Tax-Induced Organizational Complexity and Executive Performance Measurement

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Abstract

We examine how tax-induced organizational complexity ("TIOC"), which we define as the organizational complexity that would not exist in a zero-tax world, is associated with executive performance measurement. While these structures can facilitate lower tax burdens, firms need to design their performance measurement systems to encourage executives to manage the associated complexity to avoid potential negative consequences. Using firms' subsidiary structures in tax havens and other low tax countries to measure TIOC, we document several main findings. We find that TIOC is associated with longer-term performance measurement, consistent with boards wanting executives to manage both the short-run tax benefits and longer-run costs associated with TIOC. We also find that TIOC is associated with a greater propensity to use adjusted performance metrics, consistent with firms correcting standard metrics for measurement error and bias introduced by TIOC. Finally, we find that TIOC is associated with a greater usage of unique metrics and lower similarity in metrics across the executive team, consistent with TIOC creating heterogenous activities that top managers need to monitor and manage in support of optimizing taxes. Our study contributes to the tax and managerial accounting literatures by shedding light on how firms manage TIOC via performance measurement.

Keywords: performance measurement, tax planning, organizational complexity

1. Introduction

It is well known that multinational firms engage in sophisticated tax planning strategies to minimize their tax burden. Research finds that this phenomenon has increased substantially over recent decades (Dyreng, Hanlon, Maydew, and Thornock 2017; Dyreng and Hanlon 2021). Many of these tax strategies require firms to implement complex organizational structures. While these strategies can lead to lower tax payments, they also introduce a significant amount of complexity into a firm's organizational structure. Rational decision-making firms would not undertake such tax-induced organizational complexity (hereafter, TIOC) if the benefits did not outweigh the costs. However, it is an open question as to how firms manage TIOC to ensure that these tax strategies generate value for the firm and minimize negative consequences. Because the old adage says "what gets measured, gets managed", we explore how firms alter the performance measurement of their top executives in response to tax-induced organizational complexity to encourage its appropriate management.

First, we need to define the construct of tax-induced organizational complexity (TIOC). Firms have organizational complexity for a variety of reasons. For example, organizational complexity can arise from operating in multiple industries, or needing to be present in multiple regions due to the location of inputs (e.g., raw materials and labor) or customers. In the spirit of Dyreng and Hanlon (2021), who use the term "tax planning" to refer to "any alteration of corporate activity relative to a zero-tax world," we define TIOC as the *incremental organizational complexity that would not exist in a zero-tax world*. This additional tax-induced complexity can take multiple forms. For example, firms may set up subsidiaries in tax havens, which are countries with very low tax rates and other tax attributes that are designed to appeal to foreign corporations (Hines and Rice 1994; Dharmapala and Hines 2009). Firms may then use these structures to engage

in income shifting (Dyreng and Hanlon 2021). Alternatively, firms may shift "real" economic activity (i.e., parts of their supply chain) to low tax jurisdictions to lower the tax burden associated with production or sales. Hence, while firms will exhibit varying levels of general organizational complexity even in a world without tax considerations, TIOC captures the degree in which firms are structured in multiple, spatially dispersed units for the *express purpose of optimizing taxes*.

It is important to note that our definition does not suggest that TIOC is necessarily unique relative to other sources of organizational complexity. That said, there are reasons why it is interesting to explore the consequences of tax-induced organizational complexity in particular. First, TIOC may come with a unique set of risks relative to other sources of complexity. For instance, tax authorities may uncover aggressive tax-motived income shifting under audit, which could lead to back taxes, penalties, and fines. Furthermore, other firm stakeholders, such as customers, may take a dim view of the tax planning accompanying TIOC. Some of these negative outcomes (e.g., negative audit consequences, reputational damage, logistical issues facing operations located in jurisdictions chosen mainly for tax planning purposes, etc.) may only be realized with some delay relative to the benefits (i.e., the tax savings), if at all. These characteristics may pose unique challenges to boards as they determine the performance measurement of their top executives. Second, policymakers around the world are increasingly considering tax policies that may affect firms' ability to use the tax planning strategies that create TIOC. For example, the OECD's Global Minimum Tax is aimed at limiting firms' ability to avoid taxes by shifting income to low-tax jurisdictions. If these policies are enacted, firms will likely respond by altering their tax planning strategies, which could lead to less—or perhaps more—organizational complexity.

In this study, we examine whether and how TIOC is associated with the design of performance measurement of the top executive team. We expect that TIOC likely shapes the

performance measurement of these executives because they are the individuals within the firm who are ultimately responsible for the net consequences of TIOC. Some of these executives, namely the chief financial officers, are likely directly responsible for the firm's choice of TIOC. However, others, such as the chief operating officer or top divisional officers, may be involved in managing the consequences associated with TIOC, such as the risks in operating a disperse supply chain spanning multiple jurisdictions or the reputational costs associated with TIOC-related tax planning. Furthermore, TIOC may affect the accuracy with which performance measures reflect those executives' efforts as well as the marginal product of their efforts. Thus, boards may still adjust the performance measurement of these executives even though they are not directly responsible for the firm's tax planning strategies.

We expect that TIOC is associated with several different aspects of executive performance measurement. First, TIOC may require measuring performance over a longer period, for several reasons. As noted above, the benefits from TIOC may be recognized much earlier than its risks. Furthermore, TIOC generally is associated with significant organizational decisions that include operations and supply chain management and planning (Vidal and Goetschalckx 1997; Shunko, Debo, and Gavirneni 2014; Shunko, Do, and Tsay 2017), which will come with performance expectations over a longer time horizon. Therefore, in the presence of TIOC, boards may want to measure the performance of the executives over a longer period to encourage these executives to consider its long-run consequences. Second, TIOC may lead to noise and/or bias in standard performance metrics, impairing their ability to accurately reflect executive effort. Thus, firms may need to use adjusted versions of standard metrics in the presence of greater TIOC to accurately capture managerial performance. Third, managers in firms with greater TIOC likely must manage a larger number of facets in support of the set of complex heterogenous activities aimed at

optimizing taxes. For example, operating in multiple jurisdictions entails dealing with supply chain issues, local regulations, different customer bases and/or suppliers, and other factors. Managing each of these issues comes with a different set of activities that need to take place, potentially requiring the usage of more metrics to capture as well as direct executive performance. Furthermore, these activities likely vary across the executives in the top management team, which may require different metrics to be used across these individuals.

We operationalize our TIOC construct using firms' subsidiaries in tax havens and other low-tax countries. Prior research has used U.S. firms' presence in tax havens to measure their tax planning activities (Dyreng and Lindsey 2009; Law and Mills 2015; Higgins, Omer, and Phillips 2015; Bennedsen and Zeume 2018; Gallemore, Gipper, and Maydew 2019). We expect that firms' subsidiaries in tax havens represents an aspect of organizational complexity that is highly likely to be connected to tax planning. In a similar vein, we expect that a concentration of subsidiaries in low tax jurisdictions may also reflect firms' desire to increase organizational complexity to lower their tax burden.

Our empirical TIOC proxy captures both the breadth and depth of a firm's subsidiaries in tax havens and low tax countries. To capture breadth, we consider the number of unique such jurisdictions in which the firm operates. To capture depth, we count the number of subsidiaries in such jurisdictions. We then combine these dimensions into a single measure for TIOC. This measure exhibits intuitive correlations with measures of organizational complexity such as size, foreign income, recent acquisitions, and business and geographic dispersion (e.g., Duru and Reeb 2002; Bushman, Chen, Engel, and Smith 2004; Berry, Bizjak, Lemmon, and Naveen 2006). Furthermore, consistent with both prior research (Dyreng and Hanlon 2021) and anecdotal

evidence, the components of our TIOC measure have generally increased over time. Both pieces of evidence support that our measure captures the notion of tax-induced organizational complexity.

In our analyses, we examine the association between our TIOC measure and various aspects of performance measurement for a large sample of executives of listed U.S. firms over the period from 2006 to 2019, controlling for measures of general organizational complexity and other previously documented determinants. We find that TIOC is associated with several aspects of executive performance measurement. First, we find that TIOC is positively associated with using longer periods to measure performance. This finding is consistent with boards wanting managers to balance the shorter-run benefits of TIOC (i.e., reduced tax payments) with the potential longer-run consequences (i.e., the risks associated with tax planning, and with operating a geographically dispersed organization more generally). Second, TIOC is associated with a greater usage of discretionary adjustments to performance metrics, consistent with boards addressing perceived measurement error and bias issues with commonly used metrics induced by TIOC. Third, TIOC is positively associated with the number of unique performance measures for each executive, and negatively associated with the similarity of metrics used across the top executive team, consistent with TIOC requiring executives to manage a greater number of factors which differ across the executive team. Overall, these findings are largely consistent with firms setting the performance measurement of their executives to encourage them to properly manage the benefits and consequences associated with TIOC.

We conduct three sets of tests to assess the robustness of our main inferences. First, to address concerns regarding omitted variables, we conduct an additional analysis that employs a difference-in-differences methodology in which we compare changes in performance measurement for firms that initiate TIOC (i.e., go from zero TIOC to positive TIOC) within a short

window to a control sample where TIOC remains zero. We find that these TIOC initiators alter their executive performance measurement in the same way as documented in our main findings. Second, we employ the methodology suggested by Oster (2019) to assess the sensitivity of our inferences to unobservable factors. For all but one of our analyses, we find that the Oster delta is above the benchmark of one, suggesting that omitted unobservable factors would have to be more important than the included observable factors to overturn our findings. Third, we find that our findings are robust to alternative approaches to measuring TIOC. In summary, our primary results do not appear to be not fully driven by omitted observable or unobservable factors, or the specific TIOC measurement approach that we employ in the main analyses.

We contribute to the tax literature in two ways. First, we provide evidence on the consequences of tax planning more generally, and of creating organizational complexity to achieve tax planning objectives more specifically. It is well known that multinational enterprises create complex structures to take advantage of the uncoordinated nature of international tax rules for the purpose of lowering their tax burdens (Dyreng and Hanlon 2021). That said, the consequences of using these complex structures, in particular for internal performance management systems, has received little attention in the literature. Our study provides the first evidence on how firms manage the organizational complexity underlying such tax strategies. Second, we contribute by developing a composite measure of TIOC, as opposed to exploring individual components (e.g., the number of tax haven subsidiaries). Given the prominence of these organizational structures used by large multinational enterprises, we believe that this measure is likely to be useful for future research in examining additional consequences of such complexity.

