared to U.S. Firms at p10/(p25), with Book ETRs of -45%/(-17%).

We use quantile regression to check our results in different data ranges, where our data is arranged according to the unwinsorized Book ETR distribution. The OLS regression we use in our main result assumes that the relationship between independent and dependent variables is the same across the distribution. In contrast, quantile regressions show the relationship between Non U.S. Firm or U.S. Firm status and a Book ETR outcome variable conditional on a firm being located within a certain range of the Book ETR distribution. Quantile regression does not estimate the regression results based on subsamples of the data, but rather minimizes the difference between observed and predicted data points using a weighted approach. For instance, the quantile regression for the “p25” range of data produces the coefficient of a line for which 25% of the observations are below the line and 75% of the observations are above the line. (Armstrong et al. (2015))

Table 12, Panel C presents the results from our quantile regressions. Consistent with the univariate statistics, Non-U.S. Firm status is correlated with higher loss ETRs in the parts of the distribution where the firms record a negative tax expense. When we examine the individual incorporation groups we find that Non-Canada, Non-Tax Haven and Tax Haven Firms show worse Book ETR results in p10/(p25), as they respectively result in Book ETRs that are 8 percentage points/(2 percentage points) and 9 percentage points /(5 percentage points) higher than U.S. firms. These results show that the main result we report for Loss Firm Years, which is the correlation between Non-U.S. Firm status and worse tax results, is also present in unwinsorized data. The results suggest that the main loss firm result is driven by the Book ETR results among firms that record a negative tax expense.

In quantiles where Book ETR is zero or positive, the results are less systematic. As Table 12, Panel C shows, Tax Haven Firms still appear to have worse tax results than U.S. Firms in some portions of the zero and positive Book ETR spectrum. When tax expense is zero or positive, Canada Firms and Non-Canada, Non-Tax Haven Firms generally have results that are not statistically different from the results of U.S. Firms. For some quantiles, some geographic subgroups of Non-U.S. Firms show better tax results when compared to U.S. Firms. For instance, the Non-Canada, Non-Tax Haven Firms in the p90 quantile, representing the highest positive tax expense group, show positive tax expense that translates to a Book ETR that is five percentage points less than that of U.S. Firms. In summary, our main loss firm result is driven by U.S. firms recording larger negative tax expense. Variance in incorporation location has less of a correlation with ETR outcomes in the part of the distribution where the loss firm records a zero or positive tax expense. This may be related to valuation allowance practice which we discuss in further detail later.

We next offer further analysis on the mechanism that supports better tax results for U.S. Firms in the two-fifths of Loss Firm Years showing negative tax expense. Earnings stripping opportunities for Non-U.S. Firms suggest that Non-U.S. Firms could show larger negative tax

expense even in Loss Firm Years. But this is not the result we observe. We consider two possible reasons: worldwide taxation and valuation allowance practice.¹³

We first consider the possibility that U.S. Firms can record a larger negative tax expense because they have a greater ability than Non-U.S. Firms to record tax expense at a higher U.S. rate. This is supported by the U.S. worldwide taxation regime, as discussed in Sections 3.2 and 3.3. This result comes about if non-U.S. earnings earned by subsidiaries of the U.S. Firm are not designated as permanently reinvested earnings, or PRE, and would likely appear as a deferred tax expense.

In untabulated results, we find suggestive evidence that suggests that U.S. Firms do record negative tax expense with respect to non-U.S. losses. We extract a subsample of U.S. Firms with PRE data available based on the Audit Analytics database. We find that only 39.6% of the 3,602 loss firm years show a designation of PRE for the current year, compared with 62.6% of the 9,018 profit firm years. Also in untabulated results, we re-run our quantile regressions for two for two subsamples of firms. The first subsample compares the tax outcomes of U.S. Firms that do not designate PRE to Non-U.S. Firms. The second subsample compares the tax outcomes of U.S. Firms that designate PRE to Non-U.S. Firms. If we are correct and the increased negative tax expense for U.S. Firms is driven by their recording an incremental U.S. tax benefit on non-PRE non-U.S. losses, then we would expect our main result to be stronger for the first subsample.

Consistent with our prediction, the result is stronger for the subsample that only includes U.S. Firms that do not record PRE. In particular, the effect of U.S. Firms recording larger negative tax expense compared to Non-U.S. Firms is stronger in the first two quantiles, p10 and p25, where each firm records negative tax expense rather than zero or positive tax expense. This result has significance at the 5% level for Non-U.S. Firms as a group in both of the first two quantiles when we only include U.S. Firms that do not record PRE, but has statistical significance for only one of these quantiles when we compare all Non-U.S. Firms to U.S. Firms that do record PRE. We acknowledge that it is difficult to generalize this result because of the small number of Non-U.S. Firms, 157, in the subsamples. However, they do suggest that at least part of the result is driven by U.S. Firm's ability to record more negative tax expense, at the

¹³ It is also possible that U.S. Firms may simply have relatively more U.S. activity, including more U.S. loss, relative to their overall activity compared to Non-U.S. Firms. This could be true even considering the earnings stripping strategies that allow Non-U.S. Firms to claim more U.S. deductions for tax purposes. More U.S. loss would mean more loss tax-effected at the higher U.S. rate. Throughout our analysis in this paper, we control for Percentage of Non-U.S. Revenue, which proxies for intensity of U.S. and non-U.S. operations. But perhaps this control variable does not adequately capture the split of business activity between the U.S. and non-U.S. businesses of a firm.

To test the idea that we have not adequately controlled for intensity of U.S. and non-U.S. activity, we partition the sample in quintiles based on the Percentage of Non-U.S. Sales in each firm year. In untabulated results, we observe less negative tax expense in most individual quintiles, not just in the sample overall. In particular, in three of the five quintiles Tax Haven Firm status and Non-Canada, Non-Tax Haven Firm status is associated with smaller negative tax expense compared to U.S. Firms. This provides suggestive evidence that even where U.S. Firms and Non-U.S. Firms have similar relative amounts of U.S. and non-U.S. activity, the U.S. Firms still have larger negative tax expense.

higher U.S. rate on non-U.S. losses, because this ability of a U.S. Firm to record more negative tax expense is stronger for U.S. Firms that do not record PRE.¹⁴

Another possible mechanism for our main result is valuation allowance practice. Non-U.S. Firms' ability to claim negative tax expense may be more limited by valuation allowances relative to U.S. Firms. In particular, it may be that if Non-U.S. Firms more efficiently earnings strip, and erode the tax base allocated to their U.S. subsidiaries, then past U.S. income recorded and/or future U.S. income anticipated will be lower, and the firm will have less capacity to absorb the tax loss. In an extreme situation, a Non-U.S. Firm might earnings strip to such a degree that its U.S. subsidiary only generates losses, and would therefore not be able to recognize any tax benefit as the losses are trapped in the subsidiary. The Non-U.S. firm would then be more likely to record a valuation allowance, whether full or partial, to account for this limitation. This would result in a reduction of the magnitude of the negative tax expense associated with a loss.

