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## “Just BEAT it” do firms reclassify costs to avoid the base erosion and anti-abuse tax (BEAT) of the TCJA? <sup>☆</sup>

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## ARTICLE INFO

## JEL classification:

H26

F23

G30

G14

## Keywords:

Tax reform

International tax

Tax reserves

Internal information quality

TCJA

BEAT

## ABSTRACT

This study empirically examines whether firms reclassify related-party payments to avoid the base erosion and anti-abuse tax (BEAT) of the Tax Cuts and Jobs Act (TCJA). We leverage the BEAT filing threshold and use both a difference-in-differences design among U.S. firms and a triple-difference design utilizing the parent company's location to provide evidence that firms reclassify related-party payments to avoid the BEAT. This effect is stronger in firms with greater pre-TCJA income shifting incentives. We estimate a \$6 billion aggregate reduction in U.S. taxes for our sample firms in 2018. We also examine the consequences of reclassifying related-party payments and find some evidence of an increase in tax reserves and a reduction in internal information quality for firms that engage in cost reclassification to avoid the BEAT. These findings help explain observed BEAT collection shortfalls, contribute to the current policy debate about international tax reform, and document spillover effects of tax policy.

### 1. Introduction

Regulators argue that the current U.S. international tax system allows U.S. multinational corporations (MNCs) to avoid paying taxes ([Build Back Better Act, 2021](#); [Inflation Reduction Act of 2022, 2022](#); [U.S. Department of the Treasury, 2021, 2022](#)). One specific tax referenced as ineffective is the base erosion and anti-abuse tax (BEAT). The U.S. Department of the Treasury notes that BEAT tax collections are less than half of the original projections, consistent with firms avoiding the tax ([U.S. Department of the Treasury, 2021](#)). Early criticism of the BEAT posed that excluding cost of goods sold (COGS) from the BEAT “[...] leaves open significant gaming opportunities, ensuring that a good deal of base shifting will escape the regime” ([Kamin et al., 2018](#), p. 1508), which undermines the U.

<sup>☆</sup> We appreciate helpful comments from Ed deHaan (editor), an anonymous reviewer, Harald Amberger (discussant), T.J. Atwood, Brayden Bulloch, Michael Donohoe, Andy Duxbury, David Godsell, Robert Hills (discussant), Michelle Hutchens, Hansol Jang (discussant), Michael Mayberry, Paul Nysten, Ben Osswald, Anh Persson, Scott Rane, Ryan Sommerfeldt, Aruhn Venkat (discussant), Mary Vernon, Dan Wangerin, and participants at Peking University, the 10th EIASM Conference on Current Research in Taxation, the 2020 Dairyland Accounting Research Symposium, the WU Vienna Tax Brown Bag, the European Accounting Symposium for Young Scholars (EASYS), the University of Florida, the University of Illinois at Urbana-Champaign, the 2020 NTA Annual Meeting, the 2021 ATA Midyear Meeting, and the 2021 AAA Annual Meeting.

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<https://doi.org/10.1016/j.jacceco.2023.101648>

Received 8 August 2022; Received in revised form 24 October 2023; Accepted 25 October 2023

Available online 9 November 2023

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S. tax system (Bavis, 2019). Our study examines whether and to what extent MNCs reclassify costs to avoid the BEAT, providing evidence on the effectiveness of the BEAT and one potential explanation for the observed shortfall in BEAT collections.

The BEAT was enacted as part of the Tax Cuts and Jobs Act (TCJA), which fundamentally altered the U.S. corporate tax landscape with numerous changes to domestic and foreign tax provisions (Slemrod, 2018a). One of the TCJA's most significant changes for MNCs is shifting from a worldwide to a territorial tax system (Albertus et al., 2022). This change makes shifting income abroad more attractive because the tax savings are permanent compared to merely having been deferred under the previous worldwide tax regime (Dharmapala, 2018). To combat increases in income shifting incentives associated with the territorial tax system, the TCJA includes the BEAT (IRC § 59A, 2017). The BEAT imposes a minimum tax on a modified taxable income base that adds back certain deductions for "base erosion payments" to foreign parties (IRC § 59A, 2017), which effectively treats these payments as taxable income. Importantly, IRC § 59A only requires taxpayers to add back related-party payments treated as *deductions*. Payments classified as COGS are considered a *reduction in income* (Bavis, 2019; The Committee of Conference, 2017, p. 528). Therefore, the BEAT provision excludes COGS from the related-party add-back component, providing firms with an incentive to reclassify other related-party payments as COGS (Avi-Yonah, 2018; Bavis, 2019; Kamin et al., 2018; Kysar, 2018; PwC, 2018). Our study examines whether firms utilize this exclusion to reclassify costs to avoid the BEAT, providing timely and relevant evidence for tax policymakers.

Cost classification for tax purposes is subjective. The tax law defines COGS broadly as the direct and indirect cost of producing or acquiring inventory. PwC (2018) identifies sales-based royalties and management fees as two expenditures potentially includable in COGS. Still, many companies typically report these expenditures below the line in "other expenses". Reclassifying these expenditures from "below the line" to COGS (i.e., cost reclassification) reduces the BEAT. Initially, this may appear to be a low-cost tax planning strategy. However, discussions with a practitioner who directly advises clients on cost reclassification suggest there are potential internal and external costs to implementing this tax planning strategy.<sup>1</sup> We provide large-sample empirical evidence to inform policymakers and corporate stakeholders on whether and to what extent firms reclassify related-party payments to COGS to avoid the BEAT.

We investigate our research question with unconsolidated subsidiary-level sales data. While we argue firms reclassify related-party payments to COGS to avoid the BEAT, we cannot observe unconsolidated parent-level COGS. Therefore, we empirically examine the observable side of the reclassification transaction and test whether affected firms experience a relative increase in unconsolidated subsidiary-level sales following the enactment of the BEAT. When the MNC parent reports a related-party expense (e.g., a royalty payment to a foreign subsidiary) below the line, it shows up in the foreign subsidiary's financial statements as other income. The parent's reclassification of a below-the-line expense to COGS shifts this payment from other income to the subsidiary's top-line revenue, which increases the foreign subsidiary's unconsolidated sales (see Fig. 1). Therefore, we predict firms subject to the BEAT report higher unconsolidated foreign subsidiary-level sales following the enactment of the BEAT if parents reclassify related-party expenditures as COGS.<sup>2</sup> Critically, this cost reclassification does not mitigate the effects of other TCJA provisions, such as the tax rate reduction, the Global Intangible Low-Taxed Income tax (GILTI), or the interest deduction limitation, so we can attribute the behavioral response to the BEAT and not to other TCJA tax provisions.<sup>3</sup>

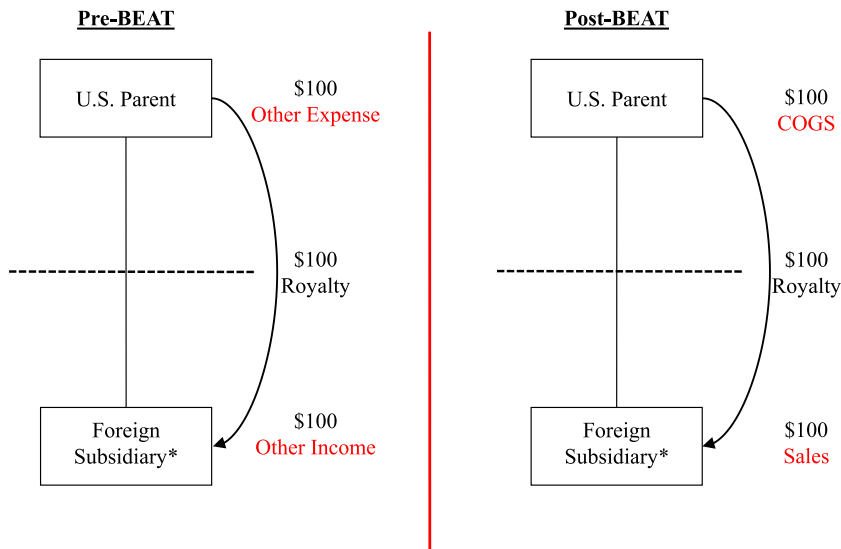
To test our predictions, we use unconsolidated data of MNCs' subsidiaries from Bureau van Dijk's Orbis database from 2011 to 2018. The BEAT applies to U.S. corporations with average gross receipts over the prior three years exceeding \$500 million. Therefore, we assume that U.S.-parented MNCs with average gross receipts over this threshold in 2017 are subject to the BEAT (BEAT firms). We begin our analyses with a standard difference-in-differences design that examines the relative differences between foreign subsidiary-level sales of U.S. BEAT firms above the gross receipts threshold (treatment firms) and U.S. firms below the gross receipts threshold (control firms) before and after the BEAT implementation. To address concerns that our treatment variable is a function of firm size and sales growth may differ for smaller and larger firms in the pre and post period regardless of the BEAT, we expand our analysis to include subsidiaries of MNCs from the non-U.S. G7 countries as an additional control group of large firms, yielding a triple-difference design. We include parent fixed effects and subsidiary country-industry-year fixed effects to control for parent level time-invariant characteristics and subsidiary level time-variant country-industry characteristics. We illustrate our empirical approach in Fig. 2.

Our triple-difference research design with non-U.S. parents and strict fixed effects has several advantages. First, it helps mitigate firm size selection issues related to whether firms are subject to the BEAT because U.S. MNCs above the \$500 million gross receipts threshold are treatment firms, while non-U.S. MNCs with more than \$500 million in gross receipts are control firms. Second, the research design helps rule out alternative explanations by comparing treated and untreated subsidiaries within the same country, industry, and year. Therefore, we control for time-dependent tax, industry, and macroeconomic effects on sales growth in a between-firm setting. Third, while the TCJA included numerous other changes, our approach controls for other TCJA tax law changes because both treatment and control firms are subject to these changes.

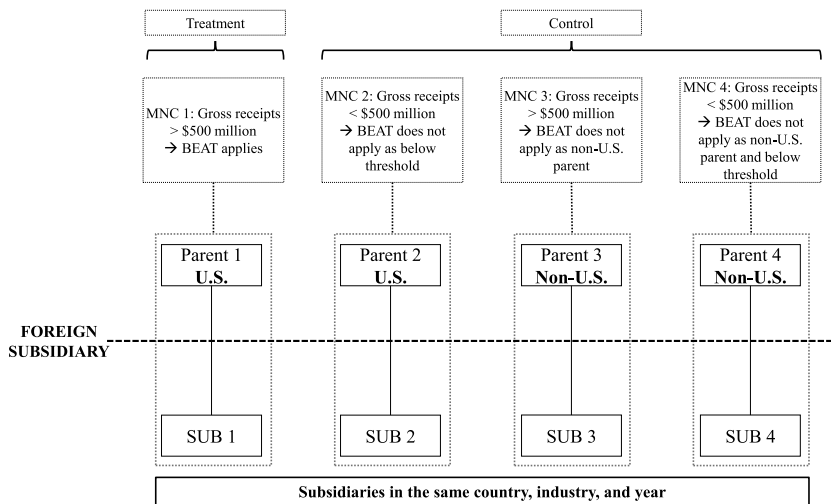
<sup>1</sup> We talked to an international tax partner who directly advises clients on whether and how to implement cost reclassification. The partner discussed how the proposed reclassification of costs involved meetings with operational staff, internal accounting staff, and the external financial statement auditor to decide whether these internal and external costs outweighed the tax savings generated by this strategy.

<sup>2</sup> Given the shift of the related-party payment from the subsidiary's other income to revenue, another prediction would be a decrease in other income. However, different reporting requirements across countries and missing data in countries where it is usually reported, results in approximately 56% of the sample lacking the other income variable. Given the missing observations are not randomly distributed, we do not examine other income as a dependent variable.

<sup>3</sup> Reclassifying intercompany payments to COGS does not affect the profitability of the subsidiary or parent company. Furthermore, as most other provisions of the TCJA are based on taxable income, they do not motivate cost reclassification. We also provide empirical evidence in Section 4.3 that firms affected by the BEAT do not exhibit growth in profitability.