We also make several contributions to the managerial accounting literature. First, we contribute to the management accounting literature on performance measurement by documenting

how tax planning can affect the design of top executive performance measurement. The empirical literature in this area has mostly considered proprietary data on managers and employees below the executive level, while the top executive literature has focused more on compensation amounts and incentive strength rather than the actual performance metrics used.[1] Bushman (2021) points out that the value adding role of bonus plans may be in clearly laying out the set of performance metrics to communicate a firm's strategic objectives to executives, foster their accountability to these metrics, and cascade these objectives throughout the organization to promote coordination and cooperation. Second, while prior research has studied the association between CEO pay and incentives and organizational complexity more broadly, to the best of our knowledge, we are the first to hone in on a specific driver of such organizational complexity, i.e. tax planning.[2] Finally, we contribute to the very limited literature that links the management accounting topic of performance measurement to tax, as called for by Shackelford and Shevlin (2001) and Baldenius and Dyreng (2021).[3] The latter specifically call for researching the costs of complicated organizational structures set up for tax purposes, including measuring and evaluating performance and providing rewards to managers in such complicated entities.

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1 Notable exceptions are Guay, Kepler, and Tsui (2019) on performance measure choices to incentivize teamwork across the top-executive team, Bloomfield, Gipper, Kepler, and Tsui (2021) on the exclusion of costs in executive performance measures to mitigate underinvestment and to insulate new managers from prior executives' decisions, and a concurrent working paper by Albuquerque, Carter, Guo, and Lynch (2022) that develops a measure of CEO contract complexity that includes performance measure characteristics but does not find that industrial diversification is associated with contract complexity.

2 For example, Duru and Reeb (2002) find that CEO pay and the strength of CEO incentives are associated with industrial and geographical diversification. Bushman et al. (2004) find that directors', but not top 5 executives', equity incentives increase with organizational complexity as measured by product-line diversification. Black, Dikolli, and Dyreng (2014) find that CEOs receive a pay premium for multinational diversification, over and above the premium for industrial diversification, although both their pay and their pay-for-performance sensitivity is reduced when there exists a high risk for the CEO diverting firm resources for their private benefit.

3 For example, Phillips (2003) finds that the use of after-tax performance measures in business unit managers' but not CEO compensation packages result in lower effective tax rates (ETRs). In contrast, we examine how tax factors (specifically, TIOC) affects the design of performance measurement systems.

2. Hypotheses

First, we examine whether TIOC affects the horizon over which performance is measured. There are several reasons to expect that TIOC may be associated with longer-run performance measurement. Organizations that set up complex structures for tax reasons make substantial investment in such tax-induced complexity and are likely to have built this complexity up for long-term benefits. For example, opening up a manufacturing or distribution facility in a low tax country or establishing a global shared-services center are major decisions that have implications beyond tax, and also affect operations and supply chain management and planning (Irving, Kilponen, Markarian, and Klitgaard 2005). Therefore, performance expectations will be defined over a longer time horizon. Additionally, it is quite plausible that tax benefits to TIOC are recognized earlier than the costs of TIOC, such as reduced efficiency or reputational concerns. Hence, setting longer run performance measures for executives, the board can encourage managers to avoid short-termism, and instead anticipate and address these potential negative consequences. Furthermore, if there is more opportunity for managerial diversion of resources for private benefits (Black et al. 2014) in high TIOC firms, measuring performance outcomes over a longer term will make short term diversion tactics ineffective. Therefore, organizations with greater TIOC may be likely to use more long-term performance metrics. We state our first hypothesis as follows:

H1: Tax-induced organizational complexity is positively associated with the likelihood of using longer-run measurement horizons.

This hypothesis is not without tension, as some tax-planning strategies are very short-term oriented, exploiting tax-minimizing opportunities that are only available for a limited time, and could involve quickly setting up a legal structure in a tax haven with minimal number of personnel in place. Those tax-induced organizational structures are complex as well but may rapidly change

as old loopholes close and new ones open up. Therefore, performance expectations in such high TIOC firms may be more short-term.

Next, we examine whether TIOC affects whether firms adjust performance metrics to address noise and bias in metrics. Given the inherent complexity of high TIOC firms, it is unlikely that performance of top executives can be measured using standard GAAP accounting metrics. The tax planning activities implemented in TIOC firms will add noise to any commonly calculated GAAP performance metrics, particularly for those executives that are not responsible for the tax aspect of the organization. Examining non-GAAP adjustments to earnings measures used in CEO compensation, Curtis, Li, and Patrick (2021) find that boards are more likely to adjust earnings when CEOs have less control over operations and earnings are less responsive to CEO effort.[4] Additionally, GAAP performance measurement may be perceived unfair by those executives. For example, TIOC may involve income shifting out of executive's business unit or region, reducing its earnings, or it may involve a misallocation of capital relative to the zero-tax world without R&D tax credits or bonus depreciation for qualifying investments. Non-GAAP adjustments to performance metrics could undo such perceived unfairness by decoupling executive performance measurement from how firm performance is reported to investors.

Theory points out that incentive contracts often include subjective components to mitigate incentive distortions caused by imperfect objective measures (Baker, Gibbons, and Murphy 1994). Using subjective performance measures is one way in which such discretionary adjustments can be introduced (Gibbs, Merchant, Stede, and Vargus 2004). When managers are worried about unfair performance measurement of their employees (Bol 2008) or too large incentive contracting risk (Lillis, Malina, and Mundy 2022), subjective adjustments to metrics may be used to mitigate

[4] To our knowledge, there is no research that studies non-GAAP adjustments to performance measurement for other top executives.

this perceived unfairness, thereby decoupling what is reported externally to the firm from how internal performance is reported. For both reasons, we phrase our second hypothesis as follows:

H2: Tax-induced organizational complexity is positively associated with the likelihood of using adjusted financial performance metrics in performance measurement.

Again, this hypothesis is not without tension. Prior experimental research (Bol, Hecht, and Smith 2015) suggests that principals are less inclined to make subjective discretionary adjustments to compensation for the effect of a negative uncontrollable event on one agent if this creates perceptions of unfairness among other agents who are not affected by the negative event. In our examples, as income shifting and over- or underinvestment relative to a non-tax world will have winners and losers, this may imply that principals refrain from using subjective performance evaluation. Furthermore, Ittner, Larcker, and Meyer (2003)'s field study documents that subjectivity in performance measurement led managers to complain about favoritism and uncertainty in the performance criteria being used. Also, using non-GAAP performance measures for firm executives may be inconsistent with the focus of investors on the firm's GAAP measures. Lastly, Curtis et al. (2021) find some evidence that opportunistic CEOs exploit the discretion afforded by non-GAAP measures to artificially inflate their compensation.

Finally, TIOC increases the number of facets of the organization that top executives need to monitor and manage in the support of the set of heterogenous activities aimed at optimizing taxes. Holmström (1979)'s sufficient statistic result suggests that any measure that is informative about the executives' actions should be included in the contract. Furthermore, similar to firms with large multinational diversification (Black et al. 2014), executives of high TIOC firms may have more opportunities to divert resources easily for their private benefit, such as consuming perquisites or engaging in empire building. Board monitoring of multiple performance metrics for

each executive may counteract this problem. Therefore, we predict that more unique performance metrics will be used to measure executive performance. Furthermore, given that the various executives likely have different roles and responsibilities in managing the potential benefits and risks associated TIOC, TIOC may lead to different metrics being used across the executive team. Thus, we state our third hypothesis as follows:

H3: Tax-induced organizational complexity is positively associated with the number of unique performance metrics and negatively associated with the similarity in metrics used across the executive team.

This hypothesis is again not without tension. Given humans are boundedly rational, they have a hard time processing information provided by multiple different cues—in this case performance metrics (Lipe and Salterio 2000). Including multiple factors for the executive to consider in their contract increases the executive's cognitive load (Albuquerque et al. 2022). To reduce such cognitive overload and to focus executives' attention to the core aspects of running a high TIOC firm, a smaller number of common performance metrics can be used. Furthermore, TIOC may require greater coordination across the different parts of the firm. Prior research suggests that firms may use metrics common across the entire team to facilitate coordination (Guay et al. 2019). Lastly, it is well-known that the use of multiple measures may create multi-tasking concerns, whereby some tasks do not attract the required effort if performance measures across tasks have differential noise (Holmstrom and Milgrom 1991).

3. Research design

3.1. Data sources and sample

We obtain data for our analyses from several sources. Our data on executive compensation and performance measurement comes from Incentive Lab. We obtain data on firms' material subsidiaries disclosed in Exhibit 21 of the Form 10-K from WRDS.[5] We employ accounting and stock market data from Compustat and CRSP, respectively. We obtain data on business and geographic operations from the segments database from WRDS to calculate measures of business and geographic dispersion.

We describe our sample selection process in Table 1. We begin with the sample of firm-years in ISS Incentive Lab. which covers incentive grants offered to top executives, and collects performance measurement information from 2006 onwards, when listed US firms were required to start disclosing this information in the Compensation Discussion and Analysis section of their proxy statements (Gipper 2021). Our sample period extends through 2019, as this is the last year for which Incentive Lab has comprehensive data on executive compensation plans. We remove financial firms (SIC1 code of 6) and utilities (SIC2 code of 49), consistent with prior research on tax planning (e.g., Gallemore and Labro 2015). We exclude firm-years that we cannot match to Exhibit 21 data (which provides the information on material subsidiaries and their locations). We also exclude firm-years without foreign subsidiaries; these firms are primarily domestic firms and therefore unlikely to engage in the same type of tax-induced organizational complexity that is available to multinational enterprises. Finally, we require that firm-year observations have non-missing assets, positive book equity, and sufficient data to measure our control variables. This leaves us with a sample of 38,597 executive-year observations and 7,265 firm-year observations,

[5] Using proprietary data from the Internal Revenue Service, Dyreng, Hoopes, Langetieg, and Wilde (2020) show that the Exhibit 21 disclosures are highly accurate representations of material subsidiaries.

corresponding to 10,454 unique executives and 931 unique firms, spanning the period from 2006 to 2019.