We perform several analyses to see if this is the case. We follow the approach used in Dhaliwal et al. (2013) and classify a firm as a recording a valuation allowance if its deferred tax expense for the year it generates a loss was positive or is equal to zero.¹⁵ We acknowledge that this is a broad proxy, and only reflects the net effect of all deferred tax transactions. Importantly for our analysis, it will not classify a firm as having recorded an allowance if it only records a partial allowance that does not fully offset all of the deferred tax benefits, so that the firm still records a negative deferred tax expense. If the choice to record these partial allowances varies by incorporation location, that will not be reflected in our tests.

We first observe, in untabulated results, that of 8,101 loss firm years with sufficient data to be included in this sample,¹⁶ 57% of the firm years indicate the recording of a valuation allowance. We also find, in untabulated results, that there is variation in the propensity of U.S. Firms and Non-U.S. Firms to record a valuation allowance on a univariate basis. 57% of years for U.S. Firm, 49% for Canada Firms, 60% for Non-Canada, Non-Tax Haven Firms, and 50% of Tax Haven Firms are coded as recording a valuation allowance. However, only Canada Firms and Tax Haven Firms are different from the U.S. firms, and this significance is at the 10% level.

¹⁴ The idea that U.S. Firms that do not designate PRE can record tax expense on non-U.S. losses at the U.S. rate also interacts with the question of whether firms record a valuation allowance. If a U.S. Firm records a valuation allowance, it will not be permitted to record tax expense regardless of its PRE designation. We note that U.S. Firms without a PRE designation are more likely to record a valuation allowance; 56% of U.S. Firms that do not designate PRE record a valuation allowance (see note ___ for discussion of how we measure establishment of the valuation allowance), while 39% of U.S. firms that designate PRE record a valuation allowance.

To consider the interaction between valuation allowance, PRE designation, and the recording of tax expense at U.S. Firms, we again re-run our quantile regressions for U.S. Firms only. When all 3,602 U.S. Firms are included, non-designation of PRE has no association with the magnitude of the negative tax expense recorded by a U.S. firm. However, when we remove the firms that record a valuation allowance, we find that non-designation of PRE is associated with the U.S. Firms recording a larger negative tax expense. This result has significance at the 10% level.

¹⁵ We also run our tests with an alternative set of data that also codes a valuation allowance if a firm has a negative deferred tax expense exactly equal to positive current tax expense. The results are unchanged compared to the original specification used in the Dhaliwal et al. model.

¹⁶ For inclusion in our sample we require that the firms have data available to calculate all variables included in the regression model (defined in the appendix) from Dhaliwal et al. (2013). The sub sample includes 6,990 U.S., 1,111 Canada, 346 Non-Canada, Non-Tax Haven, and 507 Tax Haven firm years.

We run multivariate regression tests, also untabulated, using the model from Dhaliwal et al (2013) to further analyze the relationship between Non-U.S. Firm status and establishment of the valuation allowance.¹⁷ For the whole sample of loss firm years (regardless of whether a negative, zero, or positive tax expense is recorded in a firm year) we find that status as a Tax Haven Firm or status as a Non-Canada, Non-Tax Haven Firm is positively related to the recording of a valuation allowance, and Canada Firm status is negatively related. However, the estimated coefficient is not statistically different from zero for any incorporation group (or for Non-U.S. Firms as a single group).

While we find that incorporation is not related to establishment of the valuation allowance for the sample as a whole, we do find some correlation between Non-U.S. Firm status and the recording of a valuation allowance in alternate specifications. First we examine the subsample of firms who report a loss in one jurisdiction and profit in another.¹⁸ It is possible that the U.S.-parented structure makes it easier for a U.S. Firm to net losses in some jurisdictions, such as Non-U.S. jurisdictions, against profits in other jurisdictions, such as the U.S. If this is the case, then Non-U.S. Firms should be more likely to record a valuation allowance in loss firm years with a split profit and loss, that is, when a firm reports a profit/(loss) domestically and a loss/(profit) abroad. We find that of the 4,564 firms with sufficient information for inclusion in this analysis, 54% have a split profit and loss. Consistent with our prediction we find, in untabulated results, that within the subsample of firms who record the jurisdictional split, Tax Haven Firms are more likely to record a valuation allowance, with significance at the 10% level.

We also test whether there is variation of the result when we restrict the sample to firms with different percentages of years with a loss. It is likely that the greater history of losses a firm exhibits the more likely that a firm will record a valuation allowance regardless of its status as a Non-U.S. Firm. In other words, we expect the higher the percentage of years with a loss, the less likely there is to be variation in the establishment of a valuation allowance with incorporation location. Consistent with this prediction, we find that when we restrict the sample to firms with 20% or 30% percent of loss years in the number of years preceding and including the valuation allowance year, Tax Haven Firms are more likely to record an allowance, with significance at the 10% level. However, there is no statistically significant variation in valuation allowances recorded for Non-U.S. Firms (or any subgroup) when the sample is expanded to firms that experience a loss in the majority (over 50%) of the preceding years.

Finally, we re-run our main analyses after removing firms that are indicated as having recorded a valuation allowance. If a greater propensity to record valuation allowances drives our main loss firm result, we would expect that Non-U.S. Firms would not show smaller negative tax expense

¹⁷ Specifically we use the following model (all variables as defined in Dhaliwal et al (2013)):

$$VALALLOW_{it} = \beta_0 + \beta_1 Non - U.S. Incorporation_{it} + \beta_2 EARNINGS_{it} + \beta_3 CASHFLOW_{it} + \beta_4 |\Delta EARNINGS|_{it} \\ + \beta_5 NEGSPIW_{it} + \beta_6 NEGNOP_{it} + \beta_7 NEGGSLIS_{it} + \beta_8 NEGGLCF_{it} + \beta_9 SALES GROWTH_{it} \\ + \beta_{10} AGE_{it} + \beta_{11} R\&D_{it} + \beta_{12} FIRSTLOSS_{it} + \beta_{13} LOSSEQ_{it} + \beta_{14} BIGLOSS_{it} + \beta_{15} SIZE_{it} \\ + \beta_{16} DIVDUM_{it} + \beta_{17} DIVSTOP_{it} + \mu_{it}$$

We also re-run with individual incorporation variables as in the main analysis.

¹⁸ We make this determination by examining the subsample of firms who report a non-missing pre-tax domestic (PIDOM) and pre-tax foreign (PIFO) in Compustat. A firm is included in this subsample if in the year it generates and overall loss, one of PIDOM/(PIFO) is greater than zero and the other is less than zero.

when we remove valuation allowance firms. But in contrast, and in untabulated results, we find Non-U.S. Firms overall still report significantly smaller negative tax expense in loss years when we only examine firms without valuation allowances.

In summary, while we find weak evidence that some Non-U.S. Firms are more likely to record a valuation allowance in certain sub-samples, we cannot conclude that our main loss firm result, which is that Non-U.S. Firms record less negative tax expense in loss years, is driven by the Non-U.S. Firms' increased propensity to record valuation allowances.

