The Asymmetric Tax Consequences of Foreign Tax Haven Use

Hunter Aku
University of Texas at San Antonio
hunter.aku@utsa.edu

Robert Hills
University of Georgia
roberthills@uga.edu

*Christina M. Lewellen
North Carolina State University
cmlewell@ncsu.edu

Bradley P. Lindsey
Utah State University
brad.lindsey@usu.edu

August 2025

Keywords: loss firms, tax avoidance, tax havens, tax avoidance

Data Availability: Data used in this study are available from public sources identified in the paper.

Keywords: loss firms, tax avoidance, tax havens, international tax planning
JEL Codes: H25, H26, H32, F23

Acknowledgments: We are grateful for financial support from our respective institutions. We appreciate helpful comments from Scott Dyreng, Nathan Goldman, Kathy Zuravel, and Andy Duxbury.

*Corresponding author: Phone: 919.515.4440. Email: cmlewell@ncsu.edu. Poole College of Management, Raleigh, North Carolina 27695 USA

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Abstract

We investigate whether U.S. multinational firms with foreign tax haven operations experience diminished tax benefits from losses. While tax haven structures are known to lower tax burdens in profitable years, we show that foreign tax haven use also reduces tax benefits when losses occur. The effect is most salient for generally profitable firms with infrequent losses. Additional analyses show the effect is concentrated in firms with "Big Haven" operations, which are more likely to reflect real operations relative to dot havens, and in mobile-income industries, where firms have greater flexibility to shift profits. Our findings highlight an overlooked cost of tax planning: the same structures that reduce taxes when firms are profitable can diminish the benefits of losses. This trade-off helps explain why firms may not pursue more aggressive tax avoidance strategies and informs research on the tax consequences of losses.

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I. INTRODUCTION

U.S. multinational firms ("MNC") commonly employ tax planning strategies aimed at reducing their tax burdens. Embedded within a U.S. MNC's arsenal of potential tax planning opportunities is the variation in corporate income tax rates among the different jurisdictions where the firm operates (Fox et al. 2022). Many U.S. MNCs expend considerable effort and nontrivial resources to exploit this variation by shifting profits from relatively higher-tax jurisdictions to relatively lower-tax jurisdictions, often facilitated by establishing one or more foreign tax havens (Altshuler and Grubert 2003; Desai et al. 2006; Murphy 2023; Dyreng et al. 2024). While these foreign tax haven activities aim to maximize after-tax profits when a firm is doing well, they may inadvertently create a significant drawback: diminished tax benefits from losses.

Ideally, firms would prefer to maximize tax loss benefits from loss years, including realizing losses in high-tax jurisdictions, to maximize their tax savings. However, when a U.S. MNC incurs losses, the tax haven strategies designed for tax avoidance during profitable times can make it harder to recover the full tax benefits from those losses and can, in some cases, result in *paying tax* despite an overall loss. This dilemma represents a potentially overlooked cost of multijurisdictional tax planning. In this paper, we investigate whether and to what extent this dilemma occurs. Specifically, we examine the extent to which U.S. MNCs that use foreign tax havens experience diminished tax benefits from losses.

Our research question addresses a gap in the corporate tax avoidance literature. While prior studies focus extensively on how firms avoid taxes, primarily focusing on the benefits realized during profitable years, there is a notable lack of understanding in the literature regarding the potential costs of tax planning, particularly when firms incur losses, and how these costs may

influence tax planning outcomes.[1] For example, researchers have documented substantial variation in effective tax rates across firms (see Shackelford and Shevlin 2001; Hanlon and Heitzman 2010; Wilde and Wilson 2018). While some firms consistently pay low taxes, others pay taxes at rates at or exceeding the statutory rate (Dyreng et al. 2008). Yet, establishing exactly why some firms opt not to engage in more tax planning when the documented risks of tax avoidance remain relatively low has remained a puzzle. While some explanations for this puzzle include reputational concerns (e.g., Gallemore et al. 2014; DePaul et al. 2025), foreign currency exchange risk (e.g., Deng 2020), and agency problems (e.g, Desai and Dharmapala 2006; Hanlon and Slemrod 2009; Hanlon et al. 2015), one underappreciated cost of tax avoidance may be the diminished tax benefits of losses. For U.S. MNCs with complex global tax structures, including foreign tax havens, such strategies could result in losses being costlier than if no foreign tax havens were used.

To estimate the tax benefit associated with losses, we use the research design in Dyreng and Lindsey (2009), which allows us to directly model total tax expense as a function of pretax income, even when income is negative. This methodology overcomes some of the pitfalls that make traditional effective tax rates difficult to interpret when firms are unprofitable, allowing us to analyze tax planning outcomes across both profit and loss years.[2] To examine how tax planning that includes foreign tax haven operations affects tax outcomes, we interact pretax income with an indicator variable for whether an MNC reports foreign tax haven operations. This interaction allows us to estimate whether firms with tax haven operations accrue different tax benefits (or burdens) for each dollar of pretax income or loss. Consistent with prior research, we find that for

[1] One notable exception is Hopland et al. (2018), where the researchers show that a sample of Norwegian MNCs are able to adapt income shifting strategies ex post, that is, after financial outcomes are known, allowing these firms to take advantage of losses incurred by affiliates. We differ in that we focus on aggregate losses.

[2] For example, effective tax rates with a positive numerator and a negative denominator are indistinguishable from effective tax rates with a negative numerator and a positive denominator, but the two capture very different tax outcomes.

a sample of firms between 1995 and 2024, foreign tax haven use is associated with lower total tax expense in profitable years. A central motivation of our investigation is the structural asymmetry in the tax treatment of profits and losses. While we find that the relationship between pretax income and total tax expense is strong and positive in profit years, it nearly disappears in loss years. In particular, we find that for firm-years with current pretax book losses, the total tax benefits of losses are very small, suggesting that firms generally do not receive meaningful tax relief when reporting losses. This pronounced asymmetry motivates our decision to focus the remainder of the analysis on understanding variation in tax outcomes among loss firm-years, and how that variation is shaped by foreign tax haven use.

Recent research has investigated loss firms in various settings, resulting in a greater understanding of whether and how loss firm-years should be included in empirical research (Henry and Sansing 2018; Drake et al. 2020; Christensen et al. 2022; Dyreng et al. 2025, etc.). We augment this valuable research stream by exploring how losses affect the tax benefits firms realize. Specifically, we analyze how the frequency of past losses and the magnitude of current losses relative to prior profitability affect the tax benefits from losses for U.S MNCs with foreign tax haven operations.

Our findings reveal a notable trade-off: while foreign tax haven use is associated with lower tax expenses for profitable years, it is also associated with diminished tax benefits for losses. This pattern is most pronounced for firms that are generally profitable and only infrequently incur losses, which are precisely those firms that should be best positioned to take advantage of loss-related tax provisions. For example, for firm years characterized by infrequent losses (i.e., losses occurring in fewer than 25 percent of observed years) and sufficient prior profits to offset current losses, we find that foreign tax haven use is associated with an approximately 23 percent reduction

in total tax benefits from losses, which corresponds to a $26.7 million decrease in the average tax benefit during loss years. This evidence highlights a potentially overlooked cost of tax planning: while foreign tax haven use is associated with reduced taxes during profitable years, it also reduces the tax benefits derived during loss years. We believe this is a lower-bound estimate of the potential lost tax benefits from losses associated with tax haven use, because firms that anticipate losses or are risk-averse may avoid or reduce their tax haven use proactively.

To bolster our primary findings, we conduct several additional analyses. First, in cross-sectional tests, we show that the effect of diminished tax benefits from losses is most salient for firms with operations in "Big Haven" jurisdictions, which are more likely to reflect real economic activity, compared to so-called "dot" havens used primarily for statutory tax rate arbitrage. Second, we show that the diminished tax benefits associated with tax haven use are concentrated in foreign-source income. Third, we show that the effect of diminished tax benefits from losses is concentrated in mobile income industries, where firms have greater flexibility to shift profits to low-tax jurisdictions. These additional findings reinforce the idea that the very structures that enable tax avoidance during profitable times may hinder the realization of tax benefits during loss years. Finally, we restrict our sample to firms with greater capacity to utilize current-year losses, specifically those with profits in at least two of the previous five years or with positive cumulative pretax income over the previous five years, and continue to find strong evidence of diminished tax benefits from losses for firms with infrequent losses and sufficient prior profitability.

Our study contributes to research on how tax costs may influence corporate geographic location decisions by identifying a key constraint on tax-motivated location choices for U.S MNCs: the contingent nature of tax benefits from foreign tax haven use. Prior research struggles to explain why firms do not engage in more aggressive tax avoidance despite its apparent benefits

(Hanlon and Heitzman 2010). We show that an economic risk associated with foreign tax haven use is that the tax benefits depend on sustained profitability and diminish when losses occur, thereby imposing a cost. Given that over 40 percent of *Compustat* firm-years in the past two decades report negative pretax income (Gu et al. 2023), and 52 percent of our sample firms incur losses in at least five years during our 26-year sample period, our evidence suggests that the diminished tax benefits from losses may be pervasive. These costs are likely substantial enough to influence firms' marginal tax avoidance decisions. Moreover, the asymmetric tax consequences we document undoubtedly contribute to cash flow volatility, which research suggests can meaningfully affect firm outcomes such as investment levels and efficiency (Myers 1977; Smith and Stulz 1985; Minton and Schrand 1999).

Second, we contribute to an emerging literature on losses and tax outcomes (e.g., Erickson et al. 2013; Bethmann et al. 2018; Henry and Sansing 2018; Hopland et al. 2018; Christensen et al. 2022; Schwab et al. 2023). Prior studies often treat loss firm-years as a homogenous group, despite substantial variation in firms' ability to derive tax benefits from these losses. In this study, we examine and quantify variation with the aid of two measures: (1) the proportion of firm-years with losses and (2) an indicator of whether a firm has sufficient prior profits to absorb current losses. Our results underscore that loss firms are not a monolith, and that both loss frequency and magnitude matter when evaluating the value of tax benefits and costs of tax planning. Our paper informs policymakers, regulators, and academics seeking to understand the incentives, behaviors, and tax revenue collection effects associated with corporate losses. U.S. tax law during most of our sample period allowed corporations to carry back net operating losses two years and carry them forward 20 years without a taxable income limit. Given that U.S. tax law under the Tax Cuts and Jobs Act and the One Big Beautiful Bill Act (after our sample period) continues to treat losses

asymmetrically, a greater understanding of loss firms and how the existence of losses affects firm behavior will inform tax regulators and practitioners about the economic implications of losses. Our findings suggest that to avoid tax surprises, firms should ensure they assess the likelihood and magnitude of potential future losses in NPV estimations for tax planning strategies.

Lastly, we develop a framework for studying tax outcomes during loss years. We utilize the methodology from Dyreng and Lindsey (2009) and augment the analyses beyond pooled loss years. This analysis draws novel insights that the relation between total tax expense and pretax accounting income among loss years depends on loss frequency and magnitude. As such, researchers studying loss years should consider these factors to avoid drawing incorrect or incomplete economic inferences.