3.2. Measuring tax-induced organizational complexity

To measure tax-induced organizational complexity, we focus on the firm's foreign subsidiary operations. Our focus on U.S. firms' foreign operations is motivated by the proliferation of income shifting as a major tax planning strategy over the last two decades (Dyreng and Lindsey 2009; Markle and Shackelford 2014; Dyreng and Hanlon 2021). This tax strategy necessitates U.S. parent companies having operations in tax havens or other low-tax jurisdictions. Often times, the firm needs to establish a complex set of subsidiary linkages in order to maximize the tax savings associated with this income shifting. For example, a commonly cited example of such complexity is the Double Irish with a Dutch Sandwich structure, used successfully by large companies such as Apple and Google to save billions on U.S. taxes.

We use several different component measures to capture the tax-induced complexity in a firm's foreign subsidiary structure. First, we focus on material subsidiaries in tax havens. Prior research has used U.S. firms' presence in tax havens to measure their tax planning activities (Dyreng and Lindsey 2009; Law and Mills 2015; Higgins et al. 2015; Bennedsen and Zeume 2018; Gallemore et al. 2019). We expect that subsidiaries in tax havens represents an aspect of organizational complexity that is highly likely to be connected to tax planning. We classify a country as being a tax haven following Dyreng and Lindsey (2009) where a country is defined as a haven if it is identified as a tax haven by three of the four following sources: (1) Organization for Economic Cooperation and Development, (2) the U.S. Stop Tax Havens Abuse Act, (3) The International Monetary Fund, and (4) the Tax Research Organization. We provide a list of the countries that are classified as tax havens in Appendix A. Regarding tax haven subsidiaries, we

measure both the number of such subsidiaries as well as the number of unique tax haven jurisdictions in which the firm operates. The former captures the organizational complexity arising from having more subsidiaries motivated by tax planning purposes, whereas the latter aspect captures the complexity that arises from operating in multiple different tax haven jurisdictions. In Panel A of Table 2, we present descriptive statistics on these two measures for our sample of firm-years. We find that, on average, firm-years report having approximately 11 tax haven subsidiaries across approximately four unique tax haven countries.

Second, we capture the firm's presence in non-haven yet low tax countries. While prior literature has focused on tax havens, we believe that operating in low tax countries that do not necessarily meet the agreed-upon definition of tax havens may also indicate that the firm has developed organizational complexity for the purpose of minimizing its tax burden. We define a country as being a non-haven low tax jurisdiction if the country has a tax rate less than or equal to 20 percent (which represents the bottom quartile of statutory tax rates for non-haven countries across our entire sample period; the average tax rate in countries classified as low-tax is 13.5%) in each sample year but is not classified as a haven according to the criteria described above.[6] Again, we provide a list of these countries in Appendix A. Similar to the tax haven measures above, we measure both the number of subsidiaries that firms have in these non-haven low tax countries as well as the number of unique non-haven low tax countries in which the firm has a material subsidiary. In Panel A of Table 2, we present descriptive statistics on the low tax country measures for our sample of firm-years. We find that, on average, firm-years report having approximately almost three low tax subsidiaries across approximately 1.5 low tax countries.

[6] We use a fixed list of low tax countries because using a time-varying list would lead to year-to-year changes in tax-induced organizational complexity without the firm actually changing the location of its subsidiaries.

To combine these into a single measure of tax-induced organizational complexity, we assign each firm a yearly rank for each of the four component measures. For component measures with values of zero, the rank is set to zero. Then, the remaining non-zero measures are sorted into quartiles (ranging from 1 to 4). The ranks for the four component measures are then averaged to create a composite measure that ranges between zero and four for each firm-year. We label this combined measure *TIOC*, which captures the firm's level of tax-induced organizational complexity relative to other firms in that year. Appendix B contains all variable definitions.

While we primary rely on both institutional details and prior literature to support our approach to measuring TIOC, we also take a few steps to validate our proxy. First, we examine how the components of our measure have evolved over our sample period (2006 to 2019). Conventional wisdom suggests that firms have increased the amount of organizational complexity in order to minimize their tax burden substantially over time. In Figure 1, we plot the yearly sample means of the four different component variables (*Haven Subs*, *Haven Countries*, *Low Tax Subs*, and *Low Tax Countries*) over our sample period. In this Figure, we focus on a constant sample of firms (i.e., firms that have with sufficient data to enter our regression sample every year of our sample period) to ensure that changes are not due to shifts in sample composition. Figure 1 shows that the four different components of *TIOC* have increased over our sample period. The two tax haven measures appear to peak around the Tax Cuts and Jobs Act of 2017 ("TCJA"), which potentially curbed the returns to aggressive income shifting by substantially reducing the U.S. statutory corporate income tax rate from 35 percent to 21 percent. However, we find that the usage of subsidiaries in low tax countries continues to increase even after the TCJA.

Additionally, we examine the correlations (i) between the individual *TIOC* components and (ii) the differences in several firm-level characteristics—in particular, measures of general

organizational complexity—between firm-years with high and low values for our *TIOC* composite measure. We report these correlations in Panel B and C of Table 2, respectively. First, we find that our four component measures are highly correlated with one another, consistent with them capturing a singular construct related to tax-induced organizational complexity. Second, we find that firm-years with higher values of our composite *TIOC* measure also exhibit higher non-tax induced organizational complexity measured by business and geographic complexity based on segment sales, as used in prior research (e.g., Duru and Reeb 2002; Bushman et al. 2004; Berry et al. 2006), size, foreign income, acquisitions and restructuring expense.[7] We also find that these firm-years report higher UTB balances than firm-years with lower *TIOC* values, consistent TIOC leading firms to incur greater tax avoidance risk.

3.3. Performance measurement characteristics

We examine several different executive performance measurement characteristics using Incentive Lab data. We begin with all grants (the GpbaGrant table from Incentive Lab includes both equity and non-equity grants) and match each grant to its corresponding relative and absolute performance metrics (Incentive Lab tables GpbaAbs and GpbaRel). We drop observations that are missing metric information (i.e., when both Incentive Lab variables 'metric' and 'metrictype' are missing).

To test the first hypothesis, we employ *Long Term Metric Indicator* and *Long Term Metric Ratio*. *Long Term Metric Indicator* is an indicator variable equal to one if an executive-year has at least one performance metric that is measured over a period longer than twelve months. We use the Incentive Lab variable "Vest High" which measures the end of the performance period in

[7] We define these complexity measures in Appendix B.

months from the grant date. *Long Term Metric Ratio* is the ratio of performance metrics that are longer than twelve months to total performance metrics in an executive-year.

To test the second hypothesis, we employ *Adjusted Metric Indicator* and *Adjusted Metric Ratio*. *Adjusted Metric Indicator* is an indicator variable equal to one if an executive-year has at least one performance metric that is described as "adjusted" or "non-GAAP" according to Incentive Lab variables 'metric', 'metrictype', or 'metricother.' *Adjusted Metric Ratio* is the ratio of performance metrics that are described as "adjusted" or "non-GAAP" to total performance metrics in an executive-year.

To test the third hypothesis, we employ *Unique Metrics*, *Metric Similarity*, and *Perfect Metric Similarity*. *Unique Metrics* is an executive-year level variable equal to the natural log of one plus the number of unique performance metrics. *Metric Similarity* is the mean pairwise metric similarity of all named executives in a firm-year, where metric similarity is the proportion of common metrics between two executives. *Perfect Metric Similarity* is an indicator variable equal to one for firm-years where *Metric Similarity* equals one, indicating firm-years where all named executives are measured on the same metrics. *Metric Similarity* and *Perfect Metric Similarity* are firm-year level variables. For each of these variables, we define unique performance metrics as a combination of metric and performance period. For example, earnings measured over 12 months and 36 months would count as two unique performance metrics in an executive-year. Metrics described as "Individual" are considered unique to each executive (i.e., an individual metric for each of the 5 named executives counts as five unique metrics across the executive team). We provide examples of how these variables are created in Appendix C.

3.4. Regression

To test our hypotheses, we estimate variations of the following regression at either the firm-year *i,t* or executive-year *j,t* level:

$$MetricProxy_{i,t\ or\ j,t} = TIOC_{i,t} + \sum_m Firm\ Controls_{i,t-1} + \sum_n Exec\ Controls_{j,t} + \varepsilon_{i,t\ or\ j,t} \quad (1)$$

The dependent variable *MetricProxy* is equal to one of our performance measurement characteristics (*Long Term Metric Indicator*, *Long Term Metric Ratio, Adjusted Metric Indicator*, *Adjusted Metric Ratio*, *Unique Metrics*, *Metric Similarity*, and *Perfect Metric Similarity*) as described in section 3.3. The primary independent variable is *TIOC*, which takes on a value of zero to four as described in section 3.2. Higher values of *TIOC* indicate greater tax-induced organizational complexity.

We include two sets of firm-level control variables, all measured at time t-1 (i.e., prior to the design of the contract). First, we account for non-tax-induced organizational complexity, as prior research finds that organizational complexity is generally associated with executive compensation and contract design (Bushman et al. 2004; Duru and Reeb 2002), and firms with greater TIOC may also have organizational complexity for non-tax reasons. Thus, we include a vector of control variables that captures non-tax induced sources of organizational complexity: *Size*, *Business Dispersion*, *Geographic Dispersion*, *Foreign Income*, *Acquisitions*, and *Restructuring*. *Size* is measured as the natural log of market value of equity; larger firms are generally more organizationally complex. Prior research also accounts for organizational complexity using segment dispersion (Bushman et al. 2004; Duru and Reeb 2002), and thus we include *Business* (*Geographic) Dispersion*, which is the sum of the squares of firm sales in each business (geographic) segment divided by total firm sales, minus one and then multiplied by negative one. We additionally include *Foreign Income* (measured as foreign income scaled by

sales) to account for the firm's general scope of foreign operations. We include *Acquisitions* (acquisition expenses scaled by sales) and *Restructuring* (an indicator variable equal to one if the firm has a non-zero restructuring expense, zero otherwise), as acquisitions and restructuring of existing operations are likely associated with changes in organizational complexity.