7. Conclusion

Our study of multinational firms with material U.S. operations has considered two contrasting firm structures. The U.S. Firm structure features a U.S.-incorporated parent corporation and the Non-U.S. Firm structure has a non-U.S.-incorporated parent corporation. When firms are profitable, U.S. Firms show larger positive tax expense, meaning worse tax results, for both book and cash tax expense measures. For instance, Book ETR is higher for U.S. Firms in Profit Firm Years by 5 percentage points. When firms are loss-making, U.S. Firms show larger negative book tax expense, meaning better tax results. Book ETR is lower for U.S. Firms in Loss Firm Years, by 2 percentage points.

There is no statistically significant difference if a Non-U.S. Firm has undergone an inversion transaction. Also, our results generally hold for different geographic subgroups of Non-U.S. Firms, although they are generally strongest for Tax Haven Firms and weakest for Canada Firms. Additional testing suggests that earnings stripping opportunities for Non-U.S. Firms and worldwide taxation rules applicable to U.S. Firms contribute to the main result for Profit Firm Years. We also find suggestive evidence that worldwide taxation rules and valuation allowance practice support our result in Loss Firm Years.

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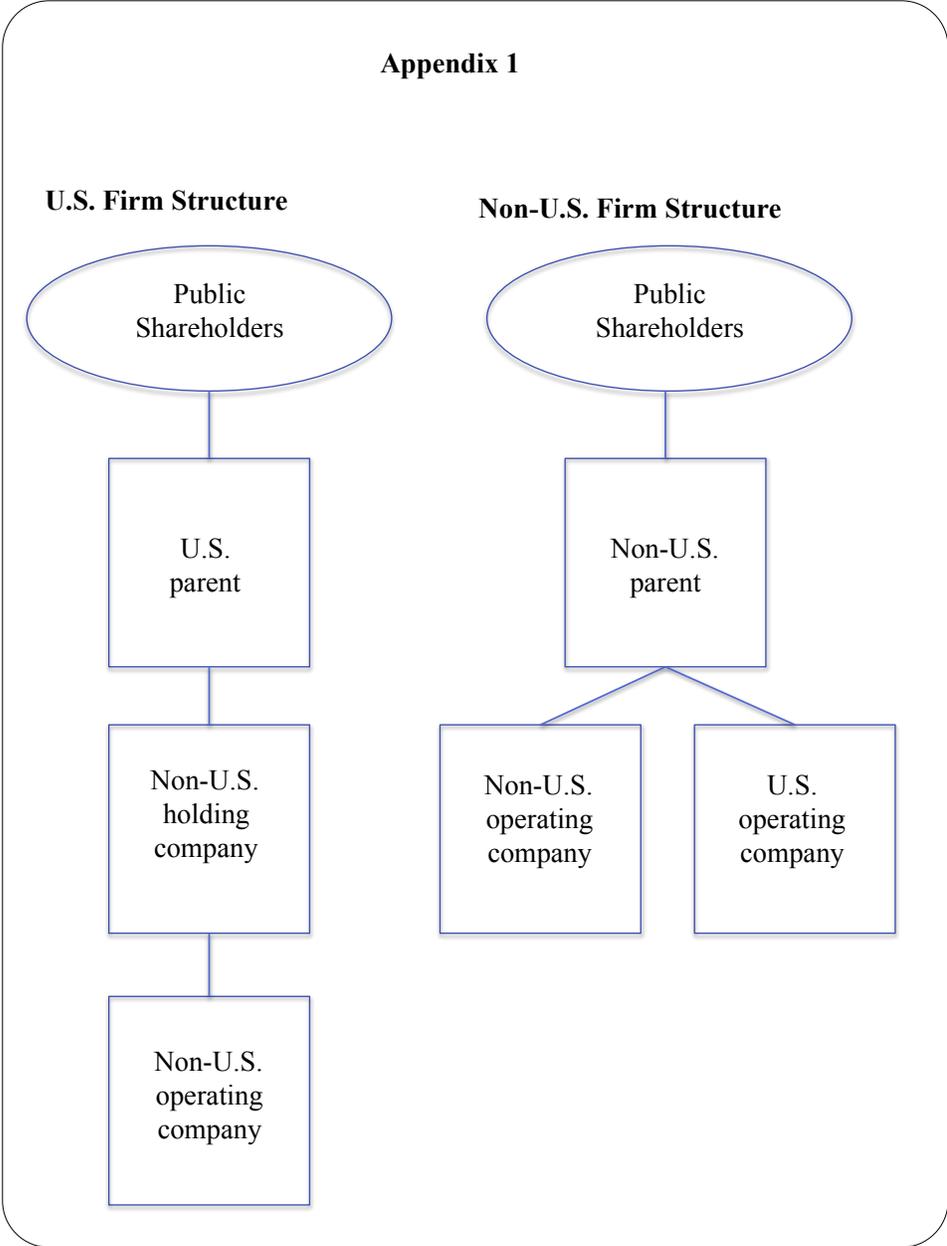
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Appendix 1: Non-U.S. Firm and U.S. Firm Diagram



Tables

Table 1: Variables

Variable Name	Proxies For	Calculated As ¹⁹
Advertising Expense	Value of trademark/brand	Advertising expense/total sales = XAD/SALE. If XAD is missing, then XAD = 0
Book ETR	Tax planning efficiency	If pre-tax income (PI) >= 0 = total tax expense / pre-tax income = TXT/PI. Results < 0 set equal to zero. Results > 1 set equal to 1. For firms with PI < 0 Book ETR is multiplied by -1.
Canada Firm		Non-U.S. Firm with FIC = Canada
Cash ETR	Tax planning efficiency	If pre-tax income (PI) >= 0 = taxes paid/pre-tax income = TXPD/PI. Results < 0 set = 0. Results > 1 set = 1.
Current ETR	Contribution of earnings stripping to ETR difference	If pre-tax income (PI) >= 0 = current tax expense / pre-tax income = TXC/PI. Results < 0 set equal to zero. Results > 1 set equal to 1. For firms with PI < 0 Book ETR is multiplied by -1. If TXC is equal to missing and TXDI = TXT then TXC = 0. If TXC is equal to missing and TXT and TXDI are not equal to missing than TXC = TXT – TXDI.
Deferred ETR	Contribution of worldwide taxation to ETR difference	If pre-tax income (PI) >= 0 = deferred tax expense / pre-tax income = TXDI/PI. Results < 0 set equal to zero. Results > 1 set equal to 1. For firms with PI < 0 Book ETR is multiplied by -1. If TXDI is equal to missing and TXC = TXT then TXDI = 0. If TXDI is equal to missing and TXT and TXC are not equal to missing than TXC = TXT – TXC.
Industry	Line of business	2-digit Standard Industry Classification (“SIC”) code as reported by COMPUSTAT
Inversion Firm	Non-U.S. Firm that has undergone inversion or redomiciliation	Indicator variable = 1 if Non-U.S. Firm appears on at least one of the lists of inversion firms published by Mider & Drucker (2016) or Marples & Gravelle (2014). “Other Non-U.S. Firms” have indicator variable = 0.
Leverage	Opportunity for inter-affiliate interest deductions	Total liabilities (DLTT)/Total Assets (AT)
Log of Sales	Firm size	Log of total sales = log SALE
Loss Firm Year	Year in which firm had negative profit	Indicator variable = 1 if Pre-tax income (PI) < 0
Material U.S. Presence	Material U.S. operations	One or both of (i) LOC = USA or (ii) one or more of US (or if necessary North American) sales (SALES), PP&E (PPENTS) or employment (EMPS) segments > 25% total