II. BACKGROUND, RELATED LITERATURE, AND EMPIRICAL PREDICTIONS

Background and Related Literature

Corporate tax laws in the U.S. and most other countries treat profits and losses asymmetrically, requiring firms to pay tax immediately on profits, while only granting tax benefits for losses based on prior or future profits. During most of our sample period (before the Tax Cuts and Jobs Act of 2017), U.S. corporate tax law allowed firms to claim refunds for U.S. losses up to the amount of U.S. taxes paid in the prior two years (i.e., a two-year carryback period).[3] Firms were also allowed to use U.S. losses to offset U.S. profits for up to 20 years in the future (i.e., a 20-year carryforward period), which was generally valuable if profits in the carryback period were insufficient to absorb current year losses. The use of losses to offset taxable income could also be restricted because of ownership changes or other circumstances (see IRC Section 382).

[3] The two-year loss carryback period and 20-year loss carryforward period began in 1997. For the first couple of years in our sample period, the loss carryback period was three years, and the loss carryforward period was 15 years. Other temporary provisions enacted multiple during our sample period allowed for brief five-year carryback periods during economic downturns (2001 – 2002, 2008 – 2009, and 2020 - 2021) subject to various constraints.

The tax treatment of losses varies across countries, with most countries allowing loss carryforwards of varying duration (Hillmann and Jacob 2025), and some allowing loss carrybacks. For example, as of 2021, Canada had a three-year carryback period, while France, Ireland, the Netherlands, Japan, and the United Kingdom had one-year carryback periods (Asen 2021).[4] Many other countries (including the current U.S. tax regime) do not allow tax loss carrybacks and require firms to carry losses forward to offset future taxable income. While most countries allow for tax loss carryforwards and some countries allow for tax loss carrybacks, companies are generally not allowed to use losses incurred in one jurisdiction to offset profits in another jurisdiction. For example, if a U.S. MNC generates a loss in Canada, those losses might be allowed to offset Canadian income (in the prior three years or in the future) but are not allowed to offset U.S. income at any time.[5]

Firms expecting to receive tax loss benefits, either through carrying back eligible losses to receive refunds of taxes paid in previous years or carrying tax losses forward to offset taxable profits in future years, will accrue a tax benefit on their financial statements. Firms are required to reduce or eliminate the deferred tax benefit of losses if it is more likely than not that the tax benefits of the loss will not be realized in the future (Dhaliwal et al. 2013). If losses recorded on the financial statements on average are associated with an immediate or expected future tax benefit, a positive relation between the magnitude of the loss and total tax benefit emerges, similar to the positive relation between pretax income and tax expense among profit years.

Besides a few notable exceptions (e.g., Henry and Sansing 2018), researchers generally exclude loss firm-years from tax avoidance studies, though they may control for the effects of

[4] Some countries have special rules relating to tax loss carrybacks, including maximum carryback amounts, type of income, etc.

[5] Some countries allow for consolidation of losses across national borders, but these benefits are rarely utilized because of their cumbersome limitations (De Simone et al. 2017).

losses in prior years. The reason for excluding loss firm-years is twofold. First, the economic incentives and behaviors of firms with losses may be different from those of firms with profits (Brown and Drake 2014; Guenther et al. 2019). Second, effective tax rates (ETRs), which are commonly calculated as tax expense divided by pretax earnings and frequently used to measure tax avoidance, are difficult to interpret in loss years. The research methodology we use to study the tax outcomes of loss firms overcomes the usual empirical limitations of traditional ETRs while allowing us to estimate the average tax benefit per dollar of loss.

The potential costs of tax haven operations and other tax planning activities

Although many researchers examine the factors associated with variation in effective tax rates for profit firm-years, we still know relatively little about what factors are associated with variation in the tax benefits of losses. Ironically, it is possible that the very tactics firms use to reduce their tax burdens in profitable years might lead to unfavorable tax outcomes during loss years. For example, prior research shows that MNCs significantly reduce their worldwide tax burdens by shifting income to low-tax jurisdictions, including tax havens, often through intellectual property transfers, cost-sharing agreements, and intrafirm transactions such as royalty or service fees (Klassen and Laplante 2012; De Simone and Sansing 2019; Dyreng et al. 2024). These practices generate abnormally high profits in low-tax countries, and correspondingly low profits in high-tax countries.

A prominent anecdotal example of how tax planning through tax havens can affect loss firms is Xerox. In the late 1990s, Xerox set up significant operations and allocated income to an Irish subsidiary. In 2000, Xerox experienced a loss but reported a higher effective tax rate than in prior years due to the tax strategy. John Hodges, a former treasurer from Xerox, said that the move was a "big mistake" and that "[t]he whole thing was based on increased revenue and profits, but

no one looked at what would happen if these increased revenues and profits didn't occur" (Bandler and Maremont 2001). Indeed, after the tax strategy was implemented, Xerox incurred unexpected losses that were now trapped in Ireland and still reported a profit and paid taxes in the U.S.[6]

One specific firm structure that could create a tax disadvantage in loss years is a Comparable Uncontrolled Price ("CUP") transfer pricing strategy. For example, a U.S. parent entity might manufacture a component and sell it to a low-tax subsidiary that assembles and sells the final product in Europe (rather than the U.S. entity selling the product directly to European customers). In profit years, this arrangement shifts foreign income from high to low-tax jurisdictions, reducing the firm's overall tax rate. However, in an overall loss year, the U.S. parent must still charge the subsidiary the "CUP" price, potentially resulting in a loss in the low-tax jurisdiction, yet profits and tax liabilities in the U.S. Another tax haven strategy with a similar effect arises when a firm moves operations to a low-tax jurisdiction and allocates a significant portion of residual profits to the low-tax subsidiary. In profit years, this will reduce overall taxes, but this strategy could also "trap" losses in the foreign low-tax jurisdiction, causing the firm to incur a tax liability in years in which the firm incurs an overall loss.[7]

We note, however, that there may be settings in which firm structures and transfer pricing do not create a (severe) tax disadvantage in a loss year. For example, firms that are less aggressive and allocate only a modest proportion of profits to a tax haven may face minimal disadvantages

[6] We highlight the Xerox example despite it occurring over 20 years ago because it was widely discussed in business media and is particularly relevant. Our discussions with practitioners indicate that similar tax issues are relatively common among large U.S. MNCs, although these tax issues are not often as prominently disclosed because they may engender reputational concerns for those involved.

[7] A more detailed example of the residual profits example is that the company sets up a subsidiary in a tax haven country such as Ireland, often moving some assets or operations there or locating intangibles. The entity then pays a fixed rate of return, such as a 10 percent markup on its manufacturing costs in the U.S. The residual profit then flows through to the low tax entity. In a loss year, the U.S. entity still has a profit and pays tax, while the loss gets allocated to the lower tax entity and losses are carried forward to offset future income at a lower tax rate. Other transfer pricing methods such as cost sharing arrangements can put the firm at a similar disadvantage in a loss year.

during loss years, though such firms may also forego tax benefits in profit years. Research further suggests that firms can sometimes shift income out of loss subsidiaries or adjust transfer pricing strategies, allowing firms to better capture tax benefits from losses (e.g., De Simone et al. 2017; Hopland et al. 2018). Such findings imply that some firms have sufficient expertise and flexibility to avoid the potential negative consequences of realizing losses in low-tax countries (for example, by shifting income to loss subsidiaries) at the margin. We expect that firms with more frequent losses may be more likely to undertake strategies to mitigate loss-related tax disadvantages. Overall, whether on average tax planning can sufficiently offset any overall negative effect of tax haven use on the tax benefit of losses remains an open empirical question that we seek to address.

III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

We select our sample from all U.S. corporate firm-years in *Compustat* from 1995 to 2024 with at least an average of $10 million in total assets (AT) over the sample period and a non-missing CIK number. Consistent with prior research, we remove financial firms (SIC 6000-6999) and utilities (SIC 4900-4999) because these industries are subject to unique regulations that can potentially alter their tax planning incentives (Mills et al. 1998; Rego 2003; Shackelford et al. 2010). We restrict the sample to firm-year observations representing multinational operations. A firm-year is classified as an MNC if it meets at least one of the following criteria: it reports a non-zero current foreign tax expense (TXFO); it reports non-zero foreign pretax income (PIFO); or it discloses at least one foreign subsidiary in Exhibit 21 of its Form 10-K. We require non-missing values of worldwide total tax expense (TXT) and worldwide pretax income (PI), and include only firms with at least five years of firm-year observations during the sample period.[8] We merge Compustat data with data on tax haven subsidiary disclosures from Exhibit 21 in Form 10-K as

[8] *Compustat* pneumonics are presented in parentheses. We use the procedure described by Dyreng and Lindsey (2009) to replace missing values for our variables which should be zero to increase our sample size.

described in Dyreng and Lindsey (2009).[9] After imposing these criteria, we retain 63,591 firm-years comprised of 4,705 unique firms.

Table 1, Panel A reports descriptive statistics for the sample. For the full sample of firms, mean total worldwide tax expense (*TXT*) is almost two percent of assets (0.018) while mean pretax income (*PI*) is slightly negative (−0.018). Over half of firm-years (55.8%) have tax haven operations (*HAVENYEAR*), and nearly 66 percent (0.656) have a tax loss carryforward (*NOL*). The typical firm has long-term debt (*DLTT*) equivalent to about 20 percent of assets (0.209). Firms report losses in approximately one-third (0.335) of sample years.

In Panels B and C of Table 1, we present descriptive statistics separately for profit ($PI > 0$) and loss ($PI \leq 0$) firm-years. Loss firm-years differ meaningfully from profit firm-years across multiple dimensions: they are less likely to have tax haven operations (*HAVENYEAR* = 0.481 vs. 0.599), are smaller in size (*LNAT* = 5.536 vs. 6.949), and are more likely to carry NOLs (0.826 vs. 0.569). Loss firms also have higher R&D expenditures (*XRD* = 0.116 vs. 0.032) and a substantially lower capacity to utilize losses (*MAG* = 0.277 vs. 0.885). Notably, the average total tax expense in loss years is close to zero (*TXT* = -0.002), and these firms are far more likely to report recurring losses (*PCTLosses* = 0.612 vs. 0.191). For the full sample (Panel A), the correlation (untabulated) between *PI* and *TXT* is 0.42 ($p < 0.01$). This correlation strengthens significantly in profit firm-years (0.72, ($p < 0.01$), but nearly disappears in loss firm-years (0.05, $p < 0.01$).

Figure 1 highlights structural differences between profit and loss firm-years by illustrating how the relationship between worldwide pretax income and total tax expense varies across the income distribution. For profit-years, the steep, positive slope indicates tax expense is increasing with income, while for loss-years, the slightly negative slope suggests limited tax benefits from

[9] Exhibit 21 data are collected as of May 2025. We thank Scott Dyreng for providing us with Exhibit 21 data.

additional losses. The kink at zero pretax income reflects a structural asymmetry: profits are strongly associated with tax expense, but losses are only weakly associated with tax benefits.