Our second vector of control variables captures other firm-level characteristics that likely influence the design of performance measurement: *MTB*, *R&D*, *Missing R&D* and *Return Volatility*. We include the market-to-book ratio (*MTB*), measured as the market value of equity scaled by the book value of equity, to account for the firm's growth opportunities, which likely influence contract design. We control for research and development expenditures (*R&D*), as TIOC may be correlated with intangible asset use and because prior research has shown that firms with more intangible assets may make more non-GAAP adjustments to performance metrics (Curtis et al. 2021). Because missing values for R&D are filled in with zeroes in Compustat, we also include an indicator equal to 1 for firm-years with missing R&D values (*Missing R&D*) to account for any systematic relation with performance measurement for firms that do not report R&D expenses (Koh and Reeb 2015). To capture firm-level volatility, we control for *Return Volatility* (measured as the natural log of the standard deviation of monthly stock returns over the prior 24 months).

For tests conducted at the executive level, we also include an indicator variable equal to one for executives older than 65 years (*Retire)* as performance measurement of executives likely changes as they approach retirement age (Albuquerque et al. 2022). All our analyses include industry-year fixed effects, where industry is defined at the two-digit SIC industry level to control for TIOC and performance measurement choices driven by industry, and our executive-level analyses additionally include executive type (e.g., CEO, CFO, Chairman, etc.) fixed effects to control for performance measurement choices that may be common across specific types of

executives. We cluster standard errors at the firm-level since our *TIOC* measure is defined at the firm-level. In robustness analyses, we also re-run all our main firm- and executive-level analyses reported on in Section 4 with lagged TIOC.

4. Results

4.1. Length of performance measurement period

First, we examine whether tax-induced organizational complexity is associated with the length of the period over which firms measure performance (Hypothesis 1). As discussed in section 2, we expect that firms with greater tax-induced organizational complexity are more likely to measure financial performance over an extended window. This is because (a) the complex structures required for such tax planning likely to require substantial long-run investment and (b) the costs to TIOC (such as reputational concerns or managerial diversion) may only be realized with some delay, and thus longer performance measurement is required to force managers to internalize the potential costs of greater tax-induced organizational complexity.

In Table 4, we report the results of estimating equation 1 using either *Long Term Metric Indicator* or *Long Term Metric Ratio* as the dependent variable. We first estimate the equation without any fixed effects or control variables in column 1. Then in column 2 (3), we add in industry-year fixed effects (control variables and fixed effects). We find significant positive coefficients on *TIOC* in each specification, consistent with our prediction that this type of complexity induces firm to extend the window over which it evaluates performance. These results suggest that a one within fixed effects standard deviation increase in TIOC is associated with a 3.7 percent increase in the likelihood of being measured with at least one long term metric and a 4.6

percent increase in the ratio of long-term metrics for the average executive, relative to the sample means over each variable.[8]

Given that that firms choose both the level of tax-induced organizational complexity and the design of the executive compensation contract, our findings could be subject to omitted variable bias. While we control for likely first-order determinants of performance measurement design, we further assess the sensitivity of our findings to unobservable omitted variables using the approach developed by Oster (2019). Specifically, we calculate the Oster delta, which is the relative importance of unobservable factors to observable factors that would be required to eliminate the documented effect.[9] We find that the Oster deltas for these analyses are 1.02 (*Long Term Metric Indicator*) and 1.32 (*Long Term Metric Ratio*), suggesting that omitted unobservable factors would have to as (or more) important than the included observable factors to overturn these findings, which we view as unlikely given our extensive set of control variables. Furthermore, this value is above the benchmark of one suggested by Oster (2019).

4.2. Adjusted metrics

Next, we examine whether tax-induced organizational complexity is associated with whether firms used adjusted (or non-GAAP) measures in evaluating executive performance (Hypothesis 2). As discussed in section 2, we expect that the income shifting and other tax planning strategies associated with tax-induced organizational complexity add noise to common GAAP measures of performance, rendering them less useful for measuring managerial effort. Therefore,

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[8] These values are calculated respectively as the coefficient on TIOC from column 3 (column 6) of Table 4 times the within fixed effects standard deviation of TIOC (1.15) divided by the mean of *Long Term Indicator* (*Long Term Ratio*) from Table 3 ((0.0198 x 1.15)/0.62) and ((0.0105 x 1.15)/0.26).

[9] To calculate the Oster delta, we need to assume a R-squared (R(max)) from a hypothetical regression of the dependent variable on both observable and unobservable factors. We set the R(max) as 1.3 times the R-squared from the "controlled" regression as suggested by Oster (2019).

we predict that firms with greater tax-induced organizational complexity are more likely to adjust common financial accounting measures when employing them in compensation contracts.

To test this hypothesis, we estimate equation 1 using either *Adjusted Metric Indicator* or *Adjusted Metric Ratio* as the dependent variable. We report these findings in Table 5. We find significant positive coefficients on *TIOC* in each specification, consistent with our prediction that this complexity induces firm to adjust GAAP measures when evaluating executive performance. These results suggest that a one within fixed effects standard deviation increase in TIOC is associated with a 10.5 percent increase in the likelihood of being measured with an adjusted metric and a 8.1 percent increase in the ratio of adjusted metrics for the average executive, relative to the sample means for each variable.[10] We find that the Oster deltas for these analyses are 2.56 (*Adjusted Metric Indicator*) and 2.39 (*Adjusted Metric Ratio*), suggesting that the unobservable factors would have to be several times more important than the observable factors in explaining variation in our dependent variables to overturn our findings. Again, both values are above the benchmark of one suggested by Oster (2019).

Ideally, we would examine the specific adjustments that firms make in response to TIOC. Unfortunately, the IncentiveLab data does not provide sufficient information on the actual adjustments being made by firms. Thus, to shed further light on these adjustments, we employ data from Curtis et al. (2021), who hand collect information on such adjustments from the 2013 proxy statements for a large sample of CEOs, and classify these adjustments into twenty different types (and an additional "other" category). Because the authors read each individual proxy statement, the data is highly accurate, detailed, and well-suited to an exploratory analysis of the specific types

[10] These values are calculated respectively as the coefficient on TIOC from column 3 (column 6) of Table 5 times the within fixed effects standard deviation of TIOC divided by the mean of *Adjusted Metrics Indicator* (*Adjusted Metrics Ratio*) from Table 3 ((0.0265 x 1.15)/0.29) and ((0.00774 x 1.15)/0.11).

of adjustments made to performance measures by high TIOC firms. We are able to match our data to 463 of their 800 firm observations in 2013.

Using this sample, we conduct an exploratory analysis to understand the specific adjustments firms make to performance metrics in response to TIOC. We estimate a univariate regression, where the dependent variable is one of a vector of indicator variables, one for each of the different types of adjustments in the Curtis et al. (2021) classification, and the sole independent variable is *TIOC*. We also run multivariate regressions where we include all our time-varying control variables from equation 1. We report the results from the regressions in which we observe a statistically significant coefficient on *TIOC* in Table 6 in the univariate and/or multivariate specifications. These findings indicate that *TIOC* is associated with performance measurement adjustments related to acquisitions, restructuring, impairment, acquired intangibles, foreign currency and other uncategorized factors.[11]

We acknowledge that there are limitations to this analysis. Specifically, the fact that we are limited to a single cross-section of data prevents us from using alternative research designs, such as the usage of certain fixed effects, that could help us to better attribute to the usage of these adjustments to TIOC, as opposed to other factors.[12] That said, this analysis is descriptively useful in understanding which types of adjustments appear to be associated with TIOC.

4.3. Unique metrics

Next, we examine whether tax-induced organizational complexity is associated with the number of unique metrics used in the compensation contracts of the top executives. As predicted

[11] The categories of adjustments in Curtis et al. (2021) that we find are not significantly related to TIOC are: undisclosed, gain or loss, settlement, write-down, debt extinguishment, in-process R&D, mark-to-market, regulatory change, capital charge, pension, accounting method change, taxes, R&D, stock compensation and discontinued operations.

[12] In untabulated analyses, we find that four of the six effects documented in Table 6 are robust to the inclusion of one-digit SIC code fixed effects (in addition to the time-varying firm-level controls).

in Hypothesis 3, we expect that tax-induced organizational complexity leads firms to increase the number of unique measures used in evaluating executive performance. We report the results of estimating equation 1 with *Unique Metrics* as the dependent variable in Table 7. We find a significant and positive coefficient on *TIOC* across each of the three specifications, consistent with tax-induced organizational complexity being associated with a greater use of unique performance metrics because of the multiple facets that top managers need to monitor and manage in the support of the set of heterogenous activities aimed at optimizing taxes. These results suggest that a one within fixed effects standard deviation increase in TIOC is associated with a 2.1 percent increase in the number of unique metrics used for the average executive.[13] We find that the Oster delta in this analysis is 0.96, which is slightly below the benchmark of one suggested by Oster (2019), but still suggests that omitted unobservable factors would have to be almost as important than the included observable factors to overturn these findings.

4.4. Metric similarity

Last, we examine whether tax-induced organizational complexity is associated with the similarity of metrics used across the executive team. As suggested by Hypothesis 3, we predict that tax-induced organizational complexity will require a more complex set of measures that will vary across the executive team, and thus TIOC should be associated with less metric similarity. We re-estimate equation 1 using either *Metric Similarity* or *Perfect Metric Similarity* as the dependent variable and report these findings in Table 8. We find a negative and significant coefficient on *TIOC* across four of the six specifications, suggesting that TIOC is associated with more differentiated metric usage across the management team, consistent with our expectations. Our results suggest that a one within fixed effects standard deviation increase in TIOC is associated

[13] This is calculated as the coefficient on *TIOC* in column 3 of Table 7 times the within fixed effects standard deviation of TIOC (0.0179 x 1.15).

with a 2.8 percent reduction in *Metric Similarity* across the executive team and an 9.2 percent reduction in the likelihood that all executives are measured with the same set of metrics, relative to the sample mean of each variable.[14] We also report the Oster deltas, which are -7 (*Metric Similarity*) and 5 (*Perfect Metric Similarity*). The former is negative because the result becomes stronger statistically once we control for observable factors, and the latter is well above the benchmark of one suggested by Oster (2019); both values suggest that omitted unobservable factors are unlikely to overturn these findings.