**Fig. 1. Related-party payments pre- and post-BEAT.** This figure illustrates the predicted effects of a related-party payment (e.g., a royalty) on the U.S. parent and its foreign subsidiary before and after the BEAT enactment, respectively. We predict that U.S. firms have an incentive to reclassify related-party payments as cost of goods sold (COGS) after the enactment of the BEAT. \* denotes the availability of unconsolidated financial statement data. We use foreign subsidiaries’ data as there is no unconsolidated data available for U.S. parents.



**Fig. 2. Illustration of the empirical approach.** This figure illustrates our empirical approach. In the standard difference-in-differences design with the U.S.-only sample (Equation (1)), we compare unconsolidated sales of foreign subsidiaries of MNCs whose parents are subject to BEAT (SUB 1) versus those not subject to BEAT (SUB 2). In the triple-difference design with the full sample (Equation (2)), we add subsidiaries of non-U.S. MNCs above (SUB 3) and below (SUB 4) the BEAT threshold as control firms. By including subsidiary-level country-industry-year fixed effects, our estimates are based on a within country-industry-year estimation.

Our empirical analyses find an average decline in sales growth of foreign subsidiaries. However, after validating the parallel trends assumption in the pre-BEAT period, we find the decline in sales growth is weaker in the post-BEAT period in the foreign subsidiaries of BEAT firms, suggesting that firms reclassify COGS to avoid the BEAT. Using the triple-difference design, we find a 6.8 percentage point difference in foreign subsidiary-level sales growth in the post-BEAT period in BEAT firms relative to control firms; interpreted at the mean level of sales, this implies a \$6 billion reduction in U.S. taxes in aggregate for our sample of MNCs. In falsification tests, we examine the profitability of treatment versus control firms. If our results reflect the *reclassification* of existing related-party payments, these reclassifications will not affect subsidiaries’ profitability. Consistent with cost reclassification, we find no evidence of changes in the profitability of treatment firms’ foreign subsidiaries. Our findings are robust to using entropy balancing and a regression discontinuity analysis. They are also robust to including 2019 as an additional post-treatment year, but the largest treatment effects are observed in 2018 following the TCJA enactment. Overall, our results suggest that firms reclassify below the line related-party payments to COGS to avoid the BEAT.

We perform several cross-sectional analyses to strengthen the validity of our results. The BEAT disproportionately affects firms with higher income shifting incentives. While the statutory tax rate reduction from 35% to 21% diminished outbound income shifting incentives for some firms, incentives remain for firms with subsidiaries in low-tax countries (Clausing, 2020). In additional analyses, we predict that firms with greater income shifting incentives are most affected by the BEAT and are therefore more likely to reclassify costs. We identify several proxies for income shifting incentives, including low-tax jurisdiction subsidiaries, the proportion of foreign patents, the U.S. and foreign tax rate differential, and an estimate of outbound income shifting. We find results consistent with our prediction. These cross-sectional tests demonstrate that firms most adversely affected by the BEAT drive our results, allowing us to attribute our findings to the BEAT rather than other TCJA changes (Auerbach and Slemrod, 1997).

We next examine the consequences of cost reclassification to avoid the BEAT. We find some evidence that BEAT firms record higher tax reserves for uncertain tax positions. These tax reserve increases represent a financial reporting cost of cost reclassification. Additions to tax reserves can result in proprietary and political costs by highlighting potentially sensitive tax information (Desai and Dharmapala, 2009; Hanlon and Slemrod, 2009; Lisowsky et al., 2013). We also find that at the parent level, some evidence that BEAT firms experience delays in earnings announcements, lower management forecast accuracy, and a higher likelihood of internal control weaknesses, suggesting that cost reclassification potentially reduces internal information quality. Overall, these results are consistent with nonzero costs of cost reclassification. Our primary results suggest that, on average, these costs do not deter firms from engaging in cost reclassification. However, our results suggest that managers should consider these costs when evaluating the net benefits of this strategy.

This study makes several contributions. First, it provides relevant empirical evidence consistent with recent claims about the inefficiencies of the U.S. international tax system (Build Back Better Act, 2021; U.S. Department of the Treasury, 2022). Low corporate tax payments, including BEAT revenue shortfalls, have contributed to perceptions of taxpayer iniquity and led to new regulations targeting large MNCs in the recently enacted Inflation Reduction Act of 2022 (Inflation Reduction Act of 2022, 2022). Among other provisions, the Inflation Reduction Act created a new Book Minimum Tax to target large corporations with low tax payments despite sizeable book profits.<sup>4</sup> We also provide timely evidence supporting the proposed repeal of the COGS exception (Build Back Better Act, 2021) and informing the debate on repealing the BEAT altogether as reflected in the Biden Budget Proposal of 2024 (Tax Foundation, 2023). Bavis (2019) argues that the COGS exception undermines the U.S. territorial tax regime, violates the neutrality concept, and reduces the tax's ability to curtail aggressive income shifting. The Department of the Treasury highlighted the lack of BEAT tax collections relative to Congressional Budget Office estimates. Our study helps explain the shortfall in tax revenue from the BEAT (The Committee of Conference, 2017; U.S. Department of the Treasury, 2021).

Second, our findings add to the literature that examines corporate tax planning and the consequences of U.S. taxation of MNCs. Prior research examining corporate responses to tax law changes focuses on shifting income or expenses to take advantage of new tax rates (e.g., Gaertner et al., 2020; Guenther, 1994; Klassen et al., 1993; Lynch et al., 2023; Scholes et al., 1992). Most strategies that involve shifting or reclassifying income directly affect taxable income either through the timing of which year the income is reported or by changing the character of the income. We investigate a new tax rule's effect on MNCs' cost reclassification that decreases the firm's tax liability but does not affect taxable income. We also examine the cost reclassification behavior's consequences for a firm's internal and external information environment. Therefore, we extend this literature to provide evidence on the BEAT and its unintended consequences.

Third, our research contributes to a growing body of studies examining the TCJA's international tax provisions, answering calls from recent research to examine the TCJA's effect on firm behavior (Donohoe et al., 2019; Slemrod, 2018b). We are the first paper to our knowledge to examine the behavioral response to the BEAT using large-sample empirical analyses. Our findings suggest that firms use the BEAT's COGS exception and the inherent subjectivity in cost classification to reclassify costs to avoid the BEAT. Overall, we believe our results will interest policymakers, corporate stakeholders, and academics as they evaluate the consequences of the most extensive tax reform since 1986.

## 2. Prior literature and hypothesis development

The TCJA fundamentally changed how the U.S. taxes firms, with numerous changes to domestic and international provisions. Before the TCJA, the U.S. had one of the world's highest corporate tax rates, leading to significant incentives to shift income out of the U.S. and into lower-tax foreign jurisdictions (Klassen and Laplante, 2012). While the TCJA's decreased corporate tax rate reduced outbound income shifting incentives for some firms, many MNCs have subsidiaries in low or no-tax jurisdictions, suggesting tax benefits from shifting income out of the U.S. remain (Clausing, 2020). Furthermore, the change from a worldwide to a territorial tax system enhanced outbound income shifting incentives.<sup>5</sup> To combat the increased base erosion incentives created by the territorial tax

<sup>4</sup> The Congressional Research Service explains some reasons for continued large book profits and low tax payments, including exclusion of foreign profits and profit shifting (Congressional Research Service, 2022), suggesting that perceived inefficiencies of recently implemented tax laws designed to limit profit shifting such as BEAT helped motivate the new regulations.

<sup>5</sup> Under the previous worldwide tax system, MNCs were taxed on worldwide income and received tax credits for foreign taxes. Prior research suggests the worldwide system created investment inefficiencies due to its incentive to keep cash overseas (Amberger et al., 2021; Edwards et al., 2016; Graham et al., 2017; Hanlon et al., 2015). To reduce inefficiencies and allow firms to access foreign cash, the TCJA enacted a territorial tax system that primarily taxes U.S. sourced income. Relative to a worldwide regime, a territorial system increases incentives for outbound income shifting because the shifting results in permanent tax savings (Donohoe et al., 2019; Liu, 2020; Markle, 2016).

system, the TCJA also included new international provisions, including the BEAT. The BEAT imposes an additional tax on large corporations with significant related-party payments.<sup>6</sup> These base erosion payments are broadly defined to include any deductible amount made to a related foreign party (IRC § 59A, 2017). Importantly, COGS payments are excluded from the definition of base erosion payments.

Academics and regulators argue the BEAT is ineffective due to MNCs' abilities to tax plan to avoid the BEAT (Bavis, 2019; U.S. Department of the Treasury, 2021). The exclusion of COGS from the addback of related party payments in the BEAT incentivizes firms to reclassify related-party payments as COGS (Avi-Yonah, 2018). Appendix B illustrates a simplified BEAT calculation with parent and subsidiary financial data. This example shows how BEAT firms can reclassify below-the-line costs to COGS to reduce an MNC's BEAT liability. In Case #1, the parent makes royalty payments to its foreign subsidiary. The parent reclassifies those royalty payments as COGS in Case #2. Under both scenarios, beginning Pre-tax Income, Taxable Income, and the regular U.S. tax liability are identical. Reclassifying the royalty payment to COGS in Case #2 results in substantial cash tax savings. Case #2 also demonstrates that the reclassified COGS increases sales in the foreign subsidiary, the dependent variable used in this study.<sup>7</sup>

Tax law broadly defines COGS as the direct and indirect costs of producing or acquiring inventory. Royalties and management fees are examples of indirect costs. Taxpayers classify many of these costs as 'below the line' expenses rather than capitalizing them into product costs and deducting them as COGS, presumably because there is generally no tax difference between the two classifications.<sup>8</sup> Therefore, royalties and management fees are two types of related-party expenditures potentially includable in COGS that would reduce the BEAT liability (PwC, 2018).<sup>9</sup> Given reclassifying related-party payments into COGS can substantially reduce the BEAT liability, we expect firms to review their allocations and reclassify as many intercompany payments as possible into COGS from below-the-line deductions to save taxes. However, practitioners suggest there are potential external and internal costs of implementing this strategy.

External costs of cost reclassification include IRS audit risk, reputational risk, and financial statement risk. If cost reclassification attracts IRS attention, it could lead to higher IRS audit risk and larger tax adjustments. According to the IRS audit manual, discerning the costs to include in COGS is a common area of IRS scrutiny. Furthermore, based on discussions with practitioners, firms often need to file Form 3115 with the IRS to request a change in accounting method. Significant changes in how costs are accounted for can prompt IRS scrutiny. Thus, firms might not engage in cost reclassification because IRS audit risk is a deterrent to risky tax behavior (Graham et al., 2014; Hoopes et al., 2012). Reputation risk to cost reclassification also exists. Tax strategies involving profit shifting overseas are highly controversial and therefore are a target for media and political scrutiny. Strategies that help firms avoid the BEAT may help facilitate low tax payments despite large profits, which could cause the firm to become a political or media target and subject the firm to significant reputational damage. Graham et al. (2014) find survey evidence that reputational concerns deter firms from engaging in aggressive tax planning; therefore, risks of triggering reputational costs could deter cost reclassification. Financial statement risk is another external cost of reclassification. Firms materially affected by the BEAT may need to disclose this exposure in their financial statements. Prior research finds that tax authorities use public financial statement disclosures in their examinations (Bozanic et al., 2017). Furthermore, cost reclassification might require firms to recognize a tax reserve for this tax position in the financial statements, which decreases reported earnings. Increases in tax reserves on the financial statements also trigger reporting to the IRS on Schedule UTP, thereby potentially increasing IRS audit risk (Towery, 2017).

From an internal cost perspective, there are potential implementation and operational costs to reclassification. Cost reclassification requires a significant change in how transactions are recorded in the underlying internal accounting systems across all the firm's business units. The magnitude of the cost of updating these internal systems can be substantial and will vary based on many factors including the firm's size, complexity, and the current systems in place. Firms might need to change their internal accounting system because the IRS can be critical of firms reporting transactions differently for internal versus tax return purposes (Baldenius et al., 2004; Klassen et al., 2017). Furthermore, changing an internal accounting system company-wide can be costly because separate divisions within an MNC often maintain their own disaggregated accounting systems. It is costly to change disaggregated reporting systems because it requires changing multiple systems and integrating these changes with the parent company's financial reporting system. These changes to the internal accounting system that determine how intercompany costs are accounted for can decrease the quality of internal information.