IV. RESEARCH DESIGN AND EMPIRICAL RESULTS

Multivariate research framework for studying the tax outcomes of loss firm-years

Our main objective is to investigate whether tax planning strategies that reduce tax payments during profitable years come with a cost by reducing tax benefits in loss years. Given our multinational setting, our measure of tax planning is the presence of a tax haven subsidiary because this is a salient, observable measure of tax planning.

Because we seek to capture the full tax implications of losses, our primary analysis focuses on total tax expense (TXT), which includes both current and deferred tax expense. This focus reflects the broader economic impact of losses, including the potential to derive tax benefits via carrybacks and carryforwards. We propose that tax haven operations not only constrain a firm's ability to realize immediate tax benefits through carrybacks but also reduce the value of deferred tax benefits associated with carryforwards. Specifically, if firms structure their operations to allocate more income to low-tax jurisdictions, the expected future benefit of the loss is reduced due to lower applicable tax rates. For example, if a firm structures its operations so that a greater proportion of sales and costs is allocated to Ireland, a greater proportion of any loss incurred may also be allocated to Ireland (see the examples in Section II). Consequently, the tax loss carryforward will be recouped at the Irish statutory tax rate of 12 cents on the dollar compared to the U.S. statutory rate of 21 cents (35 cents before the TCJA) had the income been allocated to the U.S. Moreover, the firm may end up still paying tax in the U.S. despite the overall loss. This structural effect underscores the importance of using total tax expense to assess the long-term tax costs of tax haven operations.

Traditional tax avoidance research designs that use ETRs as the dependent variable in a regression framework are ill-suited for our research question, as ETRs become difficult to interpret when pretax income is negative. To overcome this limitation, we adopt the methodology used in Dyreng and Lindsey (2009), which allows for the estimation of tax benefits during loss years. In a simplistic form, their model captures the rate of taxation per dollar of pretax income (and how this relation varies with tax haven operations), as captured by this model:

$$TAX = \alpha_1 PI + \alpha_2 PI * HAVENYEAR \quad (1)$$

α_1 can be interpreted like an ETR (i.e., tax per dollar of pretax income). Univariate correlations and a visual inspection of Figure 1 suggest that the effective tax rate α_1 will be different for profit and loss years. That is, while a U.S. firm may currently pay something close to \$0.21 for every \$1.00 of profit, it may not receive a tax benefit of \$0.21 for every \$1.00 of loss. Thus, if firms are unable to utilize losses immediately or at the same tax rate incurred when they are profitable, the resulting tax benefits from losses will be lower than one may expect from a symmetric tax system.

We are particularly interested in examining whether factors that affect the relation between tax payments and profits have, perhaps, counterintuitive effects on the relation between losses and tax benefits. We predict that certain tax avoidance strategies that reduce tax costs in profit years, especially those involving a tax haven, may be responsible for reduced tax benefits from losses. Thus, we are interested in how the coefficient α_2 varies across profit and loss firm-years. To make the model suitable for linear regression, we add an intercept and an error term, and for completeness we include the main effects of all variables. We also include several variables to control for factors that are known to affect ETRs. That is, we estimate the following set of equations to estimate the model separately for profit and loss years:

$$TXT_{it}|PI \geq 0 = \gamma_0 + \gamma_1 PI_{it} + \gamma_2 PI_{it} * HAVENYEAR_{it} + \sum_c \gamma_c PI_{it} * CONTROL_{it}^c + y_1 HAVENYEAR_{it} + \sum_c y_c CONTROL_{it}^c + \epsilon_{it} \quad (2a)$$

$$TXT_{it}|PI < 0 = \beta_0 + \beta_1 PI_{it} + \beta_2 PI * HAVENYEAR_{it} + \sum_c \beta_c PI_{it} * CONTROL_{it}^c + b_1 HAVENYEAR_{it} + \sum_c b_c CONTROL_{it}^c + \epsilon_{it}, \quad (2b)$$

where *TXT* is worldwide total tax expense, *PI* is worldwide pretax book income and *HAVENYEAR* is an indicator variable equal to one if the firm has at least one subsidiary in a tax haven in year *t*.[10] For the vector $CONTROL^c$, we include variables from prior research known to influence tax outcomes, including R&D intensity (*XRD*), an indicator variable equal to one for positive balances of tax loss carryforwards (*NOL*), firm size (*LNAT*), leverage (*DLTT*), and advertising expense (*XAD*). Because prior and current research suggests that the *Compustat* NOL carryforward variable (TLCF) is measured with error (e.g., Mills et al. 2003; Heitzman and Lester 2021; Max et al. 2023), we also include an additional proxy for NOL carryforwards (*NOL2*), which is an indicator variable equal to one if the firm has a cumulative loss over the previous two years ($PI_{t-1} + PI_{t-2} < 0$). Standard errors are clustered by firm. We define all variables in detail in Appendix A.

In the regressions, γ_1 captures the average effective tax rate for observations where pretax earnings are positive (or zero), and β_1 captures the average effective tax rate for observations where pretax earnings are negative, highlighting that one major advantage and research contribution of our regression-based approach to estimating effective tax rates is that the ETR can be estimated for loss firms. Because the regressions contain numerous interactions between continuous variables, which can make interpretation of the main effects difficult, we center all continuous independent variables at their respective means. Thus, β_1 is interpreted as the average effective tax rate for a hypothetical loss firm-year when other binary independent variables equal zero (e.g., *HAVENYEAR* = 0) and values for all continuous control variables (e.g., *LNAT, DLTT*)

[10] It is econometrically equivalent to estimate Eq. (2a) and (2b) together as a single regression, allowing the coefficients to vary based on the sign of *PI*.

equal to their respective means.[11] We estimate our regressions using robust regression based on MM-estimation to mitigate the influence of outliers and ensure valid statistical inferences, as recommended by Leone et al. (2019) and following Dyreng and Lindsey (2009).[12]

We are primarily interested in the coefficients that reflect the effect of tax haven operations on ETRs for profit years, γ_2, and for loss years, β_2. Based on prior research, we expect that γ_2 will be negative, suggesting that the ETR will be lower among profit years with (versus without) tax haven operations. What is unexplored in prior research is what effect tax haven operations will have on ETRs for loss years (i.e., β_2).

Full sample results

We present the full sample results from our regressions in Table 2.[13] To illustrate the importance of separate estimation for loss years, we first estimate the regression without allowing the coefficients to vary across profit and loss observations. The results are reported in Column 1. We find that the coefficient on *PI* is 0.3476 ($p < 0.01$), suggesting that firms report total tax expense equal to approximately 35% of pretax income. In Column 2 and Column 3, we report results from estimating Equations (2a) and (2b), respectively, which allow coefficients to vary depending on whether pretax earnings are positive or negative. In Column 2, the coefficient estimate on *PI* for profit years (0.3488) is similar to the estimate when using the full sample (Column 1), suggesting that the average total tax expense for these firms is around 35% of pretax income, all else equal.

[11] We winsorize all continuous variables at 1% and 99% prior to centering.

[12] Leone et al. (2019) systematically compare methods commonly used in accounting research and find that robust regression consistently outperforms alternatives such as winsorization, truncation, and standard influence diagnostics. Robust regression based on MM-estimation is designed to down-weight influential observations that can distort parameter estimates and statistical inference. Some outliers receive a weight of zero in the regressions, and for this reason, N varies slightly from table to table. Unlike winsorization or truncation, which can fail to identify influential data points, robust regression uses the full dataset while reducing the influence of outliers. We omit the R-squared from the regressions because Leone et al. (2019) suggest that it is not a reliable criterion to assess fit in robust regression. We verify that our inferences remain the same using other outlier control methods, including removing observations with large leverage points and large values of Cook's distance.

[13] While we do not tabulate them, all regressions include the main effects of all variables interacted with *PI*.

In Column 2, the estimate for γ_2 is -0.0133 ($p < 0.01$), suggesting the average ETR is lower by 1.33 percentage points for profit years with tax haven operations. Both results are consistent with the findings in prior research regarding the worldwide tax rates of profitable U.S. firms that use tax havens to lower corporate tax burdens (e.g., Dyreng and Lindsey 2009; Hope et al. 2013; Law and Mills 2022). The control variables also align with prior research: firms with higher levels of R&D, tax loss carryforwards, and debt all have lower effective tax rates.

In Column 3, we report the results for loss firm-years. The coefficient on *PI* is -0.0050 ($p < 0.01$), indicating that for each additional dollar of pretax loss, firms report an *increase* of approximately \$0.005 in total tax expense.[14] This counterintuitive result suggests that, on average, loss firms do not receive a meaningful tax benefit in the current period, possibly due to a valuation allowance, and may even recognize positive total tax expense. We find that the coefficient on the interaction of *PI* and *HAVENYEAR* is positive and marginally significant ($\beta_2 = 0.0004$, $p < 0.10$), suggesting that the negative relation between pretax income and tax expense for loss years is attenuated for firms with tax haven operations. In economic terms, haven firms report approximately -0.0046 in total tax expense per dollar of loss, compared to -\$0.0050 for non-haven firms. Although the sign of the estimate on the interaction is inconsistent with the notion that tax haven activity reduces the tax benefits of losses, the magnitude is economically small.

The distinct differences in coefficients across Columns 2 and 3 highlight the importance of allowing the effective tax rate to vary across profit and loss years. While the relationship between pretax income and total tax expense in the full sample is similar to the observed estimates for profit years, this is not the case for loss years, suggesting that pooling all observations obscures meaningful variation in how tax expense responds to earnings. Additionally, in Column 2, among

[14] Edwards et al. (2022) similarly find that not only do loss firms pay taxes, but that the amount of taxes paid is increasing in the magnitude of the loss.

profit firm-years, we find that the coefficient on *PI*XRD* is -0.3007, suggesting that a one standard deviation increase in R&D expense is associated with a $0.0165 decrease in total tax expense per dollar of pretax income. For loss years, however, we find that the coefficient on *PI*XRD* is 0.0018, indicating that a one standard deviation increase in R&D expense is associated with a $0.0003 increase in total tax expense per dollar of pretax loss. This comparison suggests that profit and loss firm-years are fundamentally different, and that including both types of observations in a linear regression without accounting for the nonlinearity that occurs in the region at zero profit could lead to inferences that are misleading or difficult to interpret.

Loss subsample analysis

Table 2 suggests that the accrued tax benefits from losses in the pooled sample of loss firm years are economically quite small when examining the full sample of loss years. We argue that this muted relationship may reflect meaningful heterogeneity among loss firms related to (1) the frequency of losses and (2) the magnitude of losses relative to prior pretax income, as these two factors undoubtedly influence a firm's ability to realize tax benefits from losses (Bruce et al. 1998; Miller and Skinner 1998). For example, firms with frequent losses are less likely to realize current tax benefits from a loss, as such benefits typically require recent taxable income. Throughout much of our sample period, a U.S. firm with a current domestic loss and no taxable income in the prior two years could not claim a current tax refund.[15] Persistent losses also increase the likelihood of valuation allowances that limit deferred tax benefits and reduce firms' ability to utilize the benefits of tax planning during profit years.