5. Additional analyses

5.1. Difference-in-differences approach

To further mitigate concerns about correlated omitted variables driving our findings, we examine the robustness of our primary findings to an alternative research design in which we compare changes in executive performance measurement for firms that initiate TIOC within a short period of time relative to a sample of control firms, using a difference-in-differences methodology. The idea behind this approach is that focusing on performance measurement changes in a short period of time after the initiation of TIOC allows us to better attribute any changes to the change in TIOC, as opposed to other factors.

To identify firms that are initiating TIOC, we focus on firms that go from having zero TIOC to positive TIOC. Specifically, we define *New TIOC* as an indicator variable equal to one if the firm has a TIOC value of zero in both years t-2 and t-1, and then has a positive value of TIOC in year t. If a firm has multiple such increases during our sample period, we only employ the first

[14] The reduction in *Metric Similarity* is calculated as the coefficient on *TIOC* in column 3 of Table 8 (-0.0147) times the within fixed effect standard deviation of *TIOC* (1.16), divided by the mean of *Metric Similarity* from Table 3 (0.6). The decreased likelihood of *Perfect Metric Similarity* is calculated similarly using the coefficient on *TIOC* in column 6 of table 8 ((-.0231 x 1.16)/0.29).

instance. For these *New TIOC* firms, we focus on a sample period that includes three years prior to the TIOC initiation, and three years afterward (inclusive of year t).[15] Our sample of controls includes firms that maintain a TIOC level of zero throughout this sample window. Since our approach is effectively a staggered difference-in-differences methodology, we implement a stacked cohort design (Barrios 2021; Cengiz, Dube, Lindner, and Zipperer 2019), which creates separate cohorts for each treatment sample (i.e., a set of firms that go from TIOC = 0 to TIOC > 0 in a given year). Each cohort is comprised of both the treatment firms and control firms, the latter of which have zero TIOC throughout the treatment window.

Using this sample, we estimate the following difference-in-differences regression:

$$MetricProxy_{i,t\ or\ j,t} = New\ TIOC\ \times\ Post_{i,t} + \sum_m Controls_{i,j,t-1} + FE + \varepsilon_{i,t\ or\ j,t} \quad (2)$$

The dependent variable, *MetricProxy*, is one of the performance measurement variables described in section 3.3. Our variable of interest is the interaction of *New TIOC* (the indicator variable described above), and *Post*, which is an indicator equal to one if the year is in the "post" period (i.e., years t, t+1, or t+2) for either the *New TIOC* firm or the control firm. Thus, the coefficient on this interaction term represents differential change in *MetricProxy* for the *New TIOC* firms relative to the control firms after the former's TIOC initiation. We include the time-varying control variables from equation 1, as well as several types of fixed effects: firm and cohort-year (akin to event-time) fixed effects in the firm-level tests, and firm, cohort-year, industry-year, and executive type fixed effects in the executive-level tests. We cluster standard errors at the firm-level.

We report the results from this analysis in Table 9. In Panel A, we report the results from estimating equation 2 for the executive-level outcomes (*Long Term Metric Indicator*, *Long Term*

[15] That is, the sample window includes years t-3 to t-1 as the "pre" period and years t to t+2 as the "post" period.

Metric Ratio, *Adjusted Metric Indicator*, *Adjusted Metric Ratio*, and *Unique Metrics*). For all of the outcomes, we find a positive and significant coefficient on *New TIOC x Post*. These findings indicate that *New TIOC* firms are more likely to use longer-run measurement periods and adjusted metrics, and increase the usage of unique metrics after the increase in TIOC relative to the control sample; these findings are consistent with those reported in Tables 4, 5, and 7.[16] In Panel B, we report the results from estimating equation 2 using the firm-level outcomes (*Metric Similarity* and *Perfect Metric Similarity*). For both measures, we find a negative coefficient on *New TIOC x Post*, but only the coefficient on *Perfect Metric Similarity* is significant at the 5% level. These findings suggest that initiating TIOC leads to reduced similarity in the metrics used across the executive team and are consistent with the findings from Table 8.

Interpreting the difference-in-differences coefficient as the causal effect of TIOC on executive performance measurement relies on the assumption of parallel trends; that is, that the *New TIOC* firms and control firms would have exhibited similar patterns in executive performance measure but for the treatment. While this assumption is not explicitly testable, we shed light on its plausibility by examining the differences between performance measurement dynamics of our *New TIOC* firms and control firms. Specifically, we estimate a modified version of equation 2 in which we replace *Post* with event-time indicators for each year in the window (i.e., t-3, t-2, etc.), omitting the indicator for year t-1 to serve as the base period. We plot these coefficient estimates in Figure 2 for each of the performance measurement proxies. For the five executive-level dependent variables (*Long Term Metric Indicator*, *Long Term Metric Ratio*, *Adjusted Metric Indicator*, *Adjusted Metric Ratio*, and *Unique Metrics*), we do not observe any noticeable pre-treatment differences in trends between our *New TIOC* firms and control firms: the coefficients before year

[16] In untabulated analyses, we find that our inferences are similar if we instead use a larger (i.e., +/- five years) or shorter (i.e., +/- two years) window around the TIOC increase year.

t are generally close to zero and statistically insignificant. We believe that these findings generally suggest that the parallel trends assumption is plausible. Furthermore, we generally observe an economically and statistically significant increase in these coefficients beginning in year t, consistent with firms altering their performance measurement approach after the TIOC increase. For the two firm-level metrics (*Metric Similarity* and *Perfect Metric Similarity*), we do observe a slight pre-event difference in trends—albeit statistically insignificant—between our *New TIOC* firms and control firms, which suggests that the parallel trends assumption might not be plausible for these two measures; the results in Panel B of Table 9 should be interpreted with this caveat in mind.

Collectively, the findings in Table 9 and Figure 2 suggest that firms alter their approach to measuring executive performance after initiating TIOC. We believe that the findings from this difference-in-differences methodology corroborate the findings in Tables 4, 5 and 7.

5.2. Alternative TIOC measures

In our final set of analyses, we examine the robustness of our primary findings to alternative definitions of our *TIOC* proxy. In our primary composite measure of TIOC, we first assign component values (haven subs, haven countries, non-haven low tax subs, non-haven low tax countries) of 0 to a quartile rank of 0 before assigning the remaining non-zero observations into quartiles by year. In our first alternative TIOC measure, we omit the separation of zero and non-zero observations and simply assign all component values to quartiles by year. The quartile rank of each component is then summed and divided by 16 (4 component measures times 4 possible quartiles) to yield a composite TIOC measure that lies between 0 and 1 (*TIOC Quartiles*). The next alternative TIOC measure (*TIOC Quintiles*) follows this same procedure except yearly component observations are sorted into quintiles instead of quartiles, summed, and then divided by 20 (4

components times 5 possible quintiles) to yield a composite TIOC measure that lies between 0 and 1. The remaining tests examine the four component measures themselves as an independent variable. Each count measure (number of haven subs, number of unique haven countries in which a firm operates, number of non-haven low tax subs, number of unique non-haven low tax countries in which a firm operates) is transformed by adding one and taking the natural log.

For each of the six alternative approaches, we re-estimate each of our analyses from Tables 4, 5 and 7 (seven dependent variables in total). We report these findings in Table 10, with the executive-level (firm-level) results in Panel A (B). We find that 35 out of the 42 coefficients on the alternative *TIOC* approaches are statistically significant with the predicted sign, whereas seven coefficients have the expected sign but are not significant at conventional levels. These results suggest that our primary findings are robust to alternative approaches to measuring TIOC.

5.3. Other robustness analyses

In an additional, untabulated robustness test, we re-estimate a modified version of equation 1 for each dependent variable in which we measure TIOC with an additional lag (i.e., in year t-1). The purpose of this test is twofold. First, it can mitigate reverse causality concerns (i.e., the idea that the performance measurement approach induces the firm to change its organizational complexity). Second, compensation contracts may take some time to adjust to changes in TIOC, which would be better captured with the lag. All of our results remain statistically significant at the 10% or higher level.

6. Conclusion

In this study, we examine the role of tax-induced organizational complexity in executive performance measurement. We develop an approach to measuring tax-induced organizational complexity (TIOC) using firms' subsidiary networks in tax havens and other low tax countries.

Using this measure, we document several interesting findings. First, we find that firms with greater TIOC are more likely to measure performance over longer periods to counteract short termism, consistent with TIOC requiring long-term shifts in strategy and operations, and with boards wanting managers to balance the benefits of TIOC (e.g., lower tax payments) which may be more short-run, with the potential costs (e.g., reputational damage, logistical problems in the supply chain associated with locating in jurisdictions that are primarily desirable from a tax planning perspective) which may only be realized with some delay. Second, we find that firms with greater TIOC are more likely to employ non-GAAP metrics in performance measurement, suggesting that TIOC (and its associated tax planning activities) likely adds noise and bias to commonly used metrics, particularly for those executives that are not responsible for the tax aspect of the organization, and thus the adjustments are necessary to shield these executives from TIOC's effect. Finally, we find that firms with higher TIOC are more likely to use multiple unique metrics and have dissimilar metric combinations across their executive team, consistent with TIOC requiring executives to monitor and manage multiple facts of the organization.

Our findings contribute to the tax and managerial accounting literatures in several ways. First, while the usage of complex organizational structures by multinational firms to minimize taxes is relatively well-known, we provide initial empirical evidence on the consequences of these complex structures for internal performance management systems. Second, we contribute to the management accounting literature by providing some of the first empirical evidence on the tax-related determinants of executive performance measures. In doing so, our study answers the call in Shackelford and Shevlin (2001) and Baldenius and Dyreng (2021) to research issues at the intersection of tax and managerial accounting, and specifically the cost of setting up complicated organizational structures for tax purposes. Finally, we contribute by developing a measure of tax-

induced organizational complexity which can be used by future research to measure other determinants and consequences of such complexity.