Collectively, there are potentially significant external and internal costs of reclassifying expenditures. Despite these possible costs, we predict that, on average, there is an incentive for taxpayers subject to the BEAT to engage in cost reclassification. The imprecise nature of the specific costs included in COGS allows firms to reclassify costs, leading to a potentially substantial tax benefit. Therefore, we pose the following directional hypothesis:

<sup>6</sup> GILTI is another provision of the TCJA that helps to combat income shifting. GILTI taxes income in low-tax countries where firms lack substantial assets rather than targeting related-party payments.

<sup>7</sup> Practitioners confirmed that an intra-company expense reported as COGS at the parent-level is almost always captured as sales at the affiliate-level as these costs are capitalized into the cost of the product being sold. However, to the extent cost reclassification is captured in other line items of the affiliate's income statement, it biases against finding results when examining changes in subsidiary-level sales.

<sup>8</sup> Taxpayers can allocate capitalizable sales-based royalties entirely to property sold during the year (PwC, 2018). While these costs are technically "capitalized" into inventory, they do not increase ending inventory. Therefore, shifting below the line costs into COGS should not result in costs being included in financial statement ending inventory.

<sup>9</sup> The BEAT includes anti-abuse rules the IRS can use to re-categorize BEAT avoidance transactions, but many related-party payments are properly includable in COGS (PwC, 2018). Thus, it is unclear whether specific payments are reclassified as COGS solely to avoid the BEAT (Kamin et al., 2018; Kysar, 2018).

H: BEAT-affected foreign subsidiaries experience an increase in their unconsolidated sales relative to unaffected foreign subsidiaries after the introduction of the BEAT.

### 3. Research design and data

#### 3.1. Research design

To estimate the effect of the BEAT on subsidiary-level sales growth, we begin with a difference-in-differences analysis that compares the change in foreign subsidiaries' sales between U.S. MNCs above the BEAT threshold (treatment group, SUB 1 in Fig. 2) and U.S. MNCs below the BEAT threshold (control group, SUB 2) before and after the BEAT. This approach yields the following difference-in-differences design, which we estimate using OLS:

$$SalesGrowth\_Sub_{s,t} = \alpha_p + \alpha_{c,j,t} + \beta_1 BEAT_p \times Post_t + \sum \beta_k Controls\_Sub_{s,t}^k + \sum \beta_m Controls\_Parent_{p,t}^m + \varepsilon_{s,t}. \quad (1)$$

The subscripts  $c, j, s, p,$  and  $t$  indicate the country, industry, subsidiary, parent, and year, respectively. Our unit of observation is a subsidiary-year (subscript  $s,t$ ). The dependent variable,  $SalesGrowth\_Sub$ , equals unconsolidated subsidiary sales at time  $t$  less sales at time  $t-1$ , scaled by sales at time  $t-1$ .<sup>10</sup>  $SalesGrowth\_Sub$  captures the subsidiary's percentage change in unconsolidated sales.<sup>11</sup> We measure the dependent variable as a change variable because prior research suggests it can improve internal validity (Allison, 1990) and is the best way to capture incremental decisions in response to taxes (MacKie-Mason, 1990). The indicator variable  $BEAT$  equals one for MNCs' observations with three-year average annual revenues of \$500 million or more in 2017, making them subject to the BEAT provision.<sup>12</sup> The indicator variable  $POST$  is equal to one for MNCs' observations with a tax year after the enactment of the TCJA in 2017.<sup>13</sup> In Equation (1), the coefficient on the interaction term ( $BEAT \times POST$ ),  $\beta_1$ , is the difference-in-differences estimator, which estimates the differential effect of the BEAT provision on U.S.-parented BEAT subsidiaries relative to U.S.-parented non-BEAT subsidiaries after the TCJA. We predict a positive coefficient on  $\beta_1$ , consistent with higher foreign subsidiary sales growth for U.S. BEAT firms after the TCJA in 2017 (treatment firms) relative to U.S. firms not affected by BEAT (control firms).

To address the concern that the primary treatment variable in the U.S. sample is based on firm size, which could lead to other differences between firms that could influence our estimates, and because sales growth may differ for smaller and larger firms in the pre and post period regardless of the BEAT, we extend Equation (1) to a triple-difference specification. Fig. 2 illustrates this approach. In the triple-difference design, our control firms include two groups below the BEAT threshold, U.S. MNCs (SUB 2 in Fig. 2) and non-U.S. MNCs (SUB 4), as well as non-U.S. MNCs above the BEAT threshold (SUB 3). We add the indicator variable  $US$ , which is equal to one for MNCs' observations with a U.S. parent, to Equation (1) and interact it with  $BEAT$  and  $POST$ , leading to the following triple-difference specification we estimate using OLS:

$$SalesGrowth\_Sub_{s,t} = \alpha_p + \alpha_{c,j,t} + \beta_1 US_p \times BEAT_p \times Post_t + \beta_2 US_p \times Post_t + \beta_3 BEAT_p \times Post_t + \sum \beta_k Controls\_Sub_{s,t}^k + \sum \beta_m Controls\_Parent_{p,t}^m + \varepsilon_{s,t}. \quad (2)$$

All other variables are identical to Equation (1) and are defined previously, and the coefficient on the triple interaction ( $US \times BEAT \times POST$ ),  $\beta_1$ , is our coefficient of interest. We predict  $\beta_1$  to be positive, indicating higher foreign subsidiary sales growth for U.S. BEAT firms after the TCJA in 2017 (treatment firms) relative to firms not affected by the BEAT (control firms).<sup>14</sup>

Both Equation (1) and Equation (2) include parent fixed effects ( $\alpha_p$ ) and subsidiary country-industry-year fixed effects ( $\alpha_{c,j,t}$ ) to absorb time-invariant characteristics at the parent level and time-variant country-industry characteristics at the subsidiary level. The

<sup>10</sup> We retrieve the variable "Sales" (Orbis code: *TURN*) from Bureau van Dijk's Orbis database. For some countries in our sample (Australia, Ireland, Russia, and the U.K.), Orbis does not provide the variable "Sales" because it does not exist in the local data source (Bureau van Dijk, 2011). To avoid a significant reduction in observations, we use the variable "Operating Revenue" (Orbis code: *OPRE*) for these countries. Our results remain unchanged if we drop observations from these countries.

<sup>11</sup> We use book numbers in all analyses. Book and tax numbers can differ due to differences in how revenue and expenses are recognized for book versus tax purposes. However, U.S. tax laws require accounting for both the parent's expense and affiliate's revenue sides of intercompany payments in the same period. Therefore, there should not be significant book-tax differences related to these intercompany payments.

<sup>12</sup> We measure the threshold in 2017, the year before the BEAT is implemented. Treasury regulations specify a firm is subject to the BEAT if aggregate revenues of the U.S. incorporated firm and greater than 50% owned entities are over \$500 million. GAAP financial statements require similar consolidation rules. Therefore, we use the MNCs' consolidated "Operating Revenue" (Orbis code: *OPRE*) to approximate aggregate taxable gross receipts of the group, which are unobservable in publicly available data. We also validate our treatment measure of BEAT exposure using the SEC EDGAR database to search SEC 10-K filings for the phrase "base erosion" within the U.S. sample in the 2017 or 2018 fiscal year filing. We found approximately 38% of subsidiary years in our sample where we can retrieve SEC filings from EDGAR belong to a U.S. parent that discusses this term. Of the 38%, approximately 97% of these firms are treatment firms ( $BEAT = 1$ ).

<sup>13</sup> The BEAT was enacted for all firms with a tax year beginning after 12/31/2017. We designate firms with an estimated tax year beginning after 12/31/2017 as  $POST = 1$ . If a firm's fiscal year end is, for example, 1/31/2018, then the beginning of the tax year is 2/1/2017 and  $POST$  is set to zero. Results are robust to dropping firms without a December 31st year-end (untabulated).

<sup>14</sup> Non-U.S. corporations reporting more than \$500 million in U.S. revenues are subject to the BEAT. Due to data limitations, we cannot identify these firms, so we assume MNCs with foreign parents are not subject to the BEAT. Thus, some foreign-parented firms subject to the BEAT are in our control sample, which we believe biases against finding a result.

country-industry-year fixed effects control for tax system characteristics, country-industry differences, and changes over time that could influence sales growth. They also control for country-industry-specific macroeconomic conditions.<sup>15</sup> Moreover, the vectors *Controls\_Sub* and *Controls\_Parent* control for various subsidiary-level and parent-level time-varying characteristics that could affect the incentives and ability to engage in cost reclassification. Specifically, we include *Tangibility* (the share of fixed assets at time  $t$  relative to lagged total assets ( $t-1$ )), which could affect the size of the COGS account. We also include *Size* (the logarithm of total assets at time  $t$ ), *RoA* at time  $t$  (return on lagged assets ( $t-1$ )), and *CashRatio* (share of cash holdings at time  $t$  relative to lagged total assets ( $t-1$ )), to control for firm resources. Appendix A provides definitions of all variables.

We recognize that each group (SUB 1, SUB 2, SUB 3, and SUB 4 in Fig. 2) is subject to measurement issues. We enumerate these issues here. First, we include all U.S. MNCs with three-year average annual revenues of \$500 million or more in 2017 as treatment firms (SUB 1) because we cannot measure total base erosion payments. Total base erosion payments must exceed three percent of all deductions for the BEAT to apply. Therefore, some treatment firms are not subject to the BEAT, which biases against finding results.<sup>16</sup> Second, we include all firms with three-year average annual revenues of \$500 million or less in 2017 as control firms (SUB 2 and SUB 4). These firms are smaller than our treatment firms. We include controls for size to help alleviate this concern. We also conduct sensitivity tests dropping larger treatment firms and smaller control firms to ensure that treatment and control firms are of comparable size.

### 3.2. Data and descriptive statistics

We collect unconsolidated financial data of MNCs' subsidiaries from Bureau van Dijk's Orbis database from 2011 to 2018.<sup>17</sup> An MNC consists of one parent firm and at least one foreign subsidiary (e.g., Parent 1 and SUB 1 in Fig. 2). We require the parent of the MNC to be a resident in the U.S. or one of the other six G7 countries.<sup>18</sup> We exclude financial (NACE 6400 to 6899) and utility (NACE 3500 to 3999) subsidiaries because both fall under specific regulations. We drop observations with missing values for our dependent or independent variables. We also drop observations with values of our dependent variable, *SalesGrowth\_Sub*, outside of the one and 99 percentiles, because unreasonably high outliers at the tails of the distribution in the Orbis data can influence the results (Becker et al., 2013). Finally, we require observations directly before and after the enactment of the TCJA in 2017 and 2018 and drop single country-industry-year observations due to insufficient variation for our strict fixed effects approach. We also winsorize continuous variables at the first and 99th percentiles of their respective distribution. Our final sample consists of 158,964 subsidiary-year observations (24,982 unique subsidiaries) incorporated in 48 countries. Table 1 summarizes our sample selection (Panel A) and presents subsidiary-year observations by subsidiary country (Panel B).<sup>19</sup>

Table 2 provides descriptive statistics for our sample firms. In the full sample (Panel A), the average sales growth equals 10.2%. Panel B (Panel C) shows that 67,706 (91,258) of the total 158,964 observations have a U.S. parent (non-U.S. parent). From a statistical standpoint, these two sets of subsidiaries differ along most variables (except *SalesGrowth\_Sub*), highlighting the need to control for subsidiary characteristics. As evident in Panel D, our sample includes 2963 unique parents with an average of 8.43 foreign subsidiaries.

## 4. Main results

### 4.1. Primary regression results

We present the results for the standard difference-in-differences test (Equation (1)) in Table 3. For this test, the sample only includes subsidiaries of U.S. MNCs. We estimate Equation (1) without (with) control variables in Column 1 (Column 2) to show the incremental effect of adding control variables. These two specifications help ensure that our control variables are not inducing bias in our coefficient of interest (Whited et al., 2022). The estimate of our coefficient of interest ( $BEAT \times POST$ ),  $\beta_1$ , is positive and statistically significant in both columns.<sup>20</sup> The coefficient in Column 2, 0.076, implies a 7.6 percentage point increase in *SalesGrowth\_Sub* in the post-TCJA period for foreign subsidiaries of U.S. MNCs subject to the BEAT relative to foreign subsidiaries of U.S. MNCs not affected by

<sup>15</sup> We exclude the main effects of *POST*, *BEAT*, and *US* in Equations (1) and (2) because the coefficients are absorbed by the fixed effects.