Second, the magnitude of the current loss relative to prior profits is a critical determinant

[15] Complicating matters further, tax benefits from losses are generally determined jurisdiction by jurisdiction. Thus, if a firm loses money in a foreign country, it cannot use those losses as a claim for refund against taxes previously paid to the U.S.

of whether the loss can generate a meaningful tax benefit. Even if a firm has reported profits in the past, a current-year loss that exceeds those prior earnings may not be fully utilizable. In essence, the tax value of a loss depends not just on its presence but also on whether there is sufficient prior or future income against which it can be applied. Firms with larger losses relative to their pretax income history are less likely to see those losses translate into reduced tax expense, limiting the economic benefit of the loss for tax purposes.

Together, these dimensions highlight that loss firm-years are not homogeneous. Firms with prior profits and less frequent losses are more likely to benefit from loss-related tax provisions, all else equal. Accordingly, researchers studying loss firm years may want to forego pooling all loss years and instead focus on subsamples where the likelihood of realizing tax benefits from losses aligns with the research question. For example, our research question is interested in whether the tax benefits of losses are reduced for firms that seem capable of utilizing the benefits of tax losses. Thus, the following analyses focus on these types of firms.

Sample description

To identify a targeted subsample where tax benefits from losses are more likely to be realized, we remove firms from our loss sample that report a loss in every year they appear in our sample, as these persistently unprofitable firms are unlikely to benefit from current-year losses for tax purposes. Thus, we retain 18,584 loss firm-year observations from 3,575 unique firms. To examine loss frequency, we use *PCTLosses,* which measure the percentage of years within the sample period in which a firm reports negative pretax income. We group the firms into four categories based on the frequency of their losses: greater than 0 to 25%, greater than 25 to 50%, greater than 50 to 75%, and greater than 75% but less than 100%. To examine the magnitude of the current-year loss relative to prior profitability, we construct *MAG*, which is an indicator

variable equal to 1 if the sum of the current year's loss and the cumulative pretax income (or loss) over the prior five years is positive, and 0 otherwise.[16] A value of 1 indicates that the firm has sufficient prior profits to absorb a current year loss, implying a greater potential to utilize tax benefits associated with the loss. In contrast, a value of 0 suggests that the current year loss exceeds prior profits, limiting the firm's ability to benefit from the tax effects of the loss.

In Table 3, we present descriptive statistics by firm-level loss frequency (*PCTLosses*), where we categorize firms based on the proportion of years in which they report a loss. Thus, the reported statistics reflect the characteristics of firm-year observations within each loss-frequency group. We observe that *TXT* becomes closer to zero as firms experience more losses. Additionally, firms with higher loss frequencies are less likely to operate in tax havens (*HAVENYEAR*), suggesting that sustained unprofitability may limit the feasibility or strategic value of international tax planning. Similarly, *MAG*, our measure of the firm's capacity to absorb current-year losses using prior profits, decreases as loss frequency increases, indicating that persistent loss firms often lack cumulative earnings to benefit from tax loss carrybacks or carryforwards.

In untabulated results, we examine correlations for loss firm-years by loss frequency (*PCTLosses*). The correlation between *PI* and *TXT* is strongest for firms with infrequent losses and weakens as loss frequency increases, suggesting that firms with more stable earnings histories face more predictable tax outcomes. We observe a similar pattern for *HAVENYEAR* and *TXT*, where the positive association diminishes as losses become more frequent. These patterns suggest that

[16] The carryback period in the U.S. has varied over time. During most of our sample period (prior to the Tax Cuts and Jobs Act of 2017), a two-year carryback period was the most common in the U.S. tax code. However, the carryback period was three years during the first couple of years of our sample period, and Congress enacted brief, temporary five-year carryback periods during economic downturns during our sample period, subject to various constraints. In other jurisdictions, carryback periods range from one year to an infinite number of carryback years (or no carryback provision), as described in the background section. Given these variations, we use a five-year carryback window, providing an upper-bound estimate of potential refund eligibility. While all of our firms are U.S. MNCs, we acknowledge that this approach may introduce measurement error for firms with taxes paid in jurisdictions that do not allow a five-year carryback.

the tax benefit from both losses and tax haven operations is more pronounced when losses are rare and less salient for persistently unprofitable firms.

In Table 4, we present the descriptive statistics for loss firms, grouped by *MAG* for loss firm-years. When *MAG* equals 1, this suggests a firm has sufficient profits to absorb a current year loss, reflecting a greater potential to realize tax benefits. A value of 0, by contrast, suggests limited capacity to use losses for tax relief. Table 4 shows that loss years with *MAG* = 1 exhibit higher *PI*, are more likely to have tax haven operations (*HAVENYEAR*), and are less likely to experience frequent losses (*PCTLosses*). These patterns suggest that firms in a stronger tax position, both in terms of profitability and loss utilization, are also more likely to engage in tax planning strategies such as establishing haven subsidiaries.[17]

Figure 2 illustrates the relationship between *PI* and *TXT* (i.e., the tax benefit) for loss firm-years. Panel A presents the results for the full sample of loss-firm years, disaggregated by loss frequency and whether the firm-year is classified as operating in a tax haven. In this panel, the slope of the fitted line becomes progressively flatter as loss frequency increases, indicating a weaker relationship between pretax income and tax expense for firms that report losses more frequently. Moreover, within each loss frequency group, firm-years with tax haven operations exhibit flatter slopes than their non-haven counterparts. The differences in slopes between haven and non-haven firm-years are statistically significant for the >0-25% and >25%-50% loss frequency categories.[18] These patterns suggest that loss-firm years with haven operations realize

[17] In an untabulated analysis, we examine correlations for the loss by *MAG*. For loss observations where *MAG* = 1, the positive correlation between *PI* and *TXT* is stronger, consistent with the relation between pretax income and tax outcomes being more direct when firms likely have sufficient prior profits to utilize losses. Moreover, the correlation between *PI* and *HAVENYEAR* is also stronger for observations where *MAG* = 1, implying that tax haven activity is more closely tied to profitability in loss years when the firm is positioned to realize tax benefits.

[18] One exception occurs in the >50%–75% loss frequency category, where tax haven firm-years exhibit a significantly steeper slope. However, this deviation does not alter the overall pattern of reduced tax responsiveness associated with tax haven operations.

smaller tax benefits per dollar of pretax income, highlighting a potential cost of tax planning in the form of diminished tax responsiveness during loss years.[19]

Figure 2 Panel B restricts the sample to loss firm-years with *MAG*=1, which reflects the firm's ability to utilize current-year losses. Except for the >50-75% loss frequency group, the slopes again significantly flatten as the frequency of losses increases, reinforcing the notion that repeated losses erode the association between pretax income and tax expense. Compared to Panel A, the slopes in Panel B are generally steeper, suggesting that when firms are better able to utilize losses, they receive a greater tax benefit per dollar of income. Even within this subset, haven firm-years continue to exhibit flatter slopes than non-haven firm years, indicating a lower tax benefit from losses, with the exception of the 50-75% category. The differences in slopes between haven and non-haven firm-years are statistically significant for loss frequency categories except the >75%-100% group. Taken together, the figures suggest that although a better ability to use losses (*MAG* = 1) strengthens the relationship between income and tax expense, the presence of tax haven operations often reduces the magnitude of tax benefits realized in loss years.

To examine whether tax haven use is associated with diminished tax benefits from losses, we estimate Eq. (2b) for the loss subsample using: (1) *PCTLosses* categories to capture variation in the frequency of losses, (2) *MAG* to capture the magnitude of the current-year loss relative to prior profits, and (3) combinations of *PCTLosses* and *MAG* to isolate firms most likely to utilize tax benefits from current-year losses. We report results in Tables 5-7.

Loss Results: Frequency and Magnitude

[19] An untabulated figure provides the same breakdown for profit-firm years and reveals that as expected, the stope is steeper overall for firm-years without tax haven operations. Consistent with our main findings, tax haven firm-years exhibit flatter stopes across all loss frequency categories, with the exception of the >50%-75% loss frequency group. The differences in slopes between tax haven and non-haven firm-years are statistically significant for all loss frequency categories except the >50%-75% group. These results are consistent with the idea that tax haven operations reduce total tax expense in profit years.

In Table 5, we present results from estimating Eq. (2b) for loss firms grouped by loss frequency. In Column 1, where *PCTLosses* > 0 but less than 25%, the coefficient on *PI* is 0.2396 ($p < 0.01$), suggesting that loss observations in this subsample accrue a tax benefit of about $0.24 per $1.00 of loss. While the magnitude of this coefficient is far greater than reported with all loss firm-years in Table 2, these are firms with infrequent losses, and we believe this subsample of firm-years is in the best position to generate tax benefits from losses.

Turning to our variable of interest, *HAVENYEAR*, we find in Column 1 that the interaction of *PI* and *HAVENYEAR* is significantly negative ($\gamma_2 = -0.0544$, $p < 0.05$), suggesting that observations in this subsample with tax haven operations receive lower tax benefits during loss years than firms without haven operations. In terms of economic significance, the mean unscaled pretax loss for firms in this sample is approximately $491.28 million (untabulated). Thus, the average loss year in this sample accrues a tax benefit of approximately $0.2396 per dollar of pretax loss, resulting in approximately a $117.66 million accrued tax loss benefit. In contrast, firms with tax haven operations on average receive an approximately 22.7 percent reduction in their tax loss benefit compared to non-haven firm-years. ($\gamma_2 = -0.0544 \div \gamma_1 = 0.2396 = -0.227$). This suggests that, on average, these firms accrue a tax benefit of only $0.1852 per dollar of pretax loss, resulting in a total tax benefit of approximately $90.96 million. Thus, we estimate that foreign tax haven use, on average, is associated with a reduced tax benefit of $26.7 million per loss year.

We present results from estimating Equation (2b) for loss firms with more frequent losses in Columns 2 through 4. We find that the strength of the relationship between pretax income and total tax expense decreases as the frequency of losses increases. Compared to the coefficient of 0.2396 in Column 1, which implies that firms accrue approximately $0.24 in total tax expense reduction per dollar of pretax book loss, the estimated decrease in total tax expense per dollar of

PI drops to \$0.0102 (γ_1 = 0.0102, p > 0.10) for firms in 25%-<50% loss frequency category, -\$0.0067 (γ_1 = -0.0067, p < 0.01) for firms in 50%-<75% loss frequency category, and just \$0.0009 (γ_1 = 0.0009, p > 0.05) for firms in 75%-<100% loss frequency category. This pattern suggests that firms with more frequent losses accrue minimal benefits from current-year losses, likely due to valuation allowances or limits on the use of carrybacks and carryforwards. Given the relatively weak relation between pretax income and total tax expense in the presence of frequent losses (*PCTLosses* >= 25%), it is not surprising that the presence of tax haven operations (i.e., *HAVENYEAR*) does little to moderate the relation.