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Appendix A: Haven and Low Tax Countries

Haven Countries		Low Tax Countries
Andorra	Luxembourg	Afghanistan
Anguilla	Macao	Albania
Antigua and Barbuda	Maldives	Armenia
Aruba	Malta	Bosnia and Herzegovina
Bahamas	Marshall Islands	Bulgaria
Bahrain	Mauritius	Cambodia
Barbados	Monaco	Croatia
Belize	Montserrat	Faroe Islands
Bermuda	Nauru	Georgia
Botswana	Netherlands	Hong Kong
British Virgin Islands	Panama	Hungary
Brunei Darussalam	Saint Kitts and Nevis	Iceland
Cabo Verde	Saint Lucia	Iraq
Cayman Islands	Saint Vincent and the Grenadines	Kyrgyzstan
Cook Islands	Samoa	Lithuania
Costa Rica	Seychelles	Macedonia
Cyprus	Singapore	Montenegro
Dominica	Switzerland	Oman
Gibraltar	US Virgin Islands	Paraguay
Grenada	Uruguay	Poland
Guernsey	Vanuatu	Republic of Moldova
Ireland		Romania
Isle of Man		Saudi Arabia
Jersey		Serbia
Latvia		Turkmenistan
Lebanon		Turks and Caicos Islands
Liberia		United Arab Emirates
Liechtenstein		Uzbekistan

Appendix B: Variable definitions

All variables are defined below. The relevant Incentive Lab or Compustat variables are indicated in italics.

Variable Name	Definition
TIOC Measures	
TIOC	Composite measure based on four components: number of haven subsidiaries, number of unique haven countries in which a firm operates, number of low-tax subsidiaries and number of low-tax countries in which a firm operates. Each component (defined below) is sorted into quartiles by sample year after component values of 0 are assigned a quartile rank of 0. The quartile rank for each component is then averaged to yield a measure of TIOC that lies between 0 and 4.
TIOC Quartiles	Composite measure based on four components: number of haven subsidiaries, number of unique haven countries in which a firm operates, number of low-tax subsidiaries and number of low-tax countries in which a firm operates. Each component is sorted into quartiles by sample year. The quartile rank of each component is then summed and divided by 16 (4 components times 4 quartiles) to yield a firm-year composite measure of TIOC that lies between 0 and 1.
TIOC Quintiles	Same as above except annual component measures are sorted into quintiles instead of quartiles. The quintile rank of each component is then summed and divided by 20 (4 components times 5 quintiles) to yield a firm-year composite measure of TIOC that lies between 0 and 1.
Haven Subs	Number of subsidiaries in haven countries, where haven countries are defined as those that appear on 3 of 4 haven lists from the Global Policy Forum, per Dyreng Lindsey (2009)
Haven Countries	Number of unique haven countries in which a firm has subsidiaries, where haven countries are defined as those that appear on 3 of 4 haven lists from the Global Policy Forum, per Dyreng Lindsey (2009)
Low Tax Subs	Number of subsidiaries in low tax countries, where low tax is defined as a non-haven country with a statutory tax rate less than or equal to 20% throughout the entire sample period
Low Tax Countries	Number of unique low tax countries in which a firm has subsidiaries, where low tax is defined as a non-haven country with a statutory tax rate less than or equal to 20% throughout the entire sample period
New TIOC	Indicator equal to 1 for firms that have TIOC = 0 in years t-2 and t-1, and TIOC > 0 in year t

Performance Measurement Variables	
Long Term Metrics Indicator	Indicator equal to 1 if an executive-year has at least one performance metrics that is longer than 12 months; 0 otherwise (*vesthigh*)
Long Term Metrics Ratio	Ratio of performance metrics that are longer than 12 months to total performance metrics in an executive-year (*vesthigh*)
Adjusted Metrics Indicator	Indicator equal to 1 if an executive-year has at least one performance metric that is described as "Adjusted" or "Non-GAAP" according to Incentive Lab (*metric*, *metrictype*, or *metricother* contains the word "adjusted", "non-GAAP", or any variant thereof)
Unique Metrics	Natural log of one plus the number of unique performance metrics in an executive-year, where a unique metric is defined as the combination of metric (*metric* or *metrictype* if the former is missing) and performance period (*vesthigh*); metrics labeled as "Individual" are considered unique to each executive
Adjusted Metrics Ratio	Ratio of performance metrics that are described as "Adjusted" or "Non-GAAP" to total performance metrics in an executive-year (*metric*, *metrictype*, or *metricother* contains the word "adjusted", "non-GAAP", or any variant thereof)
Metric Similarity	Mean pairwise metric similarity of all named executives in a firm-year, where metric similarity is the proportion of common metrics between two executives, i.e. the number of common metrics between a pair of executives divided by the total number of unique performance metrics across the executive team; unique metrics are defined below
Perfect Metric Similarity	Indicator equal to 1 for firm-years with *Metric Similarity* equal to 1

Organizational Complexity Control Variables	
Size	Natural log of market value of equity at time t-1 *((prc * shrout)/1000)*
Business Dispersion	Sum of the squares of (firm sales in each business segment / total firm sales) minus one, then multiplied by negative one at time t-1
Geographic Dispersion	Sum of the squares of (firm sales in each geographic segment / total firm sales) minus one, then multiplied by negative one at time t-1
Foreign Income	Foreign income divided by sales at time t-1 *(pifo/sale)*
Acquisitions	Acquisition expenses divided by sales at time t-1 *(aqc/sale)*
Restructuring Expense	Restructuring costs divided by sales at time t-1 (*rcp*/*sale*)
Other Control Variables	
MTB	Average market value of equity, divided by average common equity ((*prc***shrout*)/1000)/*ceq*)
R&D	Research and development expenses, divided by sales at time t-1 *(xrd/sale);* missing values are set to 0
Missing R&D	Indicator equal to 1 if R&D expenses are missing in Compustat *(xrd)*
Stock Return Volatility	Natural log of the standard deviation of monthly stock returns over the 24 months leading to the start of year t-1
Retire	Indicator variable equal to 1 if the executive is older than 65 in year t

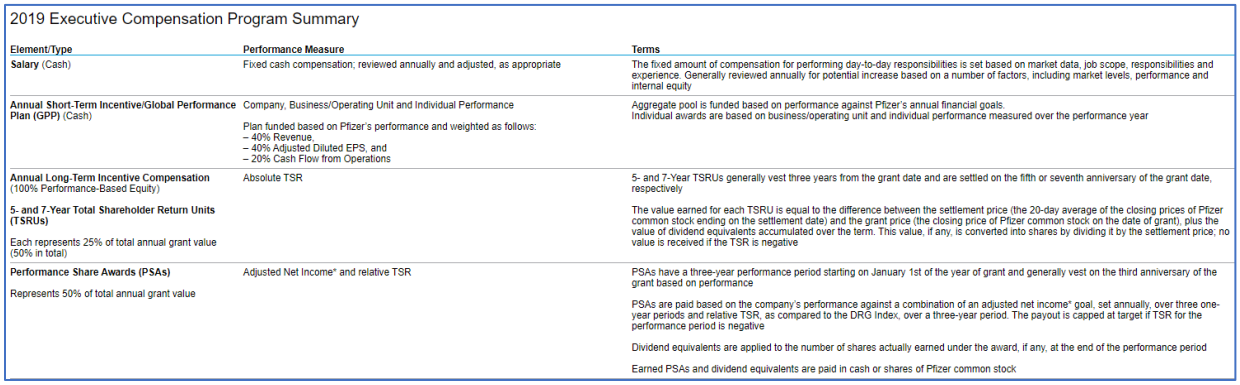
Appendix C: Example calculations for performance measurement characteristics

Example 1: Pfizer (2019)

This example shows the coding of long term and unique metrics, as well as an example proxy statement from which Incentive Lab draws the data. Long term is based on the Incentive Lab variable "Vest High", which is the performance period end measured in months from the grant date. We code a metric as long term if it is longer than the average performance period of 12 months. Unique metrics are based on a combination of metric and performance period.

Executive	Metric	Vest High	Long term metric?	Long term ratio	Unique metrics
1	Gross revenues	12	no	3 / 6 = 0.5	5
	Adjusted diluted EPS	12	no		
	Cashflow from operations	12	no		
	Adjusted net income	34	yes		
	TSR	34	yes		
	TSR	34	yes		
2	Gross revenues	12	no	3 / 6 = 0.5	5
	Adjusted diluted EPS	12	no		
	Cashflow from operations	12	no		
	Adjusted net income	34	yes		
	TSR	34	yes		
	TSR	34	yes		
3	Gross revenues	12	no	3 / 6 = 0.5	5
	Adjusted diluted EPS	12	no		
	Cashflow from operations	12	no		
	Adjusted net income	34	yes		
	TSR	34	yes		
	TSR	34	yes		
4	Gross revenues	12	no	3 / 6 = 0.5	5
	Adjusted diluted EPS	12	no		
	Cashflow from operations	12	no		
	Adjusted net income	34	yes		
	TSR	34	yes		
	TSR	34	yes		
5	Gross revenues	12	no	3 / 6 = 0.5	5
	Adjusted diluted EPS	12	no		
	Cashflow from operations	12	no		
	Adjusted net income	34	yes		
	TSR	34	yes		
	TSR	34	yes		

The figure below shows an excerpt from the proxy statement on which the above Incentive Lab coding is based. Incentive Lab includes two metrics labeled TSR because executives are measured on both absolute and relative total shareholder return. Therefore, each executive has six total metrics and five unique metrics in their compensation plan.