<sup>16</sup> Related-party payments are a primary way to shift income. Therefore, we use proxies for income shifting incentives to approximate related-party base erosion payments. We predict and find a stronger effect for MNCs with higher income shifting incentives, which are likely highly correlated with total base erosion payments (see Section 5.1).

<sup>17</sup> Financial statement consolidation rules eliminate related-party transactions, which precludes the use of parent-level consolidated financial statement COGS to investigate our research question. Our analysis focuses on subsidiary-level sales as the primary dependent variable because unconsolidated parent-level financial statements for U.S. MNCs are not available to assess parents' unconsolidated COGS. Moreover, we do not examine intercompany eliminations in the Compustat segment file because only approximately 3% of firm-years with available segment data report non-missing or nonzero segment eliminations, suggesting the data may be unreliable.

<sup>18</sup> We restrict our sample to the G7 countries, including Canada, France, Germany, Italy, Japan, the U.K., and the U.S. These countries' economies are relatively similar, and MNCs from these countries have similar foreign investment incentives. This research design choice helps rule out the alternative explanation that differing economic conditions across countries drive our results.

<sup>19</sup> Subsidiaries of MNCs are typically not publicly listed and therefore not required to file financial statements in the U.S. Therefore, U.S. subsidiaries are not present in our sample (or in any Orbis sample).

<sup>20</sup> While our hypothesis is directional, we present two-tailed significance tests because we cannot completely rule out a potential effect in the opposite direction.

**Table 1**  
Sample selection and sample composition.

Panel A: Sample Selection					
Sample selection					Observations (subsidiary-years)
Subsidiary-years (unconsolidated accounts) of parents from a G7 country after dropping subsidiaries operating in the financial (NAACE 6400 to 6899) and utility (NAACE 3500 to 3999) sector					378,313
Obs. with missing values for subsidiary and parent-level main variables ( <i>SalesGrowth_Sub</i> , <i>CashRatio</i> , <i>RoA</i> , <i>Size</i> , and <i>Tangibility</i> )					(183,622)
Observations with values for <i>SalesGrowth_Sub</i> in the bottom or top one percent of the variable distribution					(3892)
Subsidiaries with missing 2017 or 2018 subsidiary-year					(28,166)
Observations w/o sufficient observations for the country-industry-year fixed effects (i.e., single obs. within a country-industry-year)					(3669)
<b>Final sample</b>					<b>158,964</b>
Panel B: Subsidiary composition by country					
Name of country	N	Share (%)	Name of country	N	Share (%)
Australia	5575	3.51	Lithuania	249	0.16
Austria	2397	1.51	Luxembourg <sup>a</sup>	249	0.16
Belgium	8334	5.24	Macedonia	42	0.03
Bosnia and Herzegovina	106	0.07	Malta <sup>a</sup>	14	0.01
Brazil	458	0.29	Mexico	26	0.02
Bulgaria	1315	0.83	Montenegro	12	0.01
China	6273	3.95	Morocco	170	0.11
Croatia	799	0.50	Netherlands <sup>a</sup>	1296	0.82
Czech Republic	4558	2.87	New Zealand	852	0.54
Denmark	754	0.47	Norway	3237	2.04
Estonia	694	0.44	Poland	6390	4.02
Finland	1926	1.21	Portugal	3229	2.03
France	14,048	8.84	Romania	3638	2.29
Germany	6514	4.10	Russian Federation	5192	3.27
Greece	1493	0.94	Serbia	661	0.42
Hungary	3055	1.92	Singapore <sup>a</sup>	3573	2.25
Iceland	34	0.02	Slovakia	2375	1.49
India	5048	3.18	Slovenia	705	0.44
Ireland <sup>a</sup>	2786	1.75	Spain	11,752	7.39
Italy	14,174	8.92	Sweden	6477	4.07
Japan	283	0.18	Taiwan	75	0.05
Kazakhstan	39	0.02	Thailand	123	0.08
Korea	5249	3.30	Ukraine	766	0.48
Latvia	646	0.41	United Kingdom	21,303	13.40
			<b>Total</b>	<b>158,964</b>	<b>100%</b>

This table presents the sample selection (Panel A) and the number and share of observations (subsidiary-years) in each of the 48 subsidiary countries (Panel B).

<sup>a</sup> Indicates a tax planning jurisdiction.

the BEAT. We repeat the test from Column 2 with truncated samples in Columns 3 and 4. In Column 3 (Column 4) we drop large (large and small) parents, specifically excluding subsidiaries of MNCs with consolidated revenues above the sample median (above the sample median and below \$10 million). We continue to find significant coefficient estimates for  $\beta_1$ . Therefore, the effect is still present when we limit our treatment and control firms to those closer to the BEAT threshold of \$500 million in operating revenues.<sup>21</sup>

We begin our triple-difference analysis with a univariate triple-difference test, comparing the mean values for *SalesGrowth\_Sub* between firms above versus below the BEAT threshold and across the pre- and post-treatment periods. We present means for both subsidiaries of U.S. MNCs (top line in each cell) and subsidiaries of non-U.S. MNCs (bottom line of each cell) in Table 4. The triple-difference test leverages multiple differences between treatment and control firms. To illustrate, we denote D1 as the difference in sales growth between subsidiaries of U.S. firms above the threshold before and after the BEAT (−0.061). D2 is the difference between subsidiaries of U.S. firms below the BEAT threshold before and after the BEAT (−0.087); D3 is the difference between subsidiaries of non-U.S. firms above the threshold before and after the BEAT (−0.076); D4 is the difference between subsidiaries of non-U.S. firms below the BEAT threshold before and after the BEAT (−0.076). D1 is the treatment group. We subtract D2 from D1 and then subtract the difference between D3 and D4, so the triple differences estimate is defined as [D1 − D2] − [D3 − D4]. Thus, the triple-difference is 0.026 (= [−0.061 − (−0.087)] − [−0.076 − (−0.076)]). This estimate is statistically significant and provides univariate evidence of firms reclassifying costs to avoid the BEAT.

Table 5 presents the results from estimating Equation (2). This test includes the full sample of subsidiaries, including those of non-U.S. MNCs. Following our approach in Table 3, we first estimate Equation (2) without control variables (Column 1 of Table 5) and then

<sup>21</sup> The minimum parent-level revenues in our sample are \$1.6 million. We find consistent results when we drop parents with revenues below \$25 million, \$50 million, and \$100 million (untabulated).



**Table 2**  
Descriptive statistics.

Variables	N	Mean	S.D.	Q1	Median	Q3
<b>Panel A: Full sample</b>						
<i>SalesGrowth_Sub</i>	158,964	0.102	0.481	-0.095	0.021	0.172
<i>BEAT</i>	158,964	0.915	0.279	1.000	1.000	1.000
<i>POST</i>	158,964	0.142	0.349	0.000	0.000	0.000
<i>Tangibility_Sub</i>	158,964	0.255	0.274	0.035	0.153	0.403
<i>Size_Sub</i>	158,964	9.719	1.980	8.380	9.731	11.058
<i>RoA_Sub</i>	158,964	0.090	0.191	0.012	0.068	0.156
<i>Cash Ratio_Sub</i>	158,964	0.176	0.232	0.016	0.079	0.246
<i>Tangibility_Parent</i>	158,964	0.607	0.240	0.460	0.585	0.722
<i>Size_Parent</i>	158,964	15.978	1.951	14.816	16.071	17.474
<i>RoA_Parent</i>	158,964	0.071	0.070	0.035	0.063	0.103
<i>Cash Ratio_Parent</i>	158,964	0.128	0.115	0.056	0.095	0.160
<b>Panel B: Sample of U.S. MNCs</b>						
<i>SalesGrowth_Sub</i>	67,706	0.099	0.472	-0.094	0.021	0.168
<i>BEAT</i>	67,706	0.954	0.210	1.000	1.000	1.000
<i>POST</i>	67,706	0.134	0.341	0.000	0.000	0.000
<i>Tangibility_Sub</i>	67,706	0.250	0.277	0.029	0.143	0.397
<i>Size_Sub</i>	67,706	9.816	1.992	8.450	9.843	11.172
<i>RoA_Sub</i>	67,706	0.101	0.196	0.018	0.075	0.168
<i>Cash Ratio_Sub</i>	67,706	0.185	0.243	0.016	0.083	0.259
<i>Tangibility_Parent</i>	67,706	0.652	0.262	0.498	0.633	0.776
<i>Size_Parent</i>	67,706	16.013	1.687	14.939	15.955	17.213
<i>RoA_Parent</i>	67,706	0.086	0.080	0.043	0.082	0.127
<i>Cash Ratio_Parent</i>	67,706	0.135	0.135	0.044	0.092	0.171
<i>FTR</i>	63,650	0.137	0.174	0.067	0.136	0.217
<i>OutboundScore_Parent</i>	57,354	-2.126	0.502	-2.398	-2.133	-1.813
<b>Panel C: Sample of non-U.S. MNCs</b>						
<i>SalesGrowth_Sub</i>	91,258	0.104	0.487	-0.095	0.021	0.175
<i>BEAT</i>	91,258	<b>0.886</b>	0.318	1.000	1.000	1.000
<i>POST</i>	91,258	<b>0.147</b>	0.355	0.000	0.000	0.000
<i>Tangibility_Sub</i>	91,258	<b>0.258</b>	0.271	0.039	0.160	0.406
<i>Size_Sub</i>	91,258	<b>9.647</b>	1.968	8.333	9.652	10.974
<i>RoA_Sub</i>	91,258	<b>0.082</b>	0.187	0.008	0.062	0.147
<i>Cash Ratio_Sub</i>	91,258	<b>0.170</b>	0.224	0.016	0.077	0.236
<i>Tangibility_Parent</i>	91,258	<b>0.573</b>	0.217	0.436	0.555	0.683
<i>Size_Parent</i>	91,258	<b>15.951</b>	2.126	14.682	16.138	17.577
<i>RoA_Parent</i>	91,258	<b>0.060</b>	0.059	0.031	0.054	0.083
<i>Cash Ratio_Parent</i>	91,258	<b>0.123</b>	0.098	0.066	0.096	0.154
<b>Panel D: Data on corporate structures</b>						
# of Unique Subsidiaries	24,982					
# of Unique Parents	2963					
# of Subsidiary Years per Parent		53.65	120.76	6	14	49
# of Subsidiaries per Parent		8.43	17.87	1	2	8

This table presents the descriptive statistics. Panel A presents the descriptive statistics for the full sample. Panel B (Panel C) displays information for the subsample of observations with a U.S. (non-U.S.) parent. Panel D presents information on the holding structures of the MNCs in our sample. Bold mean values denote significant differences between Panel B and C at the 1% level (two-tailed).

include control variables (Column 2 of Table 5). Consistent with our predictions, the coefficient on the variable of interest ( $US \times POST \times BEAT$ ),  $\beta_1$ , is positive and statistically significant in both columns. The coefficient of 0.068 in Column 2 indicates the change in sales is 6.8 percentage points higher for U.S. BEAT subsidiaries after the TCJA relative to the control group. Using the mean sales level of \$176 million in the 9944 foreign subsidiaries of our sample MNCs subject to the BEAT, the 6.8 percentage point difference in sales growth translates into approximately \$6 billion aggregate reduction in U.S. taxes for our sample firms.<sup>22</sup> This estimate suggests an economically meaningful tax revenue loss related to cost reclassification. In Columns 3 and 4 using the size-truncated samples, we continue to find a statistically significant coefficient on  $US \times POST \times BEAT$  similar to the coefficients in Columns 1 and 2. This finding helps alleviate concerns that other factors inherent to large or small firms and contemporaneous to the BEAT enactment drive our results.

The U.S. and full sample tests suggest that subsidiaries of MNCs subject to the BEAT exhibit higher sales growth than subsidiaries of MNCs not subject to the BEAT. The consistency of the results between the different samples (U.S. sample and full sample) provides additional robustness to our results. Specifically, the U.S. sample test results, which follow a standard difference-in-differences

<sup>22</sup> \$6 billion = 5% BEAT tax rate x 0.068 x \$176 million mean sales x 9944 foreign subsidiaries of sample MNCs subject to the BEAT. Using a 95% confidence interval surrounding our coefficient estimate of 0.068 [0.010, 0.127], we estimate that the tax revenue loss per subsidiary ranges from \$85 thousand to \$1.1 million. As MNCs subject to the BEAT own on average 14.17 subsidiaries, we estimate the total tax revenue loss per MNC to range from \$1.2 to \$15.8 million.