Overall, the results in Table 5 provide evidence consistent with tax haven operations being associated with increased tax benefits (i.e., reduced tax burdens) during profit years, yet lower tax benefits during loss years. This effect is particularly salient for firms with infrequent losses (losses in fewer than 25% of firm-years), suggesting that these tax costs emerge most strongly when losses are unexpected or temporary. Thus, firms that engage in significant tax planning and tax-motivated firm restructuring in anticipation of profits could incur a nontrivial tax cost to tax planning, resulting in diminished tax benefits from losses by not being able to realize the tax benefits from such losses. Since recent research suggests that tax savings are an important source of cash, especially for financially constrained firms (Law and Mills 2015; Edwards et al. 2016), a reduced ability to generate tax benefits from tax loss carrybacks during loss years could impose a significant cost to tax planning. Thus, our results suggest that tax haven usage may increase tax risk to the extent that the firm incurs losses.

In Table 6, we present results from estimating Eq. (2b) for the subsample of loss firm-years, portioned by the relative magnitude of current-year loss to prior-year profits, as captured by *MAG*. Column 1 reports results for firm-years with *MAG* = 0, which represents firms that are likely

less able to utilize losses due to insufficient prior profits. For this group, we find that the coefficient on *PI* is -0.0027 ($p > 0.10$), indicating a statistically insignificant relation between pretax income and total tax expense for these loss years. In contrast, in Column 2, which includes observations where *MAG* = 1, the coefficient on *PI* is 0.2565 ($p < 0.001$), implying that these firms reduce total tax expense by $0.26 per dollar of pretax book loss, suggesting they are able to effectively utilize the tax benefit of the loss.

In Table 6 the coefficient on *PI*HAVENYEAR* is statistically non-zero in both columns. In Column 1, the coefficient is 0.0011 ($p < 0.001$). Although this coefficient is statistically significant, it is economically small, implying that tax haven operations have little effect on tax outcomes when firms are largely unable to benefit from losses. However, in Column 2, for firms with the capacity to utilize losses, the coefficient on the interaction is -0.0435 ($p < .05$). This suggests that the presence of tax haven operations reduces the tax benefit from losses by roughly $0.17 per dollar of pretax loss compared to $0.26 for non-haven operations (-0.0435 ÷ 0.2565). These results suggest that firms with tax haven operations and a greater capacity to utilize current-year losses incur a substantial tax cost when performance turns negative.

In Table 7, we present results from estimating Eq. (2b) for the subsample of loss firm-years, partitioned jointly by the relative magnitude of current-year loss to prior-year profits, as captured by *MAG* and by the frequency of losses. Panel A reports results for firm-years with *MAG* = 0 and Panel B reports results for firm-years with *MAG* = 1. Consistent with our prior findings, we observe that the coefficient on *PI* is larger in Panel B than in Panel A, suggesting that firms with the capacity to utilize losses reduce total tax expense more per dollar of pretax loss than firms without such capacity. In Column 1 of Panel B, we find that firms with infrequent losses and *MAG* = 1 accrue a sizeable $0.3053 tax benefit per $1 of pretax loss. In Panel B, the coefficient on *PI*

decreases as the frequency of losses increases, suggesting firms with persistent losses are less able to benefit from tax loss provisions.

In Panel B, Column 1, the coefficient on *PI*HAVENYEAR* is negative and statistically significant (firms with infrequent losses), indicating that tax haven operations are associated with a 31.64 percent (-0.0966/0.3053) reduction in tax benefits from losses. These findings support our overall interpretation that tax haven use may lower tax burdens during profitable years, but it can carry meaningful tax costs in loss years, particularly for firms that would otherwise be well-positioned to realize tax loss benefits, such as firms experiencing infrequent or unexpected losses.

V. ADDITIONAL ANALYSES

Evidence of tax planning during profit years

A potential criticism of our results could be that the reduced tax benefits we document for loss firm-years are not the result of tax planning by the same firms that derive tax benefits during profit firm-years. Instead, it may be that our loss sample comprises firms that are poor tax planners both in profit years and loss years. To address this concern, we examine profit-firm years to assess whether tax haven benefits persist even when firms are not constrained by losses. Unlike loss-firm years, where the ability to utilize tax benefits is limited, profit years provide a clearer test of whether haven operations reduce total tax expense. For this reason, we also estimate Equation (2a) for profit firm-years for the same sample of firms from Table 5. In Table 8, we present results for the profit firm-years associated with the firms with current losses from the same Columns 1 through 4 of Table 5. For example, in Column 1, we include the 18,611 profit firm-years for the same sample of firms associated with the 2,829 loss firm-years (Table 5, Column 1).[20] Across all

[20] For example, suppose Firm A appears 15 times in our sample, with 15 unique firm years. Of these 15 firm years, 5 incurred losses and 10 recognized positive pretax income (i.e., profits) for the year. The 5 loss observations are included in the loss subsample, and the 10 profit observations are included in the profit subsample. Of its 15 firm years, Firm A incurred a loss in 33%, meaning its *PCTLosses* group is ">25- 50%".

columns, we find that inferences for the profit years in this subsample are similar to those for the entire profit sample, suggesting that the firms in this subsample utilize tax havens to reduce tax burdens during profit years. As shown in Table 8, the coefficient on *PI* remains relatively stable across loss frequencies, suggesting consistent tax planning behavior. The negative and significant *PI***HAVENYEAR* coefficient in Columns 1 and 2 indicates that haven operations reduce total tax expense in profit years. However, the insignificant result in Columns 3 and 4 suggests that even in profit years, firms with frequent past losses may be unable to fully capitalize on haven structures.

Estimates of tax rates on foreign and domestic income

Following Dyreng and Lindsey (2009), we bifurcate pretax worldwide income *(PI)* into pretax U.S. domestic income (*PIDOM*) and pretax foreign income (*PIFO*) and estimate the total tax loss benefit associated with both sources of losses. We expand Equation (2b) by replacing *PI* with both *PIDOM* and *PIFO* and interacting each of these variables with *HAVENYEAR* and all control variables.[21] We present results in Table 9 across the four loss frequency thresholds. In Column 1 (firms with less than 25 percent loss years), we find that the total worldwide tax benefit on pretax domestic income (*PIDOM*) is $0.28 per dollar of pretax domestic income (Coef = 0.2754, $p < 0.01$) as compared to $0.11 per dollar of *PIFO* (Coef = 0.1110, $p < 0.05$). Thus, on average, firms with losses appear to accrue larger total tax loss benefits from U.S. losses. We also find that the reduction in accrued tax loss benefits for firms with tax haven operations is most concentrated in foreign losses. The coefficient on *PIFO***HAVENYEAR* is -0.1141 ($p < 0.01$), basically eliminating any foreign tax benefit from losses. Meanwhile, the coefficient on *PIDOM***HAVENYEAR* is -0.0615 ($p < 0.05$) is smaller in comparison to the foreign effect but is still economically meaningful. As firms structure their operations to reduce taxes during profit

[21] We split *NOL2* into separate indicator variables for cumulative PIDOM losses (*NOL2DOM*) and PIFO losses (*NOL2FOR*).

years (e.g., Xerox), these operational changes often allocate more income to foreign sources. Our evidence suggests such structures may "trap" losses in foreign tax haven jurisdictions, reducing the tax benefits from losses due to the lower tax rates associated with tax havens.

Tax Cuts and Jobs Act

The Tax Cuts and Jobs Act (TCJA) of 2017 introduced sweeping changes to the U.S. tax code. Notably, it reduced the federal corporate statutory rate to 21% and overhauled the taxation of foreign income, including the introduction of a participation exemption system, which allowed corporations to repatriate income from foreign subsidiaries with no tax consequences, and provisions such as GILTI. Importantly for our analysis, the TCJA eliminated the federal NOL carryback provision, which had previously allowed firms to recover taxes paid in prior profitable years. While the CARES Act temporarily reinstated NOL carrybacks, the overall shift in loss utilization under TCJA remains a significant structural change. To evaluate how the relationship between tax haven operations and tax benefits from losses evolved post-reform, in an untabulated analysis, we estimate a model with a triple interaction term (*PI*HAVENYEAR*POST_TCJA*). We find a positive but insignificant coefficient on *PI*HAVENYEAR*POST_TCJA,* suggesting that the TCJA did not meaningfully alter our inferences.

Cross-sectional tests

We identify several cross-sections where the use of tax haven operations is more likely to result in a tax cost during loss years, consistent with the notion that such strategies may constrain firms' ability to realize tax benefits from losses.

First, we examine the type of tax haven jurisdiction. We distinguish between Big Havens (i.e., jurisdictions with more economic substance, such as Ireland and Switzerland) and "dot" havens, which are usually small island jurisdictions that are often used for statutory rate arbitrage

with minimal substance.[22] From discussions with practitioners, low tax countries with greater operations generally have more risk (both upside and downside), whereas dot havens often have a structure with fixed income they earn from high-tax countries with less downside risk. In Table 10, we find evidence consistent with our practitioner discussions that the negative and significant effect of *PI*HAVENYEAR* for firms with a >0 -<25% loss frequency is concentrated among operations in Big Havens.

Second, we focus on firms with a greater capacity to utilize carrybacks by identifying two subsamples of transient loss firms: (1) firms with at least two years of profits in the prior five years, and (2) firms with a positive cumulative pretax income over the prior five years. In untabulated tests, the coefficient on *PI*HAVENYEAR* remains negative and significant for firms with >0 - <25% and 25% - <50% loss frequencies in both subsamples. These results reaffirm that the presence of tax haven operations is associated with a reduction in tax benefits during infrequent loss years, even for firms that seemingly have the capacity to absorb the loss.

Finally, we examine whether the tax costs of haven operations are concentrated in mobile income industries, where firms have a greater ability to shift income to low-tax jurisdictions. Using a triple interaction term (*PI*HAVENYEAR*M_IND*), we find that the coefficient on this term is negative and significant for firms with a >0 -<25% loss frequency (untabulated), consistent with mobile income industry firms experiencing greater tax costs from tax haven operations in loss years. This suggests that the very flexibility that facilitates profit shifting during profitable periods may impede the recognition of tax benefits during loss years.

[22] Following Dyreng and Lindsey (2009) we modify the list of Big Havens in Hines and Rice (1994) to include Ireland, Lebanon, Panama, Singapore, Switzerland, and Liberia. Results are qualitatively similar if we include Hong Kong as a Big Haven, consistent with Hines and Rice (1994). Our findings are robust to an alternative "Big Haven" classification that includes the Netherlands, Cayman Islands, Switzerland, Luxembourg, and Singapore (Murphy and Vernon 2025).