¹⁹ Abbreviations in ALLCAPS refer to data field names in COMPUSTAT. Except for tax outcome variables, all continuous variables are winsorized at the 1% and 99% levels and all variables are measured at time t for main testing. Tax outcome variables are censored so that they fit the interval [0,1] for Profit Firm Years and the interval [-1,0] for Loss Firm Years. For Profit Firm Years, the effective tax rates for each of the three tax outcomes are censored at 1 for approximately 2% of the observations and at 0 for approximately 7% of the observations. For Loss Firm Years, the tax outcome of Book ETR is censored at -1 for 2.2% of the observations and at 0 for 47% of the observations. We use a Tobit regression to provide a robustness check of our censoring approach for the tax variables and find that the regression results used to test our hypotheses are substantially the same.

		in > 25% of years the firm appears in the sample
NOL Present	Tax losses	Indicator variable equal to 1 if TLCF > 0, 0 otherwise.
Non-Canada, Non-Tax Haven Firm		Non-U.S. Firm neither Canada Firm nor Tax Haven Firm
Non-U.S. Firm	Decentered multinational firm with corporate group parent incorporated outside U.S. and material U.S. operations	Requires (i) COMPUSTAT item FIC ≠ USA, with re-code for U.S. incorporation for specific firm years if firm parent reports U.S. incorporation and Non-U.S. Incorporation in different years, per SEC EDGAR database and (ii) Material U.S. Presence.
Other Non-U.S. Firm		Non-U.S. Firm not Inversion Firm
Percentage of Non-U.S. Sales	Magnitude of foreign operations	Total geographic Sales (SALES) listed in COMPUSTAT segment reporting other than under segment names starting with “United States;” or if no such segment “North America” or “Americas” if such segment names do not list a geographic segment not within North or South America.
Percentage of Non-U.S. Sales	Relative intensity of non-U.S. operations	Non-US Segment Sales / total sales = Non-U.S. Segment Sales / Total Segment Sales (SALES)
Permanent Reinvested foreign earnings (PRE)		Indefinitely Reinvested foreign earnings (FOREIGN_EARNINGS) from the Audit Analytics Tax Footnote Database divided by \$1,000,000. If FOREIGN_EARNINGS equals missing then FOREIGN_EARNINGS is set equal to zero.
Pre-Tax Return on Sale	Pre-tax profitability	Pre-tax income / Total Sales = PI / SALE
Profit Firm Year	Year in which firm had positive profit	Indicator variable = 1 if Pre-tax income (PI) >= 0
R&D Expense	Value of patent/other intellectual property	R&D expense / total sales = XRD/SALE If XRD is missing, then XRD = 0
Tax Haven Firm		Non-U.S. Firm with FIC = country listed in Dharmapala & Hines (2009)
Three-Year Long-Run Cash ETR _t	Tax planning efficiency	(Sum of taxes paid from t+1 to t+3)/(sum of pre-tax income from t+1 to t+3) = $\frac{\sum_{t=1}^3 \text{TXPD}_t}{\sum_{t=1}^3 \text{PI}_t}$. If the denominator is less than zero, the observation is eliminated. Results < 0 set = 0. Results > 1 set = 1.
U.S. Firm	Multinational firm with material U.S. operations, not a Non-U.S. Firm	Firm in total sample not coded as a Non-U.S. Firm

Table 2: Sample Construction

<i>Panel A: Total Sample</i>	Firm years	Unique Firms
Firms with fiscal year start on/after 1/1/99 and end on/before 12/31/14	182,161	23,791
Less firms with total assets under \$10 million	(51,358)	(6,058)
Less firms missing total sales (SALE), sales < \$10 million	(18,079)	(2,438)
Less firms with missing total liabilities	(288)	(13)
Less fund firms with SIC 6000-6199, 6722, 6726, 6798, 6799	(15,713)	(2,180)
Less firms with missing Non-U.S. Segment Sales (defined in Table 1)	(52,330)	(7,130)
Less Firms missing data necessary to construct Book ETR _t	(11)	-
Less firms without Material U.S. Presence (defined in Table 1)	(7,491)	(1,089)
<i>Total Sample</i>	36,891	4,883
<i>Panel B: Non-U.S. Firms</i>		
Require firm year or firm to have code “Non-U.S. Firm” (defined in Table 1)	(31,026)	(4,200)
<i>Total Non-U.S. Firms</i> ²⁰	5,865	683
<i>Panel C: Inversion Firms</i>		
Inversion Firms (defined in Table 1)		105
Less firms with Insufficient information to be included in the full sample		(57)
<i>Total Inversion Firms</i>	377	48

²⁰ Of the 683 firms in the Non-U.S. Firms group, 87 of the 683 unique firms were coded as such because the Compustat headquarters location (LOC) was not equal to U.S. The remaining 596 were identified through the geographic segment screen that requires at least one of U.S. SALES, PPENTS, or EMPS to exceed 25% of the firm total in more than 25% of the years the firm appears in the sample. Of the 5,865 firm years in the Non-U.S. Firms group, 637 were coded as such because the Compustat headquarters location (LOC) was not equal to U.S. The remaining 5,228 firm years and 596 unique firms were identified through the geographic segment screen that requires at least one of U.S. SALES, PPENTS, or EMPS to exceed 25% of the firm total in more than 25% of the years the firm appears in the sample.

Table 3: Incorporation Location

Firm group by incorporation location of parent corporation	Firms in Total Sample	Percent of Total Sample	Inversion Firms	Inversion Firms as Percent of Total Sample
<i>U.S. Firms</i>	4,200	86.01%	-	0%
<i>Canada Firms</i>	201	4.12%	2	1%
<i>Non-Canada, Non-Tax Haven Firms</i>				
Australia	12	0.25%	1	8%
France	24	0.49%	-	0%
Germany	17	0.35%	-	0%
Israel	78	1.60%	1	1%
Japan	14	0.29%	-	0%
Netherlands	39	0.80%	4	10%
United Kingdom	73	1.49%	5	7%
Other	59	1.21%	-	0%
<i>Total Non-Canada, Non-Tax Haven Firms</i>	316	6.47%	11	3%
<i>Tax Haven Firms</i>				
Bahamas	2	0.04%	-	0%
Bermuda	40	0.82%	10	25%
British Virgin Islands	11	0.23%	1	9%
Cayman Islands	24	0.49%	2	8%
Guernsey - Channel Islands	1	0.02%	-	0%
Hong Kong	2	0.04%	-	0%
Ireland	32	0.66%	15	47%
Jersey - Channel Islands	9	0.18%	1	11%
Liberia	2	0.04%	-	0%
Luxembourg	10	0.20%	1	10%
Marshall Islands	1	0.02%	-	0%
Netherlands Antilles	1	0.02%	-	0%
Panama	4	0.08%	1	25%
Singapore	8	0.16%	1	13%
Switzerland	19	0.39%	3	16%
<i>Total Tax Haven Firms</i>	166	3.40%	35	21%
Total Sample	4,883	100%	48	1.0%

See Table 1 for variable definitions and Table 2 for sample construction.