**Table 3**  
Examining the change in foreign subsidiary sales growth post-BEAT for U.S. MNCs.

Variables	(1)	(2)	(3)	(4)
	All firms	All firms	Drop larger treatment firms	Drop larger treatment & smaller control firms
<i>BEAT</i> × <i>POST</i>	0.074*** (2.67)	0.076*** (2.82)	0.078*** (2.74)	0.057** (2.08)
<i>Tangibility_Sub</i>		0.272*** (20.19)	0.261*** (13.37)	0.258*** (13.24)
<i>Size_Sub</i>		-0.012*** (-7.08)	-0.014*** (-4.89)	-0.014*** (-4.82)
<i>RoA_Sub</i>		0.207*** (11.44)	0.254*** (9.55)	0.252*** (9.45)
<i>Cash Ratio_Sub</i>		0.191*** (14.21)	0.198*** (10.15)	0.194*** (9.89)
<i>Tangibility_Parent</i>		-0.013 (-1.01)	-0.015 (-0.83)	-0.014 (-0.76)
<i>Size_Parent</i>		0.012 (1.19)	0.009 (0.62)	0.007 (0.50)
<i>RoA_Parent</i>		0.071 (1.28)	0.144** (2.10)	0.149** (2.15)
<i>Cash Ratio_Parent</i>		-0.011 (-0.34)	-0.053 (-1.14)	-0.059 (-1.26)
Observations	65,562	65,562	31,788	31,616
Adjusted R <sup>2</sup>	0.087	0.114	0.130	0.123
Subs. Country-Industry-Year FE	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES

This table presents the regression results of Equation (1), estimated with OLS. The sample only includes subsidiaries of U.S. MNCs. The dependent variable is *SalesGrowth\_Sub*. In Columns 2 to 4, we include control variables at the subsidiary (*Sub*) and parent level (*Parent*). We define all variables in Appendix A. In Column 3 (Column 4), we drop observations of parents with consolidated revenues above the sample median (above the sample median and below \$10 million). In all columns, we include subsidiary country-industry-year fixed effects and parent fixed effects. We cluster standard errors on the firm level and report t-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

**Table 4**  
Univariate triple-difference test.

	Parent Country	Pre-BEAT	Post-BEAT	Difference:Post – Pre	Difference <sub>Above</sub> – Difference <sub>Below</sub>
Above BEAT Threshold	U.S.	0.105	0.044	-0.061***	
	Non-U.S.	0.110	0.034	-0.076***	
Below BEAT Threshold	U.S.	0.166	0.079	-0.087***	
	Non-U.S.	0.153	0.077	-0.076***	
Difference: Above – Below	U.S.	-0.061***	-0.035*		
	Non-U.S.	-0.043***	-0.043***		
Difference <sub>Post</sub> – Difference <sub>Pre</sub>	U.S.				0.026***
	Non-U.S.				0.001***
(Difference <sub>Post</sub> – Difference <sub>Pre</sub> ) <sub>U.S.</sub> – (Difference <sub>Post</sub> – Difference <sub>Pre</sub> ) <sub>Non-U.S.</sub>					0.026***

Following Cornaggia (2013), this table illustrates the triple-differences approach. Each cell of the table contains the respective mean of *SalesGrowth\_Sub*, defined as unconsolidated subsidiary sales at time  $t$  less sales at time  $t-1$ , scaled by sales at time  $t-1$ . The top (bottom) value in each cell refers to the sample with U.S. (non-U.S.) parents. Difference refers to the difference between parents below and above the BEAT threshold or before and after the BEAT. The table also indicates whether the difference between above/below threshold parents, the difference between before/after the BEAT, or the differences-in-differences is statistically significant. The bottom-right cell contains the variable of interest, the difference-in-differences-in-differences (triple-difference). The triple-difference is rounded but calculated with exact values. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

specification, validate the triple-difference approach used in the full sample tests. Our fixed effects mitigate concerns that time-invariant differences between parents or time-variant differences between subsidiary countries and/or industries drive our results. Finally, the robustness of results using truncated subsamples based on firm size helps alleviate concerns that larger or very small firms drive our results.<sup>23</sup>

<sup>23</sup> We also examine if firms most affected by other TCJA provisions drive our results. We find no difference in the sales growth rates for firms that experience the greatest benefit from the corporate tax decrease (proxied for by above versus below the median changes in the effective tax rate from 2016 to 2018) or firms subject to versus not subject to the TCJA's interest limitation (untabulated results). Importantly, to the extent other TCJA provisions decrease income shifting incentives, it would reduce firms' exposure to the BEAT and therefore bias against our results.

**Table 5**  
Examining the change in foreign subsidiary sales growth post-BEAT.

Variables	(1)	(2)	(3)	(4)
	All firms	All firms	Drop larger treatment firms	Drop larger treatment & smaller control firms
$US \times BEAT \times POST$	0.066** (2.12)	0.068** (2.28)	0.071** (2.20)	0.066** (2.08)
$US \times POST$	-0.049 (-1.61)	-0.047 (-1.60)	-0.042 (-1.36)	-0.037 (-1.23)
$BEAT \times POST$	0.009 (0.57)	0.007 (0.50)	0.004 (0.23)	-0.015 (-0.89)
$Tangibility\_Sub$		0.290*** (32.80)	0.296*** (23.06)	0.290*** (22.53)
$Size\_Sub$		-0.012*** (-11.10)	-0.014*** (-7.59)	-0.014*** (-7.51)
$RoA\_Sub$		0.225*** (18.53)	0.246*** (14.24)	0.247*** (14.11)
$Cash\_Ratio\_Sub$		0.235*** (23.69)	0.258*** (17.89)	0.252*** (17.37)
$Tangibility\_Parent$		-0.003 (-0.26)	-0.008 (-0.54)	-0.006 (-0.42)
$Size\_Parent$		-0.001 (-0.16)	-0.001 (-0.10)	-0.000 (-0.01)
$RoA\_Parent$		0.142*** (3.73)	0.160*** (3.34)	0.182*** (3.80)
$Cash\_Ratio\_Parent$		0.048* (1.79)	0.038 (1.04)	0.033 (0.90)
Observations	158,964	158,964	78,524	76,301
Adjusted R <sup>2</sup>	0.088	0.119	0.141	0.132
Subs. Country-Industry-Year FE	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES

This table presents the regression results of Equation (2), estimated with OLS. The dependent variable is *SalesGrowth\_Sub*. In Columns 2 to 4, we include control variables at the subsidiary (*\_Sub*) and parent level (*\_Parent*). We define all variables in Appendix A. In Column 3 (Column 4), we drop observations of parents with consolidated revenues above the sample median (above the sample median and below \$10 million). In all columns, we include subsidiary country-industry-year fixed effects and parent fixed effects. We cluster standard errors on the firm level and report t-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

#### 4.2. Parallel trends analysis

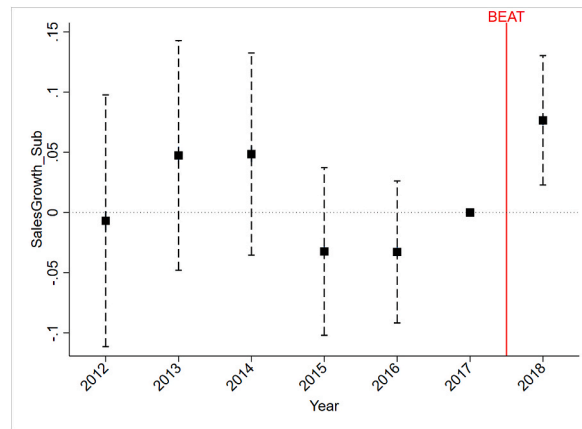
As in traditional difference-in-differences models, the primary assumption for a valid triple-differences research design is that parallel trends exist between treatment and control groups before the treatment (Atanasov and Black, 2016; Roberts and Whited, 2013). We provide evidence that the control and treatment firms exhibit similar sales growth before the BEAT implementation to establish parallel trends. We change the *POST* indicator in Equation (2) to equal one for years before 2018. We tabulate these results in Fig. 3. The coefficients on  $US \times POST \times BEAT$  ( $\beta_1$ ) are statistically indistinguishable from zero for the years before the treatment, suggesting that the parallel trends assumption is valid (Roberts and Whited, 2013). Furthermore, we use the same method to confirm the parallel trend assumption in the U.S.-only subsample in all the pre-treatment years (untabulated), supporting that research design and further validating the triple-difference research design (Atanasov and Black, 2016).

#### 4.3. Falsification tests

To further strengthen our inferences, we conduct falsification tests using subsidiary profitability and return on sales. If our results reflect the reclassification of existing related-party payments, these reclassifications will not affect subsidiaries' profitability. Furthermore, to the extent other international TCJA provisions change firms' income shifting incentives, these tests help rule out the possibility that changes in income shifting drive our results. In Table 6, we estimate Equations (1) and (2), replacing the dependent variable sales growth (*SalesGrowth\_Sub*) with growth in profitability (*ProfitGrowth\_Sub*). Consistent with our prediction, we find coefficient estimates for  $\beta_1$  that are close to zero and statistically insignificant (Columns 1 and 3), suggesting no change in the profitability of the subsidiaries of firms subject to the BEAT.<sup>24</sup> These results also suggest that other outcome variables are unaffected by the BEAT provision, further validating our research design (Roberts and Whited, 2013).

We acknowledge that the lack of statistically significant results in the above falsification test could be due to measurement error in profitability that is affected by all revenue and expense items, including one-time items, or low power. As an alternative test to help validate that we are measuring classification shifting rather than a change in income, we examine subsidiary-level return on sales as a dependent variable. The income shifting literature suggests that return on sales increases with income shifting (e.g., Klassen and

<sup>24</sup> We omit the control variable for subsidiary profitability (*RoA\_Sub*) because it is similar to the dependent variable.



**Fig. 3. Sales Growth coefficients around placebo events.** This figure reports the coefficients of OLS estimations of Equation (2) to provide evidence that the parallel trends assumption is valid. We replace the actual treatment indicator (*POST*) with years before the introduction of the BEAT. The indicator for 2017 is the benchmark year and thus omitted. The vertical bands represent 10–90% confidence intervals.

Laplante, 2012). However, return on sales should decrease with cost reclassification because income is held constant. We find negative and significant coefficient estimates for  $\beta_1$  when return on sales (*RoS\_Sub*) is the dependent variable (Table 6, Columns 2 and 4) consistent with BEAT firms experiencing a decrease in subsidiary-level return on sales in the post-BEAT period, further enhancing the validity of our results.

## 5. Cross-sectional tests using income shifting incentives

### 5.1. Pre-BEAT income shifting incentives

U.S. MNCs that structured their foreign operations to facilitate income shifting to low-tax jurisdictions before the BEAT have stronger incentives to engage in cost reclassification. Because the BEAT only affects MNCs with significant related-party payments, MNCs with more substantial outbound income shifting incentives are more likely to be negatively affected by the BEAT and have greater incentives to reclassify payments to COGS. We predict larger subsidiary-level sales growth in the post-BEAT period for firms with greater income shifting incentives.

We cannot directly observe income shifting incentives, so we use empirical proxies from prior literature to measure tax-motivated income shifting. We identify the presence of subsidiaries in jurisdictions that are conducive to international tax planning and classify these subsidiaries as tax planning subsidiaries (e.g., Blouin and Robinson, 2021; Dyreng et al., 2015).<sup>25</sup> Given our sample's composition (Table 1, Panel B), tax planning subsidiaries include subsidiaries located in Ireland, Luxemburg, Malta, the Netherlands, and Singapore. We examine whether the subsidiary-level difference in sales growth is more substantial in tax planning subsidiaries. This test requires financial data in Orbis for the subsidiary.