VI. CONCLUSION

In this study, we explore whether foreign tax haven use results in reduced tax benefits from losses. Using the methodology from Dyreng and Lindsey (2009), we estimate the average tax benefit per dollar of pretax book loss for loss firm-years using linear regression. Our results indicate that tax haven operations are associated with increased tax benefits for profit years, yet have diminished tax benefits during loss years. These results highlight a potential cost of international tax planning: diminished tax benefits from losses.

Our paper contributes to the tax avoidance literature by showing that tax-planning firms may incur a nontrivial economic cost to tax planning when they realize a loss, resulting in diminished tax benefits. We also make a methodological contribution by demonstrating how to estimate the tax benefits of losses using a simple linear regression, which we use to highlight the differences in tax outcomes across profit and loss firm-years.

Our paper serves as one of the few studies that examines the behaviors and incentives of loss firms (Hanlon and Heitzman 2010). Future research is needed to examine how incentives, agency conflicts, and other firm-specific factors affect the tax outcomes of firms with losses. Moreover, future research can also investigate whether the anticipation of potential future losses deters managers from engaging in certain tax planning strategies.

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APPENDIX A

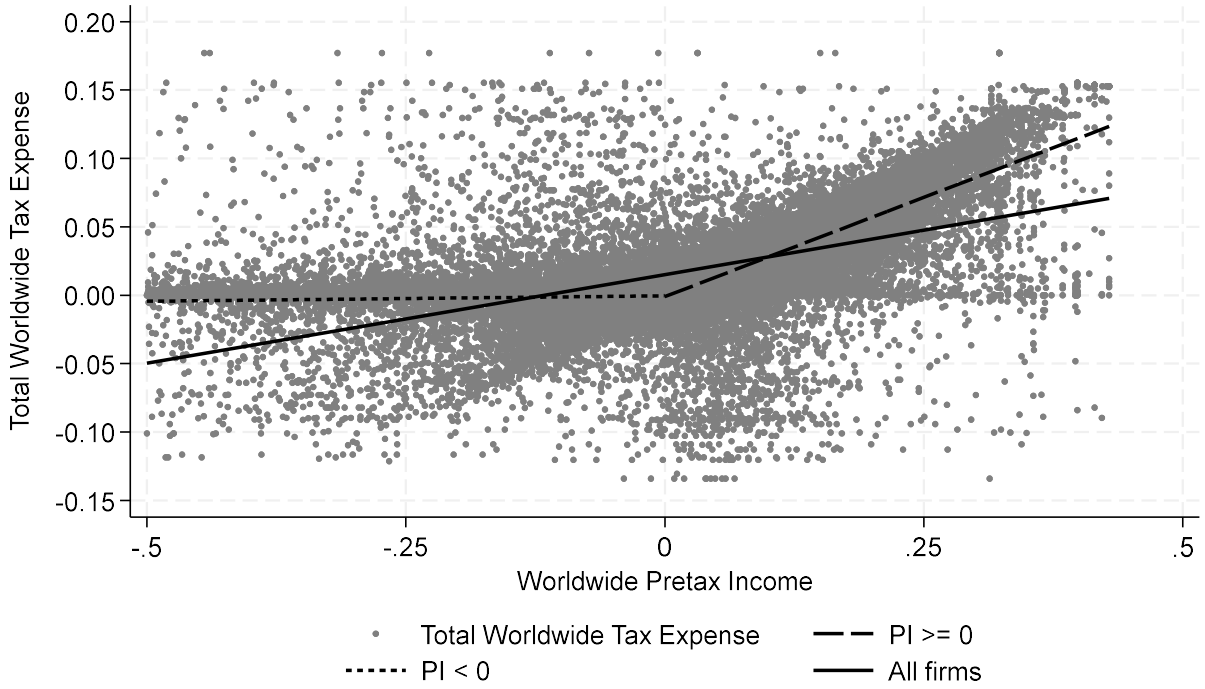
Variable definitions

DLTT	Total long-term debt (DLTT, missing values set to 0) scaled by total assets.
HAVENYEAR	Indicates that the firm has at least one material operation in a tax haven country in year *t*.
LNAT	The log of total assets (AT).
MAG	Indicates that the sum of the current year pretax income and the cumulative pretax income over the prior five years is positive.
NOL	Indicates that the firm had a net operating loss at the beginning of the year, based on the tax loss carryforward variable from *Compustat* (TLCF). Missing values are set to Max et al.'s (2021) imputed TLCF variable.
NOL2	Indicates that the firm has a cumulative worldwide pretax book loss over the previous two years ($PI_{t-1} + PI_{t+2} \leq 0$).
NOL2DOM	Indicates that the firm has a cumulative U.S. domestic pretax book loss over the previous two years ($PIDOM_{t-1} + PIDOM_{t+2} \leq 0$).
NOL2FOR	Indicates that the firm has a cumulative foreign pretax book loss over the previous two years ($PIFO_{t-1} + PIFO_{t+2} \leq 0$).
Num_BigHAVEN	The log of the number of subsidiaries in a "Big" tax haven country in year *t*.
Num_DotHAVEN	The log of the number of subsidiaries in a non "Big" tax haven country in year *t*.
PCTLosses	Number of years the firm has a worldwide pretax book loss divided by the total number of years in our sample period.
PI	Worldwide pretax income (PI) scaled by total assets.
PIFO	Pretax foreign income (PIFO) scaled by total assets.
PIDOM	Pretax U.S. domestic income (PIFO) scaled by total assets.
TXT	Total tax expense (TXT) scaled by total assets.
XAD	Advertising expense (XAD, missing values set to 0) scaled by total assets.
XRD	Research and development expense (XRD, missing values set to 0) scaled by total assets.

Notes: This appendix presents definitions for the variables used in the study. All continuous variables are winsorized at 0% and 99%. *Compustat* pneumonics are presented in parenthesis in non-italics.

FIGURE 1

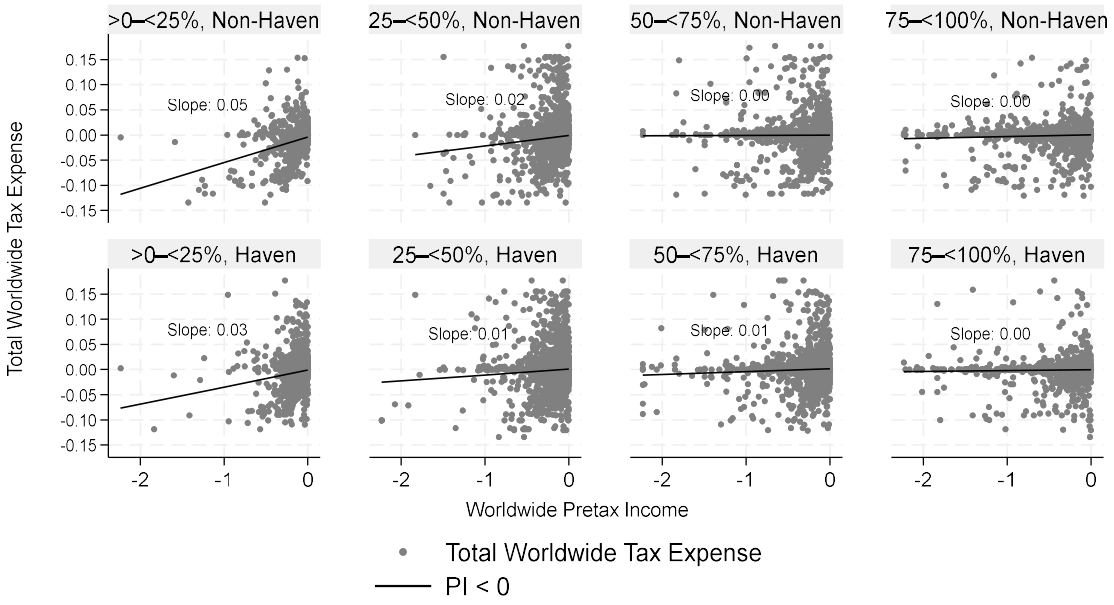
Scatter plot of total worldwide tax expense and pretax income



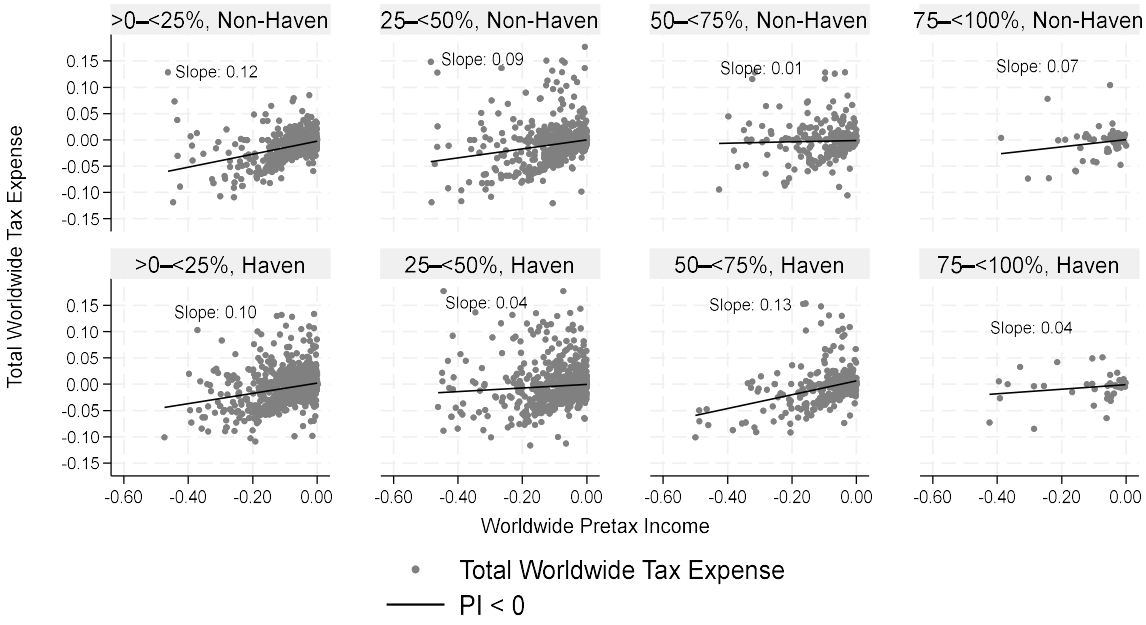
Notes: This figure presents a scatter of total worldwide tax expense and pretax income (both scaled by total assets). We limit the sample for purposes of this graph to firms where *PI* (Pretax income scaled by total assets) is within the range of −0.5 to 0.5.

FIGURE 2
Scatter plot of total worldwide tax expense and pretax income by loss frequency and magnitude

Panel A: Loss Firm-Years by Loss Frequency and Haven Status



Panel B: Loss Firm-Years with MAG = 1, by Loss Frequency and Haven Status



Notes: This figure presents a scatter of current worldwide tax expense and pretax income (both scaled by total assets) for loss-firm years. Panel A displays the relationship by loss frequency category and whether the firm-year is classified as operating in a tax haven or not. Panel B restricts the sample to firm-years with *MAG*=1 (i.e., firms with the ability to utilize current-year losses) and shows the same breakdown by loss frequency and haven status.