Table 4: Total Sample Breakdown by 2-digit SIC Code:

2-Digit SIC	Total	Non-U.S. Firms	Non-U.S. Firms as Percent of Total Sample	Inversion Firms	Inversion Firms as Percent of Total Sample	Industry Name
73	978	127	12.99%	2	0.20%	Business Services
28	422	80	18.96%	10	2.37%	Chemical & Allied Products
36	542	73	13.47%	7	1.29%	Electronic & Other Electric Equipment
38	405	46	11.36%	2	0.49%	Instruments & Related Products
35	401	40	9.98%	4	1.00%	Industrial Machinery & Equipment
13	119	27	22.69%	9	7.56%	Oil & Gas Extraction
37	129	21	16.28%	2	1.55%	Transportation Equipment
48	127	20	15.75%	1	0.79%	Communications
63	46	18	39.13%	1	2.17%	Insurance Carriers
33	83	15	18.07%	-		Primary Metal Industries
10	25	14	56.00%	-		Metal, Mining
20	101	14	13.86%	-		Food & Kindred Products
26	59	12	20.34%	-		Paper & Allied Products
39	70	12	17.14%	-		Miscellaneous Manufacturing Industries
49	78	12	15.38%	-		Electric, Gas, & Sanitary Services
87	98	12	12.24%	1	1.02%	Engineering & Management Services
50	110	9	8.18%	-		Wholesale Trade - Durable Goods
27	52	8	15.38%	-		Printing & Publishing
32	32	8	25.00%	-		Stone, Clay, & Glass Products
65	28	8	28.57%	-		Real Estate
23	48	6	12.50%	1	2.08%	Apparel & Other Textile Products
29	25	6	24.00%	-		Petroleum & Coal Products
44	18	6	33.33%	-		Water Transportation
62	74	6	8.11%	1	1.35%	Security & Commodity Brokers
30	71	5	7.04%	-		Rubber & Miscellaneous Plastics Products
34	79	5	6.33%	2	2.53%	Fabricated Metal Products
51	58	5	8.62%	1	1.72%	Wholesale Trade - Nondurable Goods
70	14	5	35.71%	-		Hotels & Other Lodging Places
25	25	4	16.00%	-		Furniture & Fixtures
58	25	4	16.00%	1	4.00%	Eating & Drinking Places
59	60	4	6.67%	-		Miscellaneous Retail
78	34	4	11.76%	-		Motion Pictures
80	30	4	13.33%	-		Health Services
Other	417	43	10.31%	3	0.72%	Various*
Total	4883	683	13.99%	48	0.98%	

Table 1 defines variables. See Table 2 for sample construction.

* Includes all SIC codes with three or fewer non-U.S. incorporated firms.

Table 5: Comparison of Mean Values between U.S. Firms and Non-U.S. Firms

Panel A: Profit firm years

Variable Name	Incorporation Location	
	U.S	Non-U.S.
Log of Sales _t	6.71 (1.84)	7.39*** (2.09)
Percentage of Non-U.S. Sales _t	0.36 (0.26)	0.55*** (0.22)
Pre-Tax Return on Sales _t	0.11 (0.1)	0.14*** (0.12)
Leverage _t	0.17 (0.19)	0.16*** (0.15)
R&D Expense _t	0.05 (0.07)	0.05 (0.08)
Advertising Expense _t	0.01 (0.03)	0.01*** (0.02)
NOL Present _t	0.46 (0.5)	0.43*** (0.5)
Book ETR _t	0.31 (0.18)	0.25*** (0.2)
Cash ETR _t	0.27 (0.23)	0.24*** (0.23)
Three-year Long Run Cash ETR	0.30 (0.21)	0.26*** (0.21)
Number of Observations for Book ETR _t	21,037	4,238
Number of Observations for Cash ETR _t	20,472	3,260
Number of Observations for Three-year Long Run Cash ETR	11,831	1,792

***, **, * - Difference in means is significant at the 1%, 5%, 10% level. Standard errors in parentheses.

Panel B – Loss firm years

Variable Name	Incorporation Location	
	U.S	Non-U.S.
Log of Sales _t	5.24 (1.77)	5.46*** (2.19)
Percentage of Non-U.S. Sales _t	0.37 (0.27)	0.53*** (0.25)
Pre-Tax Return on Sales _t	-0.32 (0.52)	-0.36** (0.55)
Leverage _t	0.20 (0.26)	0.18** (0.23)
R&D Expense _t	0.15 (0.22)	0.17*** (0.26)
Advertising Expense _t	0.01 (0.03)	0.01* (0.03)
NOL Present _t	0.55 (0.5)	0.51** (0.5)
Book ETR _t	-0.11 (0.21)	-0.09** (0.22)
Number of Observations	9,989	1,627

***, **, * - Difference in means is significant at the 1%, 5%, 10% level
Standard errors in parentheses.

Table 6: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Non-US Incorporation	1											
(2) Log of Sales _t	0.11*	1										
(3) Percentage of Non-US Sales _t	0.25*	0.04*	1									
(4) Pre-Tax Return on Sales _t	0.02*	0.33*	0.01	1								
(5) Leverage _t	-0.03*	0.23*	-0.08*	-0.01*	1							
(6) R&D _t	0.01	-0.38*	0.11*	-0.58*	-0.17*	1						
(7) Advertising Expense _t	-0.04*	0.02*	-0.07*	-0.05*	0.03*	-0.01*	1					
(8) NOL Present at Time t	-0.03*	0.00	0.05*	-0.06*	0.04*	0.06*	0.00	1				
(9) Book ETR _t , Profit Firm Years	-0.02*	0.23*	-0.04*	0.30*	-0.02*	-0.19*	0.01	-0.06*	1			
(10) Book ETR _t , Loss Firm Years	0.03*	-0.22*	0.07*	-0.20*	-0.05*	0.19*	0.04*	0.05*	.	1		
(11) Cash ETR _t	-0.02*	0.19*	-0.00	0.24*	-0.01*	-0.18*	0.01*	-0.05*	0.59*	.	1	
(12) Three Year Long Run ETR	-0.06*	-0.01	-0.01	-0.07*	-0.01	-0.09*	0.02*	-0.01	0.22*	.	0.27*	1

*= significant at least at the 5% level. Table 1 defines variables. See Table 2 for sample construction.