Our second income shifting incentive proxy focuses on the prevalence of tax planning subsidiaries within an MNC. We examine whether foreign subsidiaries' sales growth is larger for subsidiaries of MNCs with relatively more tax planning subsidiaries. We use the Orbis database to construct the MNCs' geographical footprint and calculate the number of the MNC's subsidiaries located in tax planning jurisdictions relative to its total number of subsidiaries. This test only requires subsidiaries' locations, so we can identify more tax planning jurisdictions than in our previous test. Therefore, we include all countries designated by Gravelle (2015) as tax havens. We classify MNCs in the highest quartile of the percentage of tax planning subsidiaries as MNCs with greater income shifting incentives.

Our third proxy for income shifting incentives is the number of patents an MNC holds in its foreign subsidiaries. Patents are ideal tax planning assets because they are intangible and receive tax-favored status in many jurisdictions (Bornemann et al., 2023; Evers et al., 2015). MNCs can strategically place patents in tax-favorable jurisdictions and use related-party royalty payments to shift income from the U.S. to lower tax rate jurisdictions. Royalty payments are among the primary related-party payments the BEAT targets and one of the most likely payments eligible for reclassification (Avi-Yonah, 2018; PwC, 2018). We use the PATSTAT database from the European Patent Office (EPO) to measure the number of patents an MNC holds in its foreign subsidiaries. We sort MNCs based on the number of patents in their foreign subsidiaries. More patents abroad likely translate to greater income shifting incentives. We classify MNCs with above the median number of patents abroad relative to other MNCs in the MNC's home country as "high foreign patent MNCs".

<sup>25</sup> MNCs with more tax planning subsidiaries are more likely to engage in international tax planning (Dyreng and Lindsey, 2009; Markle and Shackelford, 2012). Furthermore, all tax planning subsidiaries in these analyses have a tax rate below the post-TCJA U.S. corporate tax rate of 21%. Therefore, firms with tax planning subsidiaries continue to have incentives to use related-party payments to shift income out of the U.S. even after the decrease in the corporate tax rate.

**Table 6**  
Falsification tests – growth in profitability and return on sales as the dependent variables.

Variables	(1)	(2)	(3)	(4)
	U.S. Sample		Full Sample	
	DV: <i>ProfitGrowth_Sub</i>	DV: <i>RoS_Sub</i>	DV: <i>ProfitGrowth_Sub</i>	DV: <i>RoS_Sub</i>
<b><i>BEAT</i> × <i>POST</i></b>	<b>0.007</b>	<b>-0.019**</b>	0.005	0.002
	(0.71)	(-2.17)	(0.89)	(0.40)
<i>US</i> × <i>POST</i>			0.003	0.020**
			(0.28)	(2.07)
<b><i>US</i> × <i>BEAT</i> × <i>POST</i></b>			<b>0.003</b>	<b>-0.018*</b>
			(0.26)	(-1.83)
<i>Tangibility_Sub</i>	0.020***	-0.016**	0.022***	-0.015***
	(6.39)	(-2.54)	(10.77)	(-3.92)
<i>Size_Sub</i>	-0.000	0.011***	-0.000	0.011***
	(-0.20)	(10.61)	(-0.21)	(17.86)
<i>Cash Ratio_Sub</i>	0.062***	0.092***	0.076***	0.103***
	(15.73)	(17.05)	(27.39)	(29.83)
<i>Tangibility_Parent</i>	0.001	-0.001	-0.002	-0.003
	(0.33)	(-0.33)	(-0.51)	(-1.03)
<i>Size_Parent</i>	-0.000	0.008***	-0.002	0.007***
	(-0.05)	(2.60)	(-0.94)	(3.17)
<i>RoA_Parent</i>	0.065***	0.078***	0.072***	0.100***
	(4.21)	(5.11)	(6.23)	(9.57)
<i>Cash Ratio_Parent</i>	-0.006	-0.002	-0.009	0.002
	(-0.59)	(-0.21)	(-1.21)	(0.22)
Observations	64,738	64,173	157,015	155,996
Adjusted R <sup>2</sup>	0.030	0.150	0.037	0.167
Subs. Country-Industry-Year FE	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES

Columns 1 and 2 (3 and 4) of this table present the regression results of Equation (1) (Equation (2)), estimated with OLS. The sample in Columns 1 and 2 (3 and 4) includes only subsidiaries of U.S. MNCs (all subsidiaries). The dependent variable in Columns 1 and 3 is *ProfitGrowth\_Sub*. The dependent variable in Columns 2 and 4 is *RoS\_Sub*. We restrict *ProfitGrowth\_Sub* and *RoS\_Sub* to lie within [-1,1] to account for outliers. We include control variables at the subsidiary (*Sub*) and parent level (*Parent*). We define all variables in Appendix A. We include subsidiary country-industry-year fixed effects and parent fixed effects. We cluster standard errors on the firm level and report t-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

## 5.2. Cross-sectional results

For all three cross-sectional tests, we separately estimate Equation (1) and Equation (2) for the MNCs with higher versus lower income shifting incentives and predict that subsidiary sales growth rates are higher in MNCs with greater income shifting incentives. We estimate Equation (1) for the U.S.-only sample and present the results in Table 7. We report the effect of the BEAT on foreign subsidiaries' sales growth for tax planning versus non-tax planning subsidiary countries in Columns (1) and (2), respectively. The coefficient on *BEAT* × *POST* ( $\beta_1$ ) is positive and statistically significant only for subsidiaries in tax planning countries. Moreover, the effect is significantly larger than for subsidiaries in non-tax planning countries (Columns 1 > 2: Diff = 0.387, *p*-value < 0.01). Columns (3) and (4) present results from splitting the sample based on the proportion of an MNC's subsidiaries in a tax planning country. The coefficient estimate is statistically significant only for MNCs with a relatively high proportion of foreign subsidiaries in tax planning countries (Column 3). Finally, we provide results using patent data in the U.S. only sample. We find positive and statistically significant coefficient estimates on *SalesGrowth\_Sub* for MNCs with more (fewer) patents in foreign subsidiaries Columns 5 (Column 6). While the effect is concentrated in MNCs with a large proportion of foreign subsidiaries in tax planning countries as well as more patents abroad, the differences in coefficients are not statistically significant (Columns 3 > 4: Diff = 0.082, *p*-value = 0.15; Columns 5 > 6: Diff = 0.061, *p*-value = 0.33).

For the full sample of MNCs, we estimate Equation (2) and present the results in Table 8. We find a statistically significant coefficient estimate on *US* × *BEAT* × *POST* ( $\beta_1$ ) only for firms with tax planning subsidiaries (Column 1). The effect is also significantly larger for firms with tax planning subsidiaries (Columns 1 > 2: Diff = 0.281, *p*-value = 0.02). We present results for MNCs with a high (low) share of tax planning subsidiaries in Column 3 (4). We find a statistically significant coefficient estimate only for MNCs with a relatively high proportion of tax planning subsidiaries (Column 3). The coefficient estimate is also significantly larger than for MNCs with a low proportion of tax planning subsidiaries (Columns 3 > 4: Diff = 0.151, *p*-value = 0.03). Finally, our results using patent data show that MNCs with relatively more patents in foreign subsidiaries (Column 5) engage in more related-party cost reclassification; the coefficient estimate is positive and significant for both groups (Columns 5 and 6), but the difference in coefficients is not significant at a two-tailed threshold (Columns 5 > 6: Diff = 0.177, *p*-value = 0.13).

Combined, the cross-sectional tests presented in Tables 7 and 8 suggest MNCs with greater income shifting incentives and arguably more related-party payments before the BEAT exhibit more cost reclassification post-BEAT. The cross-sectional results strengthen the

**Table 7**  
Cross-sectional tests – U.S. MNCs.

Variables	(1)		(2)		(3)		(4)		(5)		(6)	
	Subsidiary in tax planning country				Proportion of subsidiaries in tax planning countries				Share of patents abroad			
	Yes	No	Yes	No	High	Low	High	Low	High	Low	High	Low
<i>BEAT</i> × <i>POST</i>	0.430*** (3.77)	0.043 (1.53)	0.110*** (2.95)	0.028 (0.64)	0.135** (2.44)	0.074** (2.51)						
Controls: included												
Test: <i>BEAT</i> × <i>POST</i>		<i>p</i> -value: <0.01			<i>p</i> -value: 0.15					<i>p</i> -value: 0.33		
(1) = (2); (3) = (4); (5) = (6)												
Observations	3241	62,321	21,746	41,273	27,133	36,389						
Adjusted R <sup>2</sup>	0.125	0.113	0.129	0.113	0.117	0.117						
Subs. Country-Industry-Year FE	YES	YES	YES	YES	YES	YES						
Parent FE	YES	YES	YES	YES	YES	YES						

This table presents the regression results of Equation (1), estimated with OLS. The sample only includes subsidiaries of U.S. MNCs. The dependent variable is *SalesGrowth<sub>Sub</sub>*. We include the following control variables at the subsidiary (*Sub*) and parent level (*Parent*): *Tangibility*, *Size*, *RoA*, and *CashRatio*. We define all variables in Appendix A. In Columns 1 and 2, we split the sample based on subsidiaries incorporated in tax planning countries. In Columns 3 and 4, we split the sample based on the relative share of an MNC's subsidiaries in tax planning countries. In Columns 5 and 6, we split the sample based on MNCs with a high and low number of patents in their foreign subsidiaries, respectively. We include subsidiary country-industry-year fixed effects and parent fixed effects. For each group (i.e., Columns 1 and 2, 3 and 4, and 5 and 6), we test for differences between the coefficient estimates on *BEAT* × *POST* and provide two-tailed *p*-values. We cluster standard errors on the firm level and report *t*-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

internal validity of our study and help alleviate concerns that our results are due to other TCJA changes by showing that firms most affected by the BEAT provision primarily drive our results.

### 5.3. Additional cross-sectional tests for the U.S.-only sample

We rely on empirical proxies to identify income shifting incentives in our cross-sectional analyses because we cannot directly observe related-party transactions. We create two additional empirical proxies for income shifting incentives for the U.S.-only sample to provide further support. First, we use the firm's average foreign effective tax rates (*FTR*) to capture the incentive of U.S. MNCs to shift income (e.g., De Simone et al., 2019; Klassen and Laplante, 2012). We calculate *FTR* as the difference between the U.S. statutory tax rate before the TCJA (35%) and the firm's average foreign effective tax rate (*TXFO* + *TXDFO*, scaled by *PIFO* in Compustat). *FTR* is positive when a firm's average foreign effective tax rate is below 35% leading to an incentive to shift income out of the U.S. We calculate one average foreign effective tax rate per MNC for 2011–2016. A multi-year measure of *FTR* allows us to capture tax planning over multiple periods (Klassen and Laplante, 2012) and excludes the effects of the corporate tax rate reduction on the effective tax rate due to the revaluation of deferred taxes (Dyreg et al., 2020).<sup>26</sup>

Second, we use the *OutboundScore* measure from De Simone et al. (2019) that captures U.S. MNCs' net outbound income shifting incentives. We use these scores to calculate a parent-level mean value for 2005–2014 (labeled *OutboundScore<sub>Parent</sub>*), the sample period in De Simone et al. (2019). We classify firms whose mean of *OutboundScore<sub>Parent</sub>* is above the industry's median as high outbound income shifters.<sup>27</sup>

In Column 1 (2) of Table 9, we define firms with *FTR* above (below) zero as high (low) income shifting incentive firms. As predicted, the effect of the BEAT on firms' reclassification of related-party payments to COGS is concentrated in MNCs with *FTR* above zero but the difference in coefficients is not statistically significant (Columns 1 > 2: Diff = 0.063, *p*-value = 0.37). Our results also hold and generally get stronger if we define *FTR* relative to the new 21% corporate tax rate (untabulated coefficient estimate 0.107 (*t*-stat = 2.47) for Column 1; Columns 1 > 2: Diff = 0.100, *p*-value = 0.10). Given most firms in our sample have a positive *FTR*, we also partition the sample along the distribution of *FTR* and report results in Columns 3 and 4 of Table 9. In Column 3 (4), we classify firms with an *FTR* in the highest quartile (first three quartiles) as high (low) income shifting firms before the BEAT. Results are consistent with our primary *FTR* analyses with a significantly larger effect for firms in the highest *FTR* quartile (Columns 3 > 4: Diff = 0.120, *p*-value = 0.06). Overall, these results suggest that firms with incentives to use related-party payments for outbound income shifting, even after the decrease in the U.S. corporate tax rate, engage in the most cost reclassification.