TABLE 1

Descriptive Statistics

Panel A: Full sample						
Variable	N	Mean	Std. Dev.	P25	P50	P75
TXT	63,591	0.018	0.032	0.000	0.012	0.032
PI	63,591	-0.018	0.260	-0.044	0.043	0.103
HAVENYEAR	63,591	0.558	0.497	0.000	1.000	1.000
XRD	63,591	0.060	0.114	0.000	0.011	0.075
NOL	63,591	0.656	0.475	0.000	1.000	1.000
NOL2	63,591	0.313	0.464	0.000	0.000	1.000
LNAT	63,591	6.467	2.069	5.016	6.457	7.856
DLTT	63,591	0.209	0.228	0.008	0.153	0.324
XAD	63,591	0.012	0.033	0.000	0.000	0.007
PCTLOSSES	63,591	0.335	0.305	0.067	0.240	0.533
MAG	53,313	0.693	0.461	0.000	1.000	1.000
Panel B: Profit firm-years						
Variable	N	Mean	Std. Dev.	P25	P50	P75
TXT	41,916	0.028	0.030	0.010	0.023	0.041
PI	41,916	0.099	0.075	0.044	0.082	0.134
HAVENYEAR	41,916	0.599	0.490	0.000	1.000	1.000
XRD	41,916	0.032	0.055	0.000	0.006	0.042
NOL	41,916	0.569	0.495	0.000	1.000	1.000
NOL2	41,916	0.137	0.344	0.000	0.000	0.000
LNAT	41,916	6.949	1.950	5.626	6.936	8.231
DLTT	41,916	0.203	0.202	0.019	0.167	0.312
XAD	41,916	0.013	0.032	0.000	0.000	0.008
PCTLOSSES	41,916	0.191	0.198	0.033	0.133	0.300
MAG	36,503	0.885	0.319	1.000	1.000	1.000
Panel C: Loss firm-years						
Variable	N	Mean	Std. Dev.	P25	P50	P75
TXT	21,675	-0.002	0.027	-0.006	0.000	0.003
PI	21,675	-0.244	0.330	-0.305	-0.119	-0.041
HAVENYEAR	21,675	0.481	0.500	0.000	0.000	1.000
XRD	21,675	0.116	0.167	0.000	0.046	0.168
NOL	21,675	0.826	0.379	1.000	1.000	1.000
NOL2	21,675	0.653	0.476	0.000	1.000	1.000
LNAT	21,675	5.536	1.972	4.139	5.466	6.828
DLTT	21,675	0.221	0.270	0.001	0.111	0.363
XAD	21,675	0.012	0.034	0.000	0.000	0.006
PCTLOSSES	21,675	0.612	0.283	0.375	0.625	0.875
MAG	16,810	0.277	0.448	0.000	0.000	1.000

Notes: This table presents the descriptive statistics for our regression variables for the full sample, profit firm-years, and loss firm-years. All variables are defined in Appendix A.

TABLE 2

Estimates of the Effect of Tax Havens on Worldwide Current Tax Outcomes for Profit and Loss Firm-years

		All firms	Profit firm-years only $PI \geq 0$	Loss firm-years only $PI < 0$
		(1)	(2)	(3)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0055***	-0.0076***	-0.0033***
		(-29.29)	(-15.32)	(-11.47)
PI	+	0.3476***	0.3488***	-0.0050***
		(181.61)	(52.05)	(-8.56)
*PI*HAVENYEAR*	−	-0.0030***	-0.0133***	0.0004*
		(-7.38)	(-3.87)	(1.78)
*PI*XRD*	−	-0.0122***	-0.3007***	0.0018***
		(-11.69)	(-2.61)	(4.29)
*PI*NOL*	−	-0.0397***	-0.0182***	0.0036***
		(-7.37)	(-4.68)	(6.89)
*PI*NOL2*	−	-0.3024***	-0.0355***	0.0018***
		(-57.59)	(-2.98)	(5.37)
*PI*LNAT*	−	-0.0007***	-0.0086***	-0.0002***
		(-4.87)	(-5.69)	(-3.46)
*PI*DLTT*	−	-0.0005	-0.0737**	0.0010***
		(-0.79)	(-2.32)	(2.72)
*PI*XAD*	+	0.0092	0.0211	-0.0049
		(1.38)	(0.39)	(-1.11)
N Obs.		63,591	41,915	21,675
N Obs. with non-zero weight		55,895	38,359	17,784
Clustered SE		Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for the pooled sample of profit and loss firm-years (Column 1) and separately for profit ($PI \geq 0$) and loss ($PI < 0$) firm-years, using Equations (2a) and (2b). *TXT* is the total tax expense or benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.

TABLE 3

Loss firm-year sample by PCTLosses

Panel A: Loss firm-year sample selection

Criteria	Firm-years
Total firm-years	63,591
Less:	
Profit firm-year observations	(41,916)
Loss firm-year observations with 100% loss frequency during the sample period	(3,091)
Total loss firm-years	**18,584**
Unique firms	**3,575**

Panel B: Loss-firm year descriptive statistics

	PCTLosses >0 - <25% N = 2,829			**PCTLosses 25 - <50% N = 4,837**			**PCTLosses 50 - <75% N = 5,762**			**PCTLosses 75- <100% N = 5,156**		
Variable	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
TXT	-0.01	0.03	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.02	0.00
PI	-0.10	0.16	-0.05	-0.13	0.19	-0.06	-0.20	0.27	-0.11	-0.33	0.37	-0.20
HAVENYEAR	0.62	0.48	1.00	0.53	0.50	1.00	0.47	0.50	0.00	0.44	0.50	0.00
XRD	0.03	0.06	0.00	0.05	0.08	0.00	0.09	0.13	0.04	0.17	0.19	0.12
NOL	0.60	0.49	1.00	0.74	0.44	1.00	0.85	0.35	1.00	0.93	0.26	1.00
NOL2	0.25	0.43	0.00	0.50	0.50	1.00	0.69	0.46	1.00	0.84	0.37	1.00
LNAT	7.10	1.87	7.08	6.16	1.83	6.12	5.34	1.81	5.26	4.83	1.77	4.81
DLTT	0.27	0.23	0.25	0.25	0.25	0.20	0.23	0.30	0.08	0.18	0.27	0.04
XAD	0.01	0.03	0.00	0.01	0.03	0.00	0.01	0.04	0.00	0.01	0.04	0.00
MAG	0.75	0.43	1.00	0.44	0.50	0.00	0.19	0.39	0.00	0.03	0.17	0.00

Notes: This table presents the sample selection and descriptive statistics by *PCTLosses* for our subsample of loss-firm years. Variables are defined in Appendix A.

TABLE 4

Descriptive Statistics by MAG

	***MAG* = 0 N = 10,232**			***MAG* = 1 N = 4,654**		
Variable	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
TXT	0.00	0.03	0.00	-0.01	0.03	0.00
PI	-0.25	0.32	-0.13	-0.07	0.10	-0.04
HAVENYEAR	0.52	0.50	1.00	0.59	0.49	1.00
XRD	0.11	0.15	0.04	0.04	0.07	0.00
NOL	0.94	0.24	1.00	0.60	0.49	1.00
NOL2	0.84	0.37	1.00	0.21	0.41	0.00
LNAT	5.39	1.96	5.31	6.50	1.87	6.48
DLTT	0.23	0.28	0.11	0.22	0.22	0.19
XAD	0.01	0.03	0.00	0.01	0.03	0.00
PCTLosses	0.62	0.23	0.64	0.33	0.19	0.30

Notes: This table presents descriptive statistics for our subsample of loss-firm years by *MAG*. Variables are defined in Appendix A.

TABLE 5

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Loss Sample Loss Years

		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0036***	-0.0061***	-0.0032***	0.0012***
		(-5.60)	(-10.34)	(-4.63)	(4.31)
PI	+	0.2396***	0.0102	-0.0067***	0.0009**
		(17.06)	(1.07)	(-3.76)	(2.34)
*PI*HAVENYEAR*	−	-0.0544***	-0.0016	0.0005	0.0004**
		(-3.96)	(-0.49)	(0.52)	(2.08)
*PI*XRD*	−	-0.5953***	0.008	0.0040*	0.0004
		(-10.00)	(0.62)	(1.78)	(1.30)
*PI*NOL*	−	-0.1215***	-0.0029	0.0058***	-0.0001
		(-6.89)	(-0.31)	(3.58)	(-0.32)
*PI*NO2*	−	-0.1014***	-0.0029	0.0008	-0.0001
		(-8.06)	(-0.80)	(0.71)	(-0.48)
*PI*LNAT*	−	0.0042	0.0004	-0.0003*	0.0001**
		(0.84)	(0.65)	(-1.92)	(1.98)
*PI*DLTT*	−	-0.0912***	0.0092	0.0021*	-0.0001
		(-5.09)	(1.64)	(1.76)	(-0.23)
*PI*XAD*	+	-0.6987***	-0.0817**	0.0059	-0.0027
		(-8.52)	(-2.52)	-0.28	(-0.74)
N Obs.		2,829	4,837	5,762	5,156
N Obs. with non-zero weight		2,577	4,229	4,824	4,045
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for loss firm-years using Equation (2b). The columns report estimates for subsamples of firms grouped by the frequency of losses, measured as the percentage of firm-year observations with losses over the sample period. *TXT* is the total tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.

TABLE 6

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Loss Sample Loss Years

		MAG = 0	*MAG* = 1
		(1)	(2)
Dependent variable	Pred	*TXT*	*TXT*
INTERCEPT	?	-0.0020***	-0.0046***
		(-2.69)	(-10.43)
PI	+	-0.0027	0.2565***
		(-1.30)	(14.98)
*PI*HAVENYEAR*	–	0.0011***	-0.0435**
		(3.14)	(-2.17)
*PI*XRD*	–	0.0016**	-0.2497***
		(2.57)	(-2.98)
*PI*NOL*	–	0.0025	-0.0472**
		(1.28)	(-2.23)
*PI*NO2*	–	0.0009	-0.1720***
		(1.20)	(-6.49)
*PI*LNAT*	–	(0.00)	-0.0115**
		(-0.65)	(-2.43)
*PI*DLTT*	–	0.0003	0.0514*
		(0.59)	(1.77)
*PI*XAD*	+	0.001	-0.3751***
		(0.13)	(-3.33)
N Obs.		10,232	4,654
N Obs. with non-zero weight		8,330	4,216
Clustered SE		Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for loss firm-years using Equation (2b). Column 1 reports the results when MAG = 0, representing firm-years less likely to be able to utilize current-year losses. Column 2 reports results when MAG = 1, representing firm-years that are more likely to be able to utilize current-year losses. *TXT* is the total tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.