Table 7: Main Results: Test of Hypotheses 1 and 2. OLS regression of effective tax rate measures for Non-U.S. Firms compared to U.S. Firms

<i>Independent Variable</i>	<i>Dependent Variable</i>			
	ETR_t	CETR_t	Long-Run Cash ETR	Loss ETR_t
Intercept	0.24*** (0.051)	0.24*** (0.065)	0.26*** (0.075)	0.02 (0.027)
Non-U.S. Incorporation	-0.05*** (0.006)	-0.03*** (0.007)	-0.03*** (0.010)	0.02*** (0.006)
Log of Sales_t	0.01*** (0.001)	0.01*** (0.001)	-0.00 (0.002)	-0.02*** (0.002)
Percentage of Non-U.S. Sales_t	-0.03*** -0.007	0.05*** -0.01	0.03** -0.013	0.05*** -0.009
Pre-Tax Return on Sales_t	-0.20*** (0.018)	-0.55*** (0.025)	-0.15*** (0.028)	-0.05*** (0.004)
Other Controls	yes	yes	yes	yes
Industry Controls	yes	yes	yes	yes
Year Controls	yes	yes	yes	yes
N	25,275	23,732	13,623	11,616
Adjusted R squared	0.08	0.09	0.06	0.10

Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Errors are clustered by firm. Variables defined in Table 1. See Table 2 for sample construction

This table presents the results from the following OLS regression:

$$\text{ETR Measure} = \beta_0 + \beta_1 (\text{Non-U.S. Incorporation})_{it} + \beta_2 (\text{Log of Sales})_{it} + \beta_3 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_4 (\text{Pre-Tax Return on Sales})_{it} + \beta_5 (\text{R\&D Expense})_{it} + \beta_6 (\text{Advertising Expense})_{it} + \beta_7 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

Table 8: Comparison of Mean Values: Other Non-U.S. Firms and Inversion Firms and Geographic Subgroups of Non-U.S. Firms

Panel A: Profit Firm Years

Variable Name	Comparison of Other Non-U.S. Firms and Inversion Firms		Comparison of U.S. Firms to Geographic Subgroups of Non-U.S. Firms				
	Other Non-US Firms	Inversion Firms	U.S	Canada	Non-Canada Non-Tax Haven	Tax Haven	
Log of Sales _t	7.34 (2.12)	8.17*** (1.31)	6.71 (1.84)	6.82 (1.83)	7.6*** (2.23)	7.55*** (1.93)	
Percentage of Non-U.S. Sales _t	0.55 (0.22)	0.54 (0.22)	0.36 (0.26)	0.48*** (0.23)	0.6*** (0.2)	0.53*** (0.23)	
Pre-Tax Return on Sales _t	0.14 (0.12)	0.13 (0.11)	0.11 (0.1)	0.13*** (0.12)	0.14*** (0.12)	0.14*** (0.12)	
Leverage _t	0.16 (0.15)	0.22*** (0.17)	0.17 (0.19)	0.19*** (0.16)	0.15*** (0.14)	0.15*** (0.16)	
R&D Expense _t	0.05 (0.08)	0.02*** (0.08)	0.05 (0.07)	0.03*** (0.07)	0.06*** (0.08)	0.04 (0.08)	
Advertising Expense _t	0.01 (0.02)	0.01* (0.03)	0.01 (0.03)	0.00*** (0.01)	0.01 (0.03)	0.01** (0.02)	
NOL Present _t	0.42 (0.49)	0.63*** (0.48)	0.46 (0.5)	0.45 (0.5)	0.41*** (0.49)	0.46 (0.5)	
Book ETR _t	0.25 (0.2)	0.25 (0.21)	0.31 (0.18)	0.28*** (0.21)	0.26*** (0.19)	0.22*** (0.2)	
Cash ETR _t	0.24 (0.23)	0.24 (0.22)	0.27 (0.23)	0.24*** (0.25)	0.25** (0.23)	0.21*** (0.22)	
Three-year Long-Run Cash ETR	0.26 (0.22)	0.25 (0.19)	0.3 (0.21)	0.27** (0.23)	0.27*** (0.2)	0.24*** (0.21)	
Number of Observations for Book ETR	3,944	294	21,037	1,061	2,123	1054	
Number of Observations for Cash ETR	2,967	293	20,472	977	1,396	887	

Number of Observations for Three-Year Long Run Cash ETR	1,625	167		11,831	557	746	489
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Panel B: Loss Firm Years

Variable Name	Comparison of Non-U.S. Incorporated Firms to Inversion Firms		Comparison of Subgroups of Non-U.S. Incorporated Firms to U.S. Incorporated Firms			
	Other Non-US Incorporated	Inversion Firms	U.S	Canada	Non-Canadian Non-Tax Haven	Tax Haven
Log of Sales _t	5.35 (2.16)	7.52*** (1.76)	5.24 (1.77)	5.38 (2.01)	5.15 (2.26)	6.24*** (2.11)
Percentage of Non-U.S. Sales _t	0.53 (0.25)	0.56 (0.23)	0.37 (0.27)	0.47*** (0.24)	0.57*** (0.24)	0.53*** (0.26)
Pre-Tax Return on Sales _t	-0.37 (0.55)	-0.27 (0.45)	-0.32 (0.52)	-0.40** (0.59)	-0.34 (0.49)	-0.37 (0.61)
Leverage _t	0.17 (0.22)	0.39*** (0.29)	0.2 (0.26)	0.19 (0.22)	0.15*** (0.2)	0.23* (0.27)
R&D Expense _t	0.17 (0.26)	0.13 (0.29)	0.15 (0.22)	0.14 (0.25)	0.2*** (0.26)	0.14 (0.25)
Advertising Expense _t	0.01 (0.03)	0.01 (0.02)	0.01 (0.03)	0.01* (0.03)	0.01 (0.03)	0.01 (0.03)
NOL Present _t	0.5 (0.5)	0.76*** (0.43)	0.55 (0.5)	0.54 (0.5)	0.49*** (0.5)	0.52 (0.5)
Book ETR _t	-0.09 (0.22)	-0.10 (0.21)	-0.11 (0.21)	-0.14** (0.25)	-0.07*** (0.19)	-0.08* (0.21)
Number of Observations*	1,544	83	9,989	515	758	354

***, ** and * - difference in means is statistically significant at the 1%, 5%, and 10% level. Standard errors in parentheses. See Table 1 for Variable descriptions, and table 2 for sample construction.

Table 9: OLS Regression of Effective Tax Rate Measures on Non-U.S. Firm and Inversion Firm Status

<i>Independent Variable</i>	<i>Dependent Variable</i>			
	Profit Firm Years			Loss Firm Years
	Book ETR_t	Cash ETR_t	Three-Year Long-Run Cash ETR	Book ETR_t
Intercept	0.24*** (0.052)	0.24*** (0.065)	0.26*** (0.076)	0.02 (0.027)
Non-U.S. Firm	-0.05*** (0.006)	-0.03*** (0.007)	-0.03*** (0.010)	0.01** (0.006)
Inversion Firm X Non-U.S. Firm	-0.02 (0.019)	-0.02 (0.018)	-0.03 (0.024)	0.05 (0.033)
Log of Sales_t	0.01*** (0.001)	0.01*** (0.001)	-0.00 (0.002)	-0.02*** (0.002)
Percentage of Non-U.S. Sales_t	-0.03*** (0.007)	0.05*** (0.010)	0.03** (0.013)	0.05*** (0.008)
Pre-Tax Return on Sales_t	-0.20*** (0.018)	-0.55*** (0.025)	-0.15*** (0.028)	-0.05*** (0.004)
Other Controls	yes	yes	Yes	yes
Industry Controls	yes	yes	Yes	yes
Year Controls	yes	yes	Yes	yes
Number of Observations	25,275	23,732	13,623	11,616
Adjusted R squared	0.08	0.09	0.06	0.10

Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Errors are clustered by firm. Variables defined in Table 1. See Table 2 for sample construction.