In Columns 5 and 6 of Table 9, we present results using *OutboundScore<sub>Parent</sub>*. We predict that firms with an *OutboundScore<sub>Parent</sub>* above the industry median have higher income shifting incentives before the BEAT and, therefore, greater incentives to reclassify payments as COGS to avoid the BEAT. Consistent with our prediction, the coefficient on *BEAT* × *POST* for firms with a high *OutboundScore<sub>Parent</sub>* (Column 5) is positive and statistically significant. Although the effect is concentrated in firms with a high

<sup>26</sup> Following De Simone et al. (2019), we limit the sample to firms where *FTR* is between −1 and 1.

<sup>27</sup> Using confidential IRS data, De Simone et al. (2019) estimate the determinants of outbound shifting and use these estimates to calculate a score (*OutboundScore*) with publicly available data from Compustat. The scores are available at Lisa De Simone's website: <https://sites.google.com/view/lisa-desimone/outbound-scores>.

**Table 8**  
Cross-sectional tests – full sample.

Variables	(1)		(2)		(3)		(4)		(5)		(6)	
	Subsidiary in tax planning country				Proportion of subsidiaries in tax planning countries				Share of patents abroad			
	Yes	No	High	Low	High	Low	High	Low	High	Low		
<i>US</i> × <i>BEAT</i> × <i>POST</i>	0.326** (2.56)	0.045 (1.47)	0.152*** (3.12)	0.009 (0.20)	0.240** (2.16)	0.063* (1.95)						
<i>US</i> × <i>POST</i>	-0.270** (-2.21)	-0.025 (-0.84)	-0.114** (-2.44)	0.007 (0.16)	-0.207* (-1.87)	-0.049 (-1.58)						
<i>BEAT</i> × <i>POST</i>	0.056 (0.86)	0.001 (0.06)	-0.021 (-0.70)	0.018 (1.04)	-0.075 (-0.83)	0.009 (0.58)						
Controls: included												
Test: <i>US</i> × <i>BEAT</i> × <i>POST</i>	p-value: 0.02				p-value: 0.03				p-value: 0.13			
(1) = (2); (3) = (4); (5) = (6)												
Observations	7918	151,046	36,728	118,628	60,185	95,594						
Adjusted R <sup>2</sup>	0.145	0.118	0.138	0.118	0.116	0.124						
Subs. Country-Industry-Year FE	YES	YES	YES	YES	YES	YES						
Parent FE	YES	YES	YES	YES	YES	YES						

This table presents the regression results of Equation (2), estimated with OLS. The dependent variable is *Sales\_Growth\_Sub*. We include the following control variables at the subsidiary (*Sub*) and parent level (*Parent*): *Tangibility*, *Size*, *RoA*, and *CashRatio*. We define all variables in Appendix A. In Columns 1 and 2, we split the sample based on subsidiaries incorporated in tax planning countries. In Columns 3 and 4, we split the sample based on the relative share of an MNC's subsidiaries in tax planning countries. In Columns 5 and 6, we split the sample based on MNCs with a high and low number of patents in their foreign subsidiaries, respectively. We include subsidiary country-industry-year fixed effects and parent fixed effects. For each group (i.e., Columns 1 and 2, 3 and 4, and 5 and 6), we test for differences between the coefficient estimates on *US* × *BEAT* × *POST* and provide two-tailed *p*-values. We cluster standard errors on the firm level and report *t*-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

*OutboundScore\_Parent*, the difference in coefficients is not significant (Columns 5 > 6: Diff = 0.098, *p*-value = 0.15). In sum, the additional cross-sectional U.S.-only sample tests suggest more cost reclassification for firms with greater income shifting incentives, strengthening our findings from the previous cross-sectional tests.

## 6. Additional analyses

### 6.1. External and internal consequences

As we note in the hypothesis development, there are potential external and internal consequences to cost reclassification. Given we find significant evidence of firms engaging in this tax planning strategy on average, these costs do not appear to outweigh the benefits. This section explores the external and internal consequences of cost reclassification.

First, we investigate whether cost reclassification is associated with UTB increases at the parent level to examine this potential external financial reporting consequence. Cost reclassification is considered a current tax position because this tax planning strategy only takes place following TCJA enactment. We measure the current increase in UTBs using both the change in the total UTB balance (*UTB\_Total\_Parent*) and increases in UTBs related to current year tax positions (*UTB\_CY\_Parent*).<sup>28</sup> In Column 1 of Table 10, we find that BEAT firms have significantly larger increases in total UTBs in the post-BEAT period than non-BEAT firms, consistent with BEAT firms creating tax reserves for the cost reclassification tax planning strategy. The coefficient, 0.134, implies an economically meaningful increase of around 36% relative to the interquartile range of 0.37. In Column 2, we use *UTB\_CY\_Parent* as the dependent variable and find that the coefficient of 0.047 is positive but not significant at a two-tailed threshold (*p*-value = 0.13). Overall, the result suggests a potential external financial reporting consequence of cost reclassification.

Internally, there are also potential implementation and operational costs to cost reclassification. Changing the internal accounting system might decrease the quality of information available to managers. We investigate this potential consequence empirically by examining the internal information quality of BEAT firms. We use three proxies for internal information quality: the time delay in earnings announcements, management forecast accuracy, and the presence of an internal control weakness. We measure these variables at the parent-level (*Earnings Announcement Lag\_Parent*, *Mgmt Forecast Accuracy\_Parent*, *Mgmt Forecast Accuracy\_Parent\_Low*, and *ICW\_Parent*) following Gallemore and Labro (2015).<sup>29</sup>

<sup>28</sup> UTB data is not uniformly well populated, especially for individual line items of the UTB reconciliation such as "increases in UTBs related to current year tax positions" (*TXSUBPOSINC* in Compustat). Therefore, we also use the change in the total UTB balance (*TXSUBEND* – *TXSUBBEGIN* in Compustat) as an alternative measure of the change in the UTB.

<sup>29</sup> While internal information quality (IIQ) is inherently difficult to measure, providing evidence using three different proxies for IIQ helps alleviate the concern that one variable may not adequately capture IIQ. Gallemore and Labro (2015) suggest that factors that decrease the capacity of the firm's accounting system to quickly integrate information from different parts of the organization increases earnings announcement lags, decreases management's earnings forecast accuracy, and/or creates internal control weaknesses.

**Table 9**  
Additional cross-sectional tests for U.S. MNCs.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	<i>FTR</i> > 0	<i>FTR</i> < 0	<i>FTR</i> in highest quartile	<i>FTR</i> in lower quartiles	<i>OutboundScoreParent</i> above median	<i>OutboundScoreParent</i> below median
<b><i>BEAT</i> × <i>POST</i></b>	<b>0.071**</b> (2.06)	<b>0.008</b> (0.12)	<b>0.131**</b> (2.49)	<b>0.011</b> (0.29)	<b>0.116**</b> (2.32)	<b>0.018</b> (0.40)
Controls: included						
Test: <i>BEAT</i> × <i>POST</i>	p-value: 0.37		p-value: 0.06		p-value: 0.15	
(1) = (2); (3) = (4); (5) = (6)						
Observations	53,928	5712	13,943	45,438	14,714	38,571
Adjusted R <sup>2</sup>	0.113	0.096	0.127	0.107	0.131	0.105
Subs. Country-Industry-Year FE	YES	YES	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES	YES	YES

This table presents the regression results of Equation (1), estimated with OLS. The sample only includes subsidiaries of U.S. MNCs. The dependent variable is *SalesGrowthSub*. We include the following control variables at the subsidiary (*Sub*) and parent level (*Parent*): *Tangibility*, *Size*, *RoA*, and *CashRatio*. We define all variables in Appendix A. In Columns 1 and 2, we split the sample based on MNCs' *FTR* being above and below zero, respectively. In Columns 3 and 4, we split the sample based on MNCs' *FTR* being in the highest quartile and the three lower quartiles, respectively. In Columns 5 and 6, we split the sample based on MNCs' *OutboundScoreParent* being above and below the median, respectively. The sample is not evenly split across columns (5) and (6) because the median split is computed at the parent level while the observations are at the subsidiary level. We include subsidiary country-industry-year fixed effects and parent fixed effects. For each group (i.e., Columns 1 and 2, 3 and 4, and 5 and 6), we test for differences between the coefficient estimates on *BEAT* × *POST* and provide two-tailed *p*-values. We cluster standard errors on the firm level and report *t*-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

We display the results in Tables 10 and 11. We present the earnings announcement lag tests in Column 3 of Table 10. We measure the lag variable (*Earnings Announcement LagParent*) as the number of days between the fiscal year end and the firm's earnings announcement. The coefficient estimate on *BEAT* × *POST* of 2.857 in Column 3 implies that after the TCJA, BEAT firms delay their earnings announcement by around 2.9 days. This effect is consistent with the earnings announcement delay of 1.3 days during the Covid pandemic (deHaan et al., 2023) or the reduction of earnings announcement delays of three days for firms that fall under the SEC regulation for shorter filing deadlines (Truong, 2023).

We also find some evidence of lower management forecast accuracy for BEAT firms in the post-TCJA period. In Column 4 of Table 10, we use a continuous variable for management forecast accuracy (*Mgmt Forecast AccuracyParent*) and find the sign of the coefficient on *BEAT* × *POST* is negative as predicted but is not statistically significant (Coeff = -0.002, *p*-value = 0.17). In Column 5, we use a binary measure (*Mgmt Forecast AccuracyParentLow* = 1 for firms below the median) to examine the likelihood of having lower forecast accuracy compared to other firms. The coefficient estimate of 0.195 (*p*-value < 0.05) implies that BEAT firms exhibit a 19.5 percentage point higher likelihood of having low management forecast accuracy after the TCJA.<sup>30</sup>

In Table 11, we report the results of a logistic regression with the binary indicator variable *ICWParent* as the dependent variable to estimate the probability of an internal control weakness in BEAT firms after the TCJA (Cheng et al., 2013; Doyle et al., 2007). The coefficient on *BEAT* × *POST* is positive and statistically significant, suggesting that BEAT firms are more likely to report an internal control weakness after the TCJA.<sup>31</sup> The results in Tables 10 and 11 suggest that firms affected by the BEAT likely face external financial reporting costs, as well as, internal information costs when reclassifying related-party payments to avoid the BEAT.<sup>32</sup>

## 6.2. Robustness tests

To address concerns about observable differences between subsidiaries of U.S. and non-U.S. parents in the full sample, we follow recent cross-country research and employ entropy balancing (e.g., Lewellen et al., 2021). We use the first and second moments to reweight the observations and achieve covariate balance along our control variables at the parent and subsidiary levels (Hainmueller, 2012; McMullin and Schonberger, 2020).<sup>33</sup> We confirm our full sample results in Table 5 (Column 2) using this entropy balancing approach (untabulated *p*-value < 0.10). To address concerns that size differences between treatment and control firms confound our results, we exploit the BEAT revenue threshold of \$500 million and implement a regression discontinuity design (Cattaneo et al., 2019; De Simone and Olbert, 2022; McCrary, 2008). Consistent with our main results, we find that BEAT firms have significantly higher

<sup>30</sup> We follow the insights of prior studies (e.g., Feng et al., 2009) and exclude observations with a loss or an internal control weakness for the management forecast accuracy tests.

<sup>31</sup> We calculate the marginal effect and find that the coefficient, 0.616, implies a 3.3 percentage point higher probability of an internal control weakness for BEAT firms after the TCJA.

<sup>32</sup> McGuire et al. (2018) find a positive association between IIQ and tax motivated income shifting. Therefore, the finding of reduced IIQ associated with COGS reclassification could suggest that firms have reduced opportunities for future income shifting.

<sup>33</sup> We balance on the pre-treatment period to avoid the treatment affecting the balancing (McMullin and Schonberger, 2022).