TABLE 7

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Loss Sample Loss Years

Panel A: *MAG*=0		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0112**	-0.0048*	-0.0028*	0.0012
		(-2.46)	(-1.88)	(-1.65)	-1.26
PI	+	-0.015	0.0103	-0.0049	0.0019**
		(-0.20)	(0.36)	(-1.12)	(2.31)
*PI*HAVENYEAR*	–	0.0125	-0.0021	0.0008	0.0004**
		-0.1	(-0.52)	-0.9	-2.03
*PI*XRD*	–	0.1697	0.0182	-0.0004	0.0003
		-0.24	(1.22)	(-0.17)	(0.86)
*PI*NOL*	–	0.012	-0.0028	0.0064*	-0.0004
		-0.21	(-0.09)	-1.72	(-0.54)
*PI*NO2*	–	0.0149	-0.0036	-0.0003	-0.0006
		(0.12)	(-0.52)	(-0.19)	(-1.43)
*PI*LNAT*	–	0.0053	-0.0004	-0.0001	0.0001**
		(0.17)	(-0.58)	(-0.41)	(2.48)
*PI*DLTT*	–	0.0477	0.0053	0.0022*	-0.0001
		-1.46	-1.05	-1.66	(-0.38)
*PI*XAD*	+	-0.2534	-0.0595*	0.0077	-0.0001
		(-0.38)	(-1.73)	-0.28	(-0.04)
N Obs.		609	2,357	3,673	3,593
N Obs. with non-zero weight		543	1,999	3,036	2,819
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table is continued on the next page.

TABLE 7 CONT.

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Loss Sample Loss Years

Panel B: *MAG*=1		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0042***	-0.0054***	-0.0046***	-0.0055*
		(-5.50)	(-7.96)	(-3.93)	(-1.98)
PI	+	0.3053***	0.2593***	0.2128***	0.0402
		(17.77)	(11.84)	(5.62)	(0.23)
*PI*HAVENYEAR*	–	-0.0966***	-0.0542	-0.0012	0.0152
		(-5.49)	(-1.50)	(-0.03)	-0.19
*PI*XRD*	–	-0.2179**	-0.0341	-0.7970***	-0.2619***
		(-2.03)	(-0.13)	(-3.20)	(-2.88)
*PI*NOL*	–	-0.0920***	0.0016	-0.1338***	-0.0426
		(-5.25)	-0.06	(-4.05)	(-0.47)
*PI*NO2*	–	-0.0102	-0.1971***	-0.1022***	0.0799
		(-0.19)	(-4.53)	(-2.59)	(1.13)
*PI*LNAT*	–	0.0057	-0.0052	-0.0049	0.0226
		(1.02)	(-1.11)	(-0.48)	(1.00)
*PI*DLTT*	–	-0.0439	0.0359	-0.0499	-0.1255
		(-0.86)	-0.81	(-1.51)	(-0.58)
*PI*XAD*	+	-1.2128***	-0.4582***	-0.9959**	-1.9536***
		(-7.81)	(-3.72)	(-2.53)	(-2.75)
N Obs.		1,870	1,818	855	111
N Obs. with non-zero weight		1,726	1,627	770	98
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for loss firm-years using Equation (2b). Panel A reports the results when *MAG* = 0, representing firm-years less likely to be able to utilize current-year losses. Panel B reports results when *MAG* = 1, representing firm-years that are more likely to be able to utilize current-year losses. The columns report estimates for subsamples of firms grouped by the frequency of losses, measured as the percentage of firm-year observations with losses over the sample period. *TXT* is the total tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.

TABLE 8

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Loss Sample Profit Years

		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0086***	-0.0074***	-0.0074***	-0.0040*
		(-19.28)	(-7.48)	(-7.83)	(-1.76)
PI	+	0.3622***	0.3552***	0.3726***	0.3548***
		(71.69)	(25.59)	-27.96	(19.94)
*PI*HAVENYEAR*	–	-0.0173***	-0.0091*	-0.0099	-0.0064
		(-3.92)	(-1.65)	(-0.96)	(-1.00)
*PI*XRD*	–	-0.2253**	-0.1997	-0.051	0.0127
		(-2.37)	(-1.06)	(-0.91)	(0.75)
*PI*NOL*	–	-0.0143***	-0.0192***	-0.0258	-0.3298***
		(-2.62)	(-3.06)	(-1.59)	(-12.65)
*PI*NO2*	–	-0.0216**	-0.0296**	-0.3215***	-0.018
		(-2.55)	(-2.29)	(-15.58)	(-0.90)
*PI*LNAT*	–	-0.0109***	-0.0058*	-0.0011	0.0025
		(-5.64)	(-1.96)	(-0.45)	(1.43)
*PI*DLTT*	–	-0.0167	-0.0449	0.019	-0.0021
		(-1.11)	(-0.62)	(0.26)	(-0.22)
*PI*XAD*	+	0.1702	0.1073**	0.0406	-0.0035
		(1.57)	(2.14)	(0.31)	(-0.02)
N Obs.		18,611	8,380	3,563	754
N Obs. with non-zero weight		17,316	7,422	3,081	608
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for profit firm-years using Equation (2a). The columns report estimates for subsamples of firms grouped by the frequency of losses, measured as the percentage of firm-year observations with losses over the sample period. *TXT* is the total tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.

TABLE 9

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits on Pretax Domestic and Foreign Income for Loss Sample Loss Years

		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0047***	-0.0066***	-0.0025***	0.0010***
		(-6.11)	(-9.03)	(-2.91)	(4.33)
PIDOM	+	0.2754***	0.0037	-0.0067***	0.0007**
		(15.61)	(0.44)	(-3.36)	(2.30)
PIFO	+	0.1110***	0.0017	0.0105	0.0028
		(3.18)	(0.09)	(0.88)	(1.61)
*PIDOM*HAVENYEAR*	−	-0.0615**	-0.0029	-0.0001	0.0003**
		(-2.44)	(-0.68)	(-0.15)	(2.27)
*PIFO*HAVENYEAR*	−	-0.1141***	-0.0104	-0.0044	-0.0006
		(-3.46)	(-0.65)	(-0.49)	(-0.66)
*PIDOM*XRD*	−	-0.1522**	0.0193	0.0039*	0.0001
		(-2.04)	(1.52)	(1.70)	(0.40)
*PIFO*XRD*	−	0.3676***	-0.0655	-0.0063	-0.0005
		(2.61)	(-1.03)	(-0.23)	(-0.68)
*PIDOM*NOL*	−	-0.0482**	-0.0011	0.0070***	-0.0003
		(-2.43)	(-0.12)	(4.12)	(-1.09)
*PIFO*NOL*	−	0.0027	0.0278*	0.0046	-0.0021*
		(0.10)	(1.65)	(0.51)	(-1.89)
*PIDOM*NOL2DOM*	−	-0.1853***	0.0017	-0.0013	0.0005***
		(-9.14)	(0.58)	(-1.09)	(2.79)
*PIFO*NOL2FOR*	−	-0.0585***	-0.0166	-0.0061	0.0004
		(-2.66)	(-1.21)	(-0.56)	(0.59)
*PIDOM*LNAT*	−	0.0026	0.0003	-0.0003	0.0001**
		(0.49)	(0.41)	(-1.53)	(2.14)
*PIFO*LNAT*	−	0.0051	0.0008	-0.0004	-0.0001
		(0.45)	(0.26)	(-0.16)	(-0.21)
*PIDOM*DLTT*	−	-0.0134	0.0088*	0.0030**	0.0001
		(-0.44)	(1.80)	(2.22)	(0.71)
*PIFO*DLTT*	−	0.1253**	0.0179	-0.0003	-0.0002
		(2.00)	(0.74)	(-0.02)	(-0.23)
*PIDOM*XAD*	+	0.1627	-0.0880*	0.0022	-0.0048
		(0.95)	(-1.88)	(0.12)	(-1.64)
*PIFO*XAD*	+	0.1344	-0.2725**	0.0899***	-0.0171
		(0.38)	(-2.37)	(2.80)	(-0.96)
N Obs.		2,252	3,805	4,484	4,298
N Obs. with non-zero weight		2,041	3,322	3,775	3,295
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for loss firm-years described in Equation (2b), with income separated into domestic and foreign components. *TXT* is the total accrued tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm and year. T-statistics are in brackets.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively, based on one-tailed tests when a direction is predicted. Variables are defined in Appendix A.

TABLE 10

Estimates of the Effect of Tax Havens on Total Worldwide Tax Benefits for Big Havens versus Dot Havens

		Percentage of firm-years with losses over sample period			
		>0% - <25%	25% - <50%	50% - <75%	75% - <100%
		(1)	(2)	(3)	(4)
Dependent variable	Pred	*TXT*	*TXT*	*TXT*	*TXT*
INTERCEPT	?	-0.0037***	-0.0050***	-0.0033***	0.0012***
		(-5.73)	(-8.62)	(-4.81)	(4.26)
PI	+	0.2378***	0.1674***	-0.0062***	0.0009**
		(10.80)	(8.13)	(-3.46)	(2.29)
*PI*Num_BigHaven*	–	-0.0341***	-0.0047	0.0013	0.0006
		(-2.72)	(-1.13)	(0.80)	(1.43)
*PI*Num_DotHaven*	–	0.0013	-0.0037	-0.0006	0.0000
		(0.10)	(-1.12)	(-0.56)	(0.18)
*PI*XRD*	–	-0.0374	0.0206**	0.0034	0.0003
		(-1.22)	(2.06)	(1.61)	(1.15)
*PI*NOL*	–	-0.1729***	-0.1548***	0.0054***	-0.0001
		(-7.12)	(-7.19)	(3.31)	(-0.23)
*PI*NO2*	–	-0.0444***	-0.0043	0.0008	-0.0001
		(-3.57)	(-1.39)	(0.68)	(-0.54)
*PI*LNAT*	–	0.0050*	0.0011	-0.0004***	0.0001
		(1.85)	(1.29)	(-2.59)	(1.21)
*PI*DLTT*	–	0.0259	0.0112**	0.0019	-0.0001
		(1.37)	(2.23)	(1.61)	(-0.30)
*PI*XAD*	+	-0.2618***	-0.0951***	0.0061	-0.002
		(-3.73)	(-3.06)	(0.30)	(-0.53)
N Obs.		2,829	4,837	5,762	5,156
N Obs. with non-zero weight		2,562	4,251	4,808	4,404
Clustered SE		Firm	Firm	Firm	Firm

Notes: This table presents tests examining the worldwide tax outcomes for loss firm-years using Equation (2b) distinguishing between "Big" haven presence versus dot haven presence. The columns report estimates for subsamples of firms grouped by the frequency of losses, measured as the percentage of firm-year observations with losses over the sample period. *TXT* is the total tax benefit. Continuous variables are winsorized at 1% and 99% and standard errors are clustered by firm. T-statistics are in brackets. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence levels, respectively. Variables are defined in Appendix A.