This table presents the results from the following OLS regression:

$$\text{ETR Measure} = \beta_0 + \beta_1 (\text{Non-U.S. Incorporation})_{it} + \beta_2 (\text{Inversion Firm})_{it} \times (\text{Non-U.S. Incorporation})_{it} + \beta_3 (\text{Log of Sales})_{it} + \beta_4 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_5 (\text{Pre-Tax Return on Sales})_{it} + \beta_6 (\text{R\&D Expense})_{it} + \beta_7 (\text{Advertising Expense})_{it} + \beta_8 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

Table 10: OLS Regression on Geographic Subgroup of Non-U.S. Firm

<i>Independent Variable</i>	<i>Dependent Variable</i>			
	Book ETR_t	Cash ETR_t	Three-Year Long Run Cash ETR_t	Loss Firm years BookETR_t
Intercept	0.24*** (0.049)	0.25*** (0.063)	0.27*** (0.074)	0.02 (0.026)
Canada Firm	-0.03*** (0.011)	-0.03** (0.012)	-0.03 (0.017)	-0.02* (0.012)
Non-Canada, Non-Tax Haven Firm	-0.05*** (0.008)	-0.02 (0.010)	-0.02 (0.015)	0.03*** (0.008)
Tax Haven Firm	-0.08*** (0.010)	-0.05*** (0.012)	-0.05*** (0.016)	0.05*** (0.012)
Log of Sales_t	0.01*** (0.001)	0.01*** (0.001)	-0.00 (0.002)	-0.02*** (0.002)
Percentage of Non-U.S. Sales_t	-0.03*** (0.007)	0.05*** (0.010)	0.03** (0.013)	0.04*** (0.008)
Pre-Tax Return on Sales_t	-0.20*** (0.018)	-0.55*** (0.025)	-0.15*** (0.028)	-0.05*** (0.004)
Other Controls	yes	yes	yes	yes
Industry Controls	yes	yes	yes	yes
Year Controls	yes	yes	yes	yes
N	25,275	23,732	13,623	11,616
Adjusted R squared	0.08	0.09	0.06	0.11
F statistic from Test of Equality of Coefficients				
Canada = Non-Canada, Non-Tax Haven	1.00	0.75	0.07	12.39***
Canada = Tax Haven	9.72***	2.67*	1.16	17.32***
Non-Canada, Non-Tax Haven = Tax Haven	7.10***	6.70***	2.12	1.89

Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Errors are clustered by firm. Variables defined in Table 1. See Table 2 for sample construction.

This table presents the results from the following OLS regression:

$$\text{ETR Measure} = \beta_0 + \beta_1 (\text{Canada})_{it} + \beta_2 (\text{Non-Canada, Non-Tax Haven})_{it} + \beta_3 (\text{Tax Haven})_{it} + \beta_4 (\text{Log of Sales})_{it} + \beta_5 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_6 (\text{Pre-Tax Return on Sales})_{it} + \beta_7 (\text{R\&D Expense})_{it} + \beta_8 (\text{Advertising Expense})_{it} + \beta_9 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

Table 11: Profit Firm Years: Mechanism for Lower ETRs for Non-U.S. Firms

Panel A: Comparison of Mean Book, Current, and Deferred ETR

Variable Name	Comparison of Subgroups of Non-U.S. Incorporated Firms to U.S. Incorporated Firms					
	U.S. Firm	Non-U.S. firm	Canada Firm	Non-Canadian Non-Tax Haven Firm	Tax Haven Firm	
Book ETR _t	0.31 (0.18)	0.26*** (0.20)	0.28*** (0.21)	0.26*** (0.19)	0.23*** (0.2)	
Current ETR _t	0.30 (0.22)	0.26*** (0.22)	0.27*** (0.24)	0.27*** (0.21)	0.24*** (0.22)	
Deferred ETR _t	0.08 (0.16)	0.06*** (0.14)	0.09* (0.16)	0.05*** (0.13)	0.04*** (0.11)	
Number of Observations	20,675	3,921	1,007	1,905	1,009	

Panel B – OLS Regression of Book, Current, and Deferred ETR

Dependent variable	(1) All Non-U.S.			(2) Geographic Subgroups				
	Non-US	N	R2	Canada	Non-Canadian Non-Tax Haven	Tax Haven	N	R2
Book ETR _t	-0.05*** (0.006)	24,596	0.08	-0.03*** (0.011)	-0.04*** (0.008)	-0.07*** (0.010)	24,596	0.08
Current ETR _t	-0.04*** (0.007)	24,596	0.08	-0.03** (0.012)	-0.04*** (0.009)	-0.06*** (0.012)	24,596	0.08
Deferred ETR _t	-0.01*** (0.003)	24,596	0.08	0.00 (0.007)	-0.01*** (0.004)	-0.02*** (0.005)	24,596	0.08

Panel C – Comparison of Mean Book, Current, and Deferred ETR for Firms in PRE Subsample

Variable Name	Comparison of Subgroups of Non-U.S. Incorporated Firms to U.S. Incorporated Firms					
	U.S.	Non-U.S firm	Canada	Non-Canadian Non-Tax Haven	Tax Haven	
Book ETR _t	0.30 (0.18)	0.23*** (0.21)	0.28 (0.21)	0.24** (0.21)	0.21*** (0.21)	
Current ETR _t	0.29 (0.22)	0.25*** (0.23)	0.29 (0.23)	0.25 (0.24)	0.24*** (0.23)	
Deferred ETR _t	0.07 (0.15)	0.05*** (0.12)	0.08 (0.17)	0.04 (0.1)	0.04*** (0.12)	
Percentage of Firms with PRE	0.64					
PRE/Ending Total Assets	0.09 (0.13)					
Number of Observations	9,018	439	85	90	264	

Panel D – OLS Regressions of Book, Current, and Deferred ETR for Firms in PRE Subsample

Dependent variable	(1) All Non-U.S.			(2) Geographic Subgroups				
	Non-US	N	R2	Canada	Non-Canadian Non-Tax Haven	Tax Haven	N	R2
Book ETR _t	-0.05*** (0.013)	9,457	0.08	-0.02 (0.027)	-0.06* (0.034)	-0.07*** (0.016)	9,457	0.08
Current ETR _t	-0.03** (0.014)	9,457	0.09	0.01 (0.027)	-0.03 (0.040)	-0.04*** (0.017)	9,457	0.09
Deferred ETR _t	-0.02*** (0.008)	9,457	0.09	0.01 (0.022)	-0.03* (0.016)	-0.03*** (0.009)	9,457	0.09

Panel E - OLS Regressions of Book, Current and Deferred ETR for Firms in PRE Subsample Without U.S. Firms That Do Not Record PRE.