2019 Executive Compensation Program Summary

Element/Type	Performance Measure	Terms
Salary (Cash)	Fixed cash compensation; reviewed annually and adjusted, as appropriate	The fixed amount of compensation for performing day-to-day responsibilities is set based on market data, job scope, responsibilities and experience. Generally reviewed annually for potential increase based on a number of factors, including market levels, performance and internal equity
Annual Short-Term Incentive/Global Performance Plan (GPP) (Cash)	Company, Business/Operating Unit and Individual Performance Plan funded based on Pfizer's performance and weighted as follows: – 40% Revenue, – 40% Adjusted Diluted EPS, and – 20% Cash Flow from Operations	Aggregate pool is funded based on performance against Pfizer's annual financial goals. Individual awards are based on business/operating unit and individual performance measured over the performance year
Annual Long-Term Incentive Compensation (100% Performance-Based Equity) **5- and 7-Year Total Shareholder Return Units (TSRUs)** Each represents 25% of total annual grant value (50% in total)	Absolute TSR	5- and 7-Year TSRUs generally vest three years from the grant date and are settled on the fifth or seventh anniversary of the grant date, respectively The value earned for each TSRU is equal to the difference between the settlement price (the 20-day average of the closing prices of Pfizer common stock ending on the settlement date) and the grant price (the closing price of Pfizer common stock on the date of grant), plus the value of dividend equivalents accumulated over the term. This value, if any, is converted into shares by dividing it by the settlement price; no value is received if the TSR is negative
Performance Share Awards (PSAs) Represents 50% of total annual grant value	Adjusted Net Income* and relative TSR	PSAs have a three-year performance period starting on January 1st of the year of grant and generally vest on the third anniversary of the grant based on performance PSAs are paid based on the company's performance against a combination of an adjusted net income* goal, set annually, over three one-year periods and relative TSR, as compared to the DRG Index, over a three-year period. The payout is capped at target if TSR for the performance period is negative Dividend equivalents are applied to the number of shares actually earned under the award, if any, at the end of the performance period Earned PSAs and dividend equivalents are paid in cash or shares of Pfizer common stock

Figure C 1: This figure shows an excerpt from Pfizer's 2019 proxy statement.

Example 2: FedEx (2018)

This example shows how the firm-level *Metric Similarity* measure is calculated, as well as examples adjusted metrics in the Incentive Lab data. *Metric Similarity* is the average pairwise similarity of metrics across the executive team. The denominator of the similarity metric is the total number of unique metrics across the entire executive team. The * in the column "Unique metric to the firm-year" indicates the first time a particular unique metric is encountered when looking at all named executives' performance measures. In this example, there are 6 total unique metrics (6 metrics indicated with a *): "Adjusted consolidated operating income", "Adjusted EPS", and 4 "Individual" metrics. Metrics labeled as "Individual" are by definition unique to each executive. The numerator is the number of common metrics between each executive pair. In this case, each executive pair has two metrics in common ("Adjusted consolidated operating income" and "Adjusted EPS") so the metric similarity for each pair is 0.33. The overall firm level *Metric Similarity* is the average of all the pairwise values, which is also 0.33 in this example.

Executive	Metric	Vest High	Unique metric to the firm-year?	Adjusted metric?	Similarity with exec 2	Similarity with exec 3	Similarity with exec 4	Similarity with exec 5
1	Adjusted consolidated operating income	12	*	yes	2/6 = .33	2/6 = .33	2/6 = .33	2/6 = .33
	Adjusted EPS	36	*	yes				
2	Adjusted consolidated operating income	12		yes		2/6 = .33	2/6 = .33	2/6 = .33
	Individual	12	*	no				
	Adjusted EPS	36		yes				
3	Adjusted consolidated operating income	12		yes			2/6 = .33	2/6 = .33
	Individual	12	*	no				
	Adjusted EPS	36		yes				
4	Adjusted consolidated operating income	12		yes				2/6 = .33
	Individual	12	*	no				
	Adjusted EPS	36		yes				
5	Adjusted consolidated operating income	12		yes		Overall		0.33
	Individual	12	*	no				
	Adjusted EPS	36		yes				
		Total:	**6**					

The figures below show excerpts from the 2018 proxy statement for FedEx on which the above Incentive Lab coding is based. First, the proxy statement indicates that all executives are measured on adjusted consolidated operating income and then goes on to describe the nature of the adjustment.

Fiscal 2018 AIC Plan Design. In order to further motivate management to improve the company's overall financial performance, several changes have been made to the fiscal 2018 AIC program. Unlike the fiscal 2017 AIC plan that included performance metrics based on operating segment performance, the performance measure for all participants in the fiscal 2018 AIC plan is adjusted consolidated operating income.

In order to ensure that payouts under the fiscal 2018 AIC plan accurately reflect the company's core financial performance, the Board of Directors, upon the recommendation of the Compensation Committee, has approved excluding the impact of the MTM Adjustment and fiscal 2018 TNT Express integration and restructuring costs from fiscal 2018 consolidated operating income for purposes of the plan. The adjusted consolidated operating income target objective under the fiscal 2018 AIC program is the same as the fiscal 2018 business plan objective for adjusted consolidated operating income (the target and business plan objectives for consolidated operating income exclude fiscal 2018 TNT Express integration and restructuring costs and the MTM Adjustment).

The proxy statement also discusses the individual performance metrics used to assess non-CEO executives. Because of the allowed discretion, metrics coded as "individual" by Incentive Lab are considered unique to each executive and never coded as a common metric between executive pairs for the purpose of calculating *Metric Similarity*.

Mr. Smith may adjust each officer's bonus amount based on the achievement of individual performance objectives established at the beginning of the fiscal year. Mr. Smith will determine the achievement level of each officer's individual objectives at the conclusion of fiscal 2018.

The proxy statement also indicates that executives will be measured on EPS for the long term incentive (LTI) portion of their compensation.

Cash Payments Under LTI Program. The primary objective of our LTI program is to motivate management to contribute to our future success and to build long-term shareowner value and reward them accordingly. The program provides a long-term cash payment opportunity to members of management, including the named executive officers, based upon achievement of aggregate EPS goals for the preceding three-fiscal-year period. The LTI plan design provides for payouts that correspond to specific EPS goals established by the Board of Directors. The EPS goals represent total growth in EPS (over a base year) for the three-year term of the LTI plan. The following chart illustrates the relationship between EPS growth and payout:

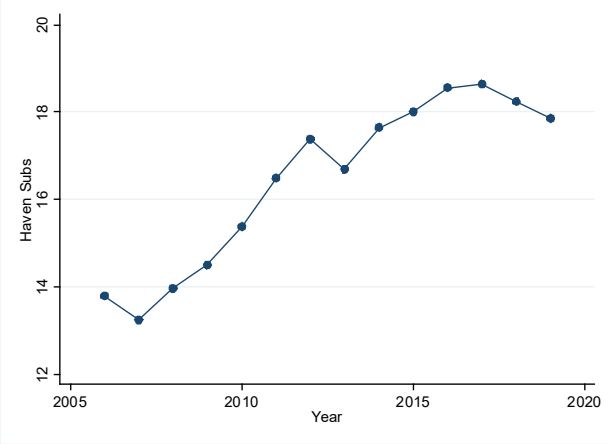
The proxy statement then describes the nature of the adjustments made to EPS for the purpose of determining long term incentive payout.

Mark-to-Market Accounting and Other Adjustments to EPS for LTI Plan Purposes. The Board of Directors, upon the recommendation of the Compensation Committee, approved the exclusion of certain items from fiscal 2015, fiscal 2016 and fiscal 2017 EPS for purposes of FedEx's FY2015–FY2017, FY2016–FY2018 and FY2017–FY2019 LTI plans, and for establishing the base-year EPS for the FY2016–FY2018, FY2017–FY2019 and FY2018-FY2020 LTI plans, as applicable. In particular, because the MTM Adjustment is not reflective of core business performance, the Board previously determined that the MTM Adjustment will be excluded from fiscal 2016 and fiscal 2017 EPS for purposes of the FY2015–FY2017 LTI plan and from EPS calculations under all future LTI plans, beginning with the FY2016–FY2018 LTI plan.

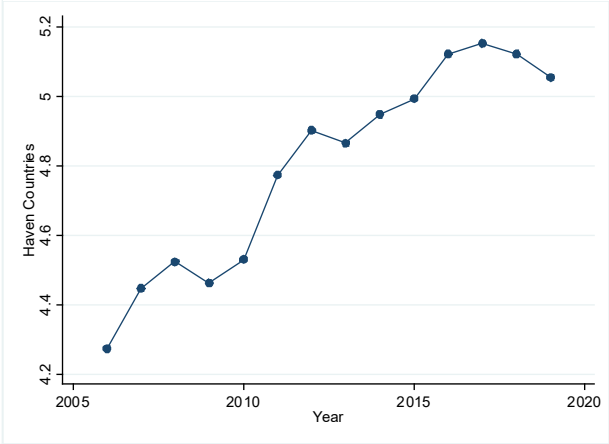
Figure 1: Subsidiaries in tax havens or low-tax countries over time

This figure presents yearly trends in each of the four components of TIOC: haven subs, haven countries, non-haven low tax subs and non-haven low tax countries. The sample for this figure follows the sample selection of our main sample but is additionally limited to a constant sample of 132 firms that have observations in each sample year (2006-2019).

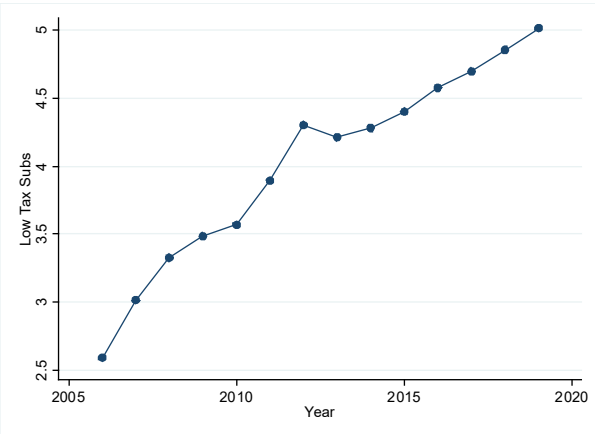
Panel A: Average subsidiaries in tax havens



Panel B: Average number of tax havens with at least one subsidiary



Panel C: Average subsidiaries in non-haven low tax countries



Panel D: Average number of non-haven low tax countries with at least one subsidiary