**Table 10**  
External and internal consequences at the parent level.

Variables	(1)	(2)	(3)	(4)	(5)
	DV: <i>UTB Total_Parent</i>	DV: <i>UTB CY_Parent</i>	DV: <i>Earnings Announcement Lag_Parent</i>	DV: <i>Mgmt Forecast Accuracy_Parent</i>	DV: <i>Mgmt Forecast Accuracy_Parent_Low</i>
<i>BEAT</i> × <i>POST</i>	0.134* (1.83)	0.047 (1.53)	2.857** (2.10)	-0.002 (-1.39)	0.195** (2.11)
<i>Tangibility_Parent</i>	1.002*** (8.23)	0.119*** (2.87)	4.602*** (3.55)	0.002** (2.13)	0.093 (1.36)
<i>Size_Parent</i>	0.057 (1.24)	0.033 (1.57)	-4.547*** (-5.14)	-0.002** (-2.14)	0.022 (0.37)
<i>RoA_Parent</i>	-0.375 (-1.55)	0.006 (0.06)	-15.486*** (-4.56)	0.021*** (2.98)	-0.645** (-2.25)
<i>Cash Ratio_Parent</i>	0.956*** (4.60)	0.298*** (3.31)	-10.225*** (-4.16)	-0.002 (-0.66)	0.192 (1.22)
Observations	5648	5629	6347	2174	2174
Adjusted R <sup>2</sup>	0.068	0.119	0.703	0.475	0.301
Year FE	YES	YES	YES	YE	YES
Parent FE	YES	YES	YES	YES	YES

This table presents the regression results at the parent level of U.S. MNCs. Columns 1 and 2 focus on unrecognized tax benefits (*UTB Total\_Parent* and *UTB CY\_Parent*, respectively). Column 3 presents results for the delay in a MNCs' earnings announcement (*Earnings Announcement Lag\_Parent*). Columns 4 and 5 present the results for management forecast accuracy (*Mgmt Forecast Accuracy\_Parent* and *Mgmt Forecast Accuracy\_Low*, respectively). All continuous dependent variables (i.e., Columns 1 to 4) are winsorized at the first and 99th percentiles. We include parent-level control variables, year fixed effects, and parent fixed effects. We define all variables in [Appendix A](#). We cluster standard errors on the firm level and report t-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

**Table 11**  
Internal Control Weaknesses at the parent level.

Variables	(1)DV: <i>ICW_Parent</i>
<i>BEAT</i> × <i>POST</i>	0.616* (1.71)
<i>BEAT</i>	-0.497* (-1.67)
<i>POST</i>	-0.210 (-0.71)
<i>Tangibility_Parent</i>	0.548* (1.89)
<i>Size_Parent</i>	-0.241*** (-3.24)
<i>RoA_Parent</i>	-5.770*** (-5.72)
<i>Cash Ratio_Parent</i>	-2.735*** (-4.62)
Observations	5175
Pseudo R <sup>2</sup>	0.107
Industry FE	YES

This table presents the logistic regression results at the parent level of U.S. MNCs. The dependent variable is *ICW\_Parent*. We include parent-level control variables and industry fixed effects. We define all variables in [Appendix A](#). We cluster standard errors on the firm level and report z-statistics in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

subsidiary-level sales growth after the TCJA (untabulated). We also examine whether our results hold if we extend the sample period and define *POST* for both 2018 and 2019 observations. The results in [Tables 3 and 6 through 9](#), and Column 3 of [Table 10](#) hold (untabulated p-values <0.10 where predicted). However, the results in [Tables 5 and 10](#) (except Column 3, untabulated p-value <0.05), and 11 are directionally consistent but not statistically significant when we include 2019. Overall, the results including 2019 are weaker than the results with only 2018, suggesting that the majority of cost reclassification behavior and its consequences take place in 2018 immediately following the TCJA.<sup>34</sup>

<sup>34</sup> Showing the response to the tax law change in a tight one-year treatment window following its enactment enhances the internal validity of our study (Duflo, 2002). Given our dependent variable is measured as a change variable, the amount of change in 2018 affects the starting point for computing the change in 2019.

## 7. Conclusion

Proponents of international tax reform argue that the current system allows firms to avoid U.S. taxes (White House, 2021; U.S. Department of the Treasury, 2022). The TCJA fundamentally altered the U.S. tax system. Among the significant provisions was the change from a worldwide to a territorial tax system, which increased the incentives to shift income via related-party payments from the U.S. to lower tax rate jurisdictions (Albertus et al., 2022). To curtail these base erosion payments, the TCJA enacted the BEAT. However, critics of the BEAT note that excluding COGS payments from related-party payments effectively allows firms to reclassify related-party payments as COGS to avoid the tax. This exclusion potentially undermines the territorial tax regime and hinders the BEAT's effectiveness in combatting base erosion and profit shifting (Bavis, 2019; Dharmapala, 2018; Kamin et al., 2018; Kysar, 2018).

Our study documents a behavioral response to the BEAT consistent with these concerns, whereby U.S. MNCs reclassify related-party payments as COGS to avoid the BEAT. Our results imply a difference of 6.8 percentage points in sales growth for foreign subsidiaries of U.S. MNCs subject to the BEAT relative to foreign subsidiaries of non-BEAT MNCs in the year following BEAT enactment. This estimate implies an approximate \$6 billion aggregate reduction in U.S. taxes in 2018 for our sample firms. In cross-sectional tests, we find the results are concentrated in firms with greater income shifting incentives and firms most adversely affected by the BEAT. These results help alleviate concerns that our results are attributable to other TCJA changes. We also document some evidence of external and internal consequences, including increased tax reserves and reduced internal information quality, of cost reclassification.

Overall, our results provide timely evidence for policymakers as they consider tax reform to remove the COGS exclusion or eliminate the BEAT (Build Back Better Act, 2021; U.S. Department of the Treasury, 2022). We document how firms successfully tax plan to avoid the BEAT and explain the BEAT's revenue shortfall. The government initially predicted the BEAT would raise over \$5 billion in 2018. Only \$1.8 billion in tax collections materialized (The Committee of Conference, 2017; U.S. Department of the Treasury, 2021). Our results suggest cost reclassification is an important determinant of this revenue loss. Our findings are also of interest to researchers and policymakers evaluating the effects of the TCJA on firm behavior (e.g., Beyer et al., 2023; Carrizosa et al., 2023; De Simone et al., 2022; Gaertner et al., 2020; Pfitsch, 2023; Samuel, 2022; Wagner et al., 2020; Xu et al., 2018). We provide evidence of an unintended consequence of the TCJA: cost reclassification to avoid the BEAT. This evidence answers calls to inform policymakers on the outcomes of tax regime changes and the effects of the TCJA's international tax changes on firm behavior (Donohoe et al., 2019; Hanlon and Heitzman, 2010; Wilde and Wilson, 2018). Our findings also inform global tax policy aimed at limiting MNCs' ability to use related-party payments for tax planning purposes and highlight how behavioral responses can reduce revenue estimates of specific tax provisions.

## Appendix A. Variable definitions

Variable	Definition
BEAT	Indicator variable that is equal to one if the three-year average operating revenues of parent $p$ are greater than \$500 million in 2015–2017 and zero otherwise.
CashRatio_Sub	Cash and cash equivalents of subsidiary $s$ at time $t$ scaled by lagged total assets ( $t-1$ ).
CashRatio_Parent	Cash and cash equivalents of parent $p$ at time $t$ scaled by lagged total assets ( $t-1$ ).
Earnings Announcement Lag_Parent	Earnings Announcement Lag of parent $p$ , defined as the number of days between the end of the fiscal year and the firm's earnings announcement.
ICW_Parent	Indicator variable that is equal to one if parent $p$ has an Internal Control Weakness (ICW) at time $t$ and zero otherwise.
Mgmt Forecast Accuracy_Parent	Management Forecast Accuracy of parent $p$ , defined as the absolute difference between reported earnings and management guidance, scaled by the year-end share price and multiplied by negative one.
Mgmt Forecast Accuracy_Parent_Low	Indicator variable that is equal to one if Management Forecast Accuracy of parent $p$ is below the median and zero otherwise.
POST	Indicator variable that is equal to one for observations with a tax year after 2017 and zero otherwise.
RoA_Sub	Return on Assets of subsidiary $s$ , defined as profit before tax at time $t$ scaled by lagged total assets ( $t-1$ ).
RoA_Parent	Return on Assets of parent $p$ , defined as profit before tax at time $t$ scaled by lagged total assets ( $t-1$ ).
RoS_Sub	Return on Sales of subsidiary $s$ , defined as profit before tax over net sales (both at time $t$ ).
ProfitGrowth_Sub	Growth in profitability at time $t$ , calculated as the change in profit before tax of subsidiary $s$ relative to the prior year's profit before tax divided by the prior year's total assets ( $t-1$ ).
SalesGrowth_Sub	Change in net sales of subsidiary $s$ at time $t$ , calculated as the change in net sales divided by the prior year's net sales ( $t-1$ ). In countries where net sales is not available (Australia, Ireland, Russia, and the U.K.), the change in net sales is replaced by the change in operating revenue.
Size_Sub	Natural logarithm of total assets of subsidiary $s$ at time $t$ .
Size_Parent	Natural logarithm of total assets of parent $p$ at time $t$ .
Tangibility_Sub	Fixed assets of subsidiary $s$ at time $t$ scaled by lagged total assets ( $t-1$ ).
Tangibility_Parent	Fixed assets of parent $p$ at time $t$ scaled by lagged total assets ( $t-1$ ).
US	Indicator variable that is equal to one if parent $p$ is headquartered in the U.S. and zero otherwise.
UTB_CY_Parent	Current Year Unrecognized Tax Benefit (UTB) of parent $p$ , defined as the increase to UTB from current year tax positions (TXTUBPOSINC in Compustat) scaled by the beginning-of-year UTB.
UTB_Total_Parent	Total Unrecognized Tax Benefit (UTB) of parent $p$ , defined as the change in end-of-year and beginning-of-year UTB (TXTUBEND and TXTUBBEGIN in Compustat) scaled by the beginning-of-year UTB.

## Appendix B. BEAT numerical example

Case #1 Base Case Financial Statements				Case #2 Shift \$1,000 Royalty Fee to COGS Financial Statements			
	U.S. Parent	Foreign Sub	Consolidated		U.S. Parent	Foreign Sub	Consolidated
Sales to customers	2,500.00	800.00	2,500.00	Sales to customers	2,500.00	1,800.00	2,500.00
COGS (purchase from Foreign Sub)	800.00	-	-	COGS (purchase from Foreign Sub)	800.00	-	-
COGS other from Foreign Sub		50.00	50.00	COGS other from Foreign Sub	1,000.00	50.00	50.00
Gross profit	1,700.00	750.00	2,450.00	Gross profit	700.00	1,750.00	2,450.00
Other income		1,000.00		Other income		-	
A Royalty fee to Foreign sub	1,000.00			Royalty fee to Foreign sub	-		
Domestic operating expenses	500.00	20.00	520.00	Domestic operating expenses	500.00	20.00	520.00
B Pre-Tax Income (PTI)	200.00	1,730.00	1,930.00	Pre-Tax Income (PTI)	200.00	1,730.00	1,930.00
<b>Federal Tax Return</b>				<b>Federal Tax Return</b>			
C Reg. U.S. Tax Liability (PTI × 21%)	\$	42.00		Reg. U.S. Tax Liability (PTI × 21%)	\$	42.00	
<b>BEMTA CALCULATION (5% BEAT RATE)</b>				<b>BEMTA CALCULATION (5% BEAT RATE)</b>			
MODIFIED TAXABLE INCOME (MTI)	\$	1,200.00	B + A*	MODIFIED TAXABLE INCOME (MTI)	\$	200.00	
D BEAT BENCHMARK (MTI × 5%)	60.00	MTI × 5%		BEAT BENCHMARK (MTI × 5%)	10.00		
E Tax Treated as Paid	42.00	Equal to C		Tax Treated as Paid	42.00		
F BEAT Addition to Tax	18.00	D - E		BEAT Addition to Tax	-		
TOTAL US TAX LIABILITY	60.00	C + F		TOTAL US TAX LIABILITY	42.00		
Effective tax rate	30.00%			Effective tax rate	21.00%		

This appendix presents a comparison of the BEAT calculations, including the Base Erosion Minimum Tax Amount (BEMTA) and total U.S. tax liability, when a firm has non-COGS related-party payments compared to COGS related-party payments. \* Modified taxable income (MTI) is calculated as pre-tax income plus non-COGS related-party payments (royalties in Case #1).

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