Dependent variable	(1) All Non-U.S.			(2) Geographic Subgroups				
	Non-US	N	R2	Canada	Non-Canadian Non-Tax Haven	Tax Haven	N	R2
Book ETR _t	-0.08*** (0.016)	3,698	0.08	-0.04 (0.028)	-0.08** (0.039)	-0.09*** (0.017)	3,698	0.08
Current ETR _t	-0.04** (0.018)	3,698	0.10	-0.00 (0.030)	-0.05 (0.048)	-0.06*** (0.019)	3,698	0.10
Deferred ETR _t	-0.04*** (0.010)	3,698	0.08	-0.02 (0.023)	-0.05** (0.019)	-0.04*** (0.011)	3,698	0.08

Panel F – OLS Regressions of Book, Current, and Deferred ETR for Firms in PRE Subsample Without U.S. Firms That Record PRE

Dependent variable	(1) All Non-U.S.			(2) Geographic Subgroups				
	Non-US	N	R2	Canada	Non-Canadian Non-Tax Haven	Tax Haven	N	R2
Book ETR _t	-0.04*** (0.013)	6,198	0.10	-0.02 (0.027)	-0.04 (0.031)	-0.06*** (0.016)	6,198	0.10
Current ETR _t	-0.03* (0.015)	6,198	0.11	-0.00 (0.027)	-0.03 (0.039)	-0.04** (0.017)	6,198	0.11
Deferred ETR _t	-0.01 (0.008)	6,198	0.09	0.02 (0.022)	-0.02 (0.016)	-0.02** (0.008)	6,198	0.09

Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Errors are clustered by firm. Variables defined in Table 1. See Table 2 for sample construction.

Panels A & B start with the main sample and remove all firms missing information to calculate the desired ETR measured.

Panels C-E include all profit firm years that can be identified in Audit Analytics tax footnote database, and have sufficient information to calculate the required ETR measures.

Panels B, D, E and F report the regression coefficients on incorporation location from the following OLS Regressions:

$$(1) \text{ ETR Measure} = \beta_0 + \beta_1 (\text{Non-U.S. Incorporation})_{it} + \beta_2 (\text{Log of Sales})_{it} + \beta_3 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_4 (\text{Pre-Tax Return on Sales})_{it} + \beta_5 (\text{R\&D Expense})_{it} + \beta_6 (\text{Advertising Expense})_{it} + \beta_7 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

$$(2) \text{ ETR Measure} = \beta_0 + \beta_1 (\text{Canada})_{it} + \beta_2 (\text{Non-Canada, Non-Tax Haven})_{it} + \beta_3 (\text{Tax Haven})_{it} + \beta_4 (\text{Log of Sales})_{it} + \beta_5 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_6 (\text{Pre-Tax Return on Sales})_{it} + \beta_7 (\text{R\&D Expense})_{it} + \beta_8 (\text{Advertising Expense})_{it} + \beta_9 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

Table 12: Loss Firm Years: Mechanisms for Different ETR Results for Non-U.S. Firms

Panel A: Percentage of Loss Firm Years with a Positive, Zero, or Negative Book ETR

Percentage of Loss Firms year with:	Comparison of Subgroups of Non-U.S. Incorporated Firms to U.S. Incorporated Firms				
	U.S	Non-U.S firm	Canada	Non-Canadian Non-Tax Haven	Tax Haven
Positive Book ETR _t	0.46	0.51***	0.43	0.52**	0.60***
Zero Book ETR _t	0.13	0.13	0.10*	0.17**	0.07***
Negative Book ETR _t	0.40	0.37**	0.46**	0.31***	0.33**

***,**, * significantly difference from the U.S. at the 1%, 5%, 10% level. N = 11,616.

Panel B: Distribution of Book ETR_t

Incorporation Group	N	Mean	Standard Deviation	p10	p25	p50	p75	p90
Total Loss Firm Sample	11,616	0.17	5.57	-0.37	-0.13	0.00	0.05	0.37
U.S. Firms	9,989	0.16	5.59	-0.37	-0.14	0.00	0.05	0.36
All Non-U.S. Firms	1,627	0.22	5.45	-0.31	-0.07	0.00	0.07	0.44
Canada	515	0.15	8.82	-0.45	-0.17	0.00	0.04	0.31
Non-Canadian, Non-Tax Haven	758	0.21	2.45	-0.23	-0.03	0.00	0.06	0.42
Tax Haven	354	0.31	3.26	-0.25	-0.04	0.01	0.14	0.66

Panel C: OLS and Quantile Regressions of Book ETR_t for Loss Firm Years

	Non-U.S. Firm (1)		Canada Firm (2)		Non-Canada, Non-Tax Haven Firm (2)		Tax Haven Firm (2)	
	Coeff	Std Error	Coeff	Std Error	Coeff	Std Error	Coeff	Std Error
<i>OLS</i>	-0.00	(0.153)	0.02	(0.409)	-0.06	(0.126)	0.09	(0.188)
<i>Quantile</i>								
P10	0.04***	(0.010)	-0.01	(0.013)	0.08***	(0.015)	0.09***	(0.021)
P25	0.02***	(0.005)	-0.01	(0.011)	0.02***	(0.006)	0.05***	(0.009)
P50	0.00	(0.001)	-0.01**	(0.002)	-0.00	(0.001)	0.02***	(0.003)
P75	0.00	(0.004)	0.01	(0.007)	-0.00	(0.004)	0.04*	(0.022)
P90	-0.03	(0.024)	-0.03	(0.035)	-0.05**	(0.024)	0.06	(0.075)
N	11,616		11,616					
Average Psuedo R ²	0.03		0.03					

***,**, * significantly difference from zero at the 1%, 5%, 10% level. Standard errors in parentheses.

Panels C report the regression coefficients on incorporation location from the following OLS and Quantile regressions:

$$(1) \text{ Book ETR}_{it} = \beta_0 + \beta_1 (\text{Non-U.S. Firm})_{it} + \beta_2 (\text{Log of Sales})_{it} + \beta_3 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_4 (\text{Pre-Tax Return on Sales})_{it} + \beta_5 (\text{R\&D Expense})_{it} + \beta_6 (\text{Advertising Expense})_{it} + \beta_7 (\text{Leverage})_{it} + \text{Industry Indicators} + \text{Year Indicators} + \varepsilon_{it}$$

$$\text{Book ETR}_{it} = \beta_0 + \beta_1 (\text{Canada})_{it} + \beta_2 (\text{Non-Canada, Non-Tax Haven})_{it} + \beta_3 (\text{Tax Haven})_{it} + \beta_4 (\text{Log of Sales})_{it} + \beta_5 (\text{Percentage of Non-U.S. Sales})_{it} + \beta_6 (\text{Pre-Tax Return on Sales})_{it} + \beta_7 (\text{R\&D Expense})_{it} + \beta_8 (\text{Advertising Expense})_{it} + \beta_9 (\text{Leverage})_{it} + \text{Industry Indicators}$$