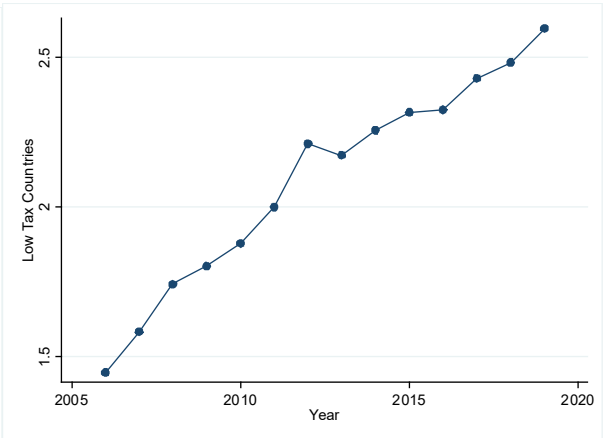
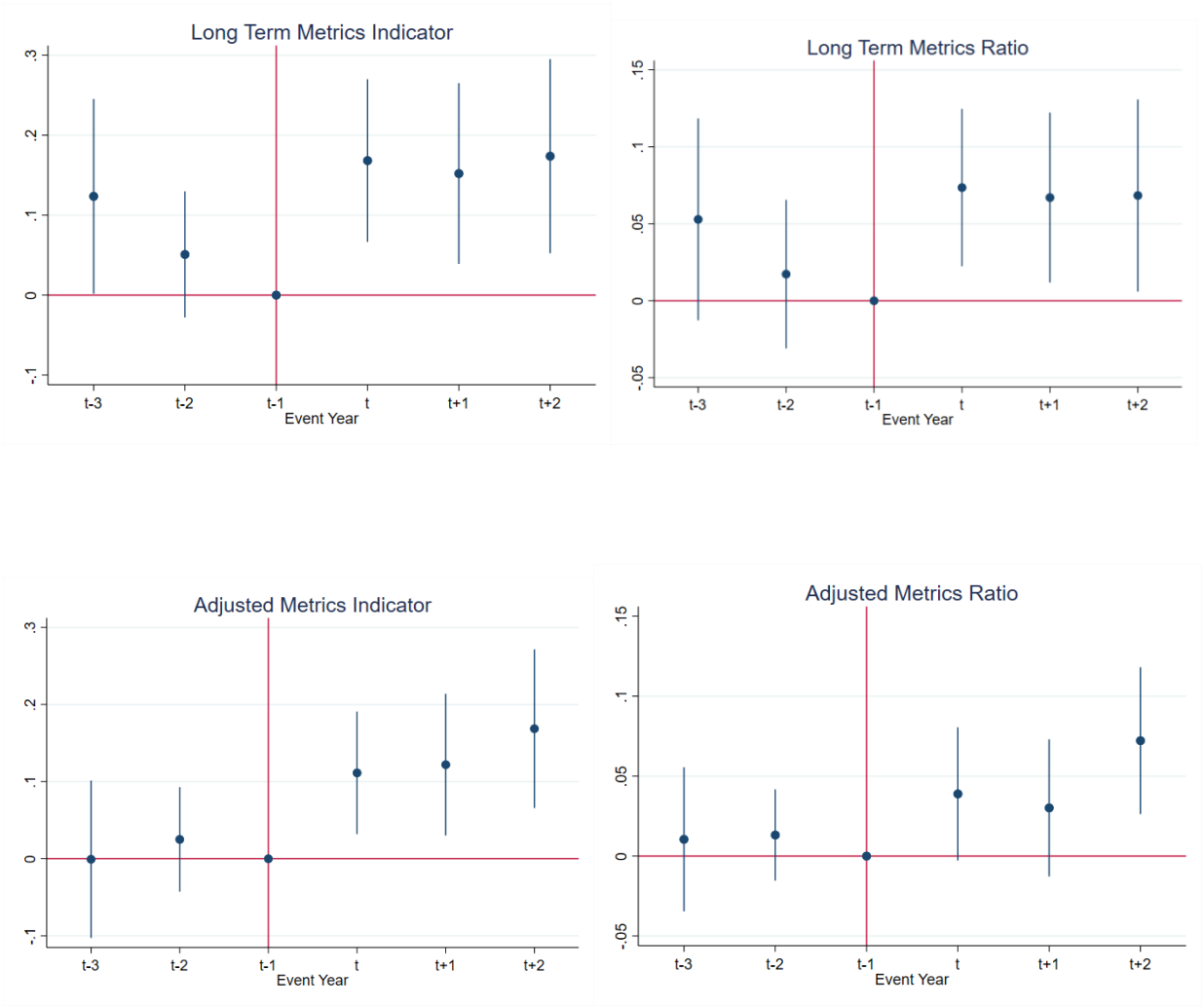
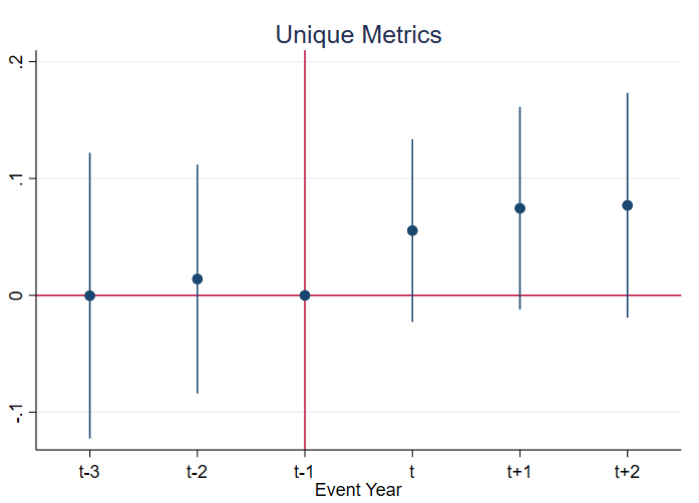


Figure 2: Treatment dynamics

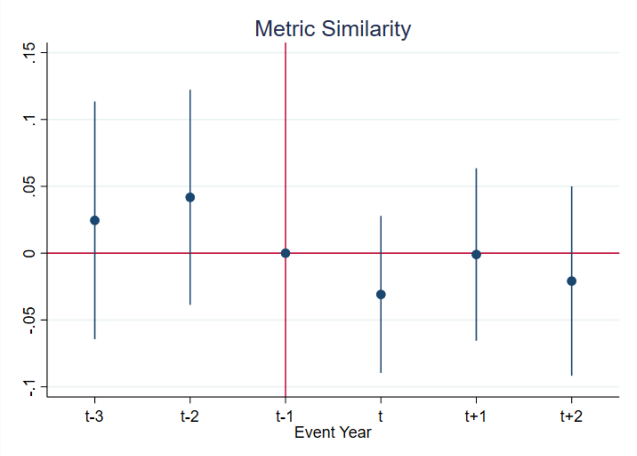
This figure presents the results of estimating a modified version of equation 2. We estimate this regression using a sample of *New TIOC* firms (firms with *TIOC* = 0 in years t-2 and t-1, and *TIOC* > 0 in year t; these are the treatment firms) and firms where *TIOC* = 0 (control firms), using a window of three years prior to the treatment year (i.e., the year in which *TIOC* becomes positive), and three years after the treatment year (including the year of treatment). For each dependent variable, we plot the coefficient on *New TIOC x Event-time Indicator*, including the full set of control variables and fixed effects in equation 2. *Event-time Indicator* is a vector of indicator variables, one for each of the years during the event window (three years leading up to year t, year t, and two years afterward). The dots represent the coefficient estimates for each interaction term, and the bars represent their 95 percent confidence intervals. Panel A presents results for executive-level dependent variables: *Long Term Metric Indicator*, *Long Term Metric Ratio, Adjusted Metric Indicator*, *Adjusted Metric Ratio*, and *Unique Metrics*. Panel B presents results for firm-level dependent variables: *Metric Similarity* and *Perfect Metric Similarity*. All variables are defined in Appendix B, and the regression design is described in section 5.1.

Panel A: Executive-level dependent variables





Panel B: Firm-level dependent variables



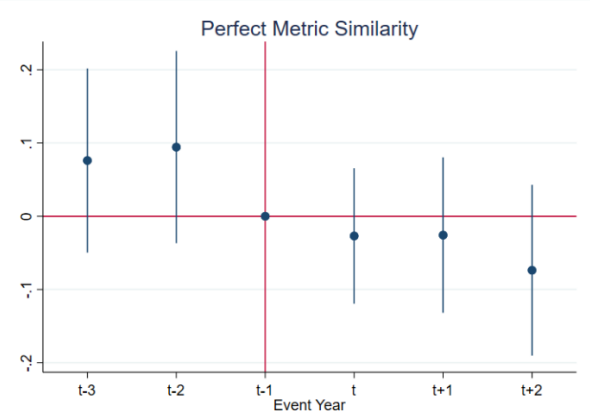


Table 1: Sample selection

This table summarizes our sample selection process and primary sample.

	Executive-year	Firm-year	Unique firms
Incentive Lab observations from 2006-2019	74,436	14,556	1,512
- Utilities and financials	55,422	10,825	1,140
- No Exhibit 21 data	48,815	9,529	1,113
- No foreign subsidiaries	42,528	8,256	990
- Insufficient data to calculate controls	38,597	7,265	931

Table 2: TIOC descriptive statistics

This table presents firm-level descriptive statistics of tax-induced organizational complexity (TIOC). Panel A presents descriptive statistics of the four components that are the basis for the composite TIOC measure. Panel B shows correlations between the four component measures. Panel C shows differences in means between and low and high TIOC firms based on a median split. *, **, and *** denotes that the differences in means across two partitions is statistically significant at the 10%, 5%, and 1% levels, respectively.

Panel A: TIOC components

	Obs.	Mean	SD	Min	P25	P50	P75	Max
Haven Subs	7,265	10.93	17.85	0	1	5	12	206
Haven Countries	7,265	3.76	3.35	0	1	3	5	24
Low Tax Subs	7,265	2.87	5.01	0	0	1	3	52
Low Tax Countries	7,265	1.57	2.14	0	0	1	2	16

Panel B: TIOC component correlations

	Haven Subs	*Haven Countries*	*Low Tax Subs*
Haven Subs			
Haven Countries	0.78***		
Low Tax Subs	0.77***	0.71***	
Low Tax Countries	0.66***	0.75***	0.85***

Panel C: Descriptive statistics

	High TIOC		**Low TIOC**			
	Mean	**SD**	**Mean**	**SD**	**Difference**	
Haven subs	20.33	22.46	2.728	3.471	17.602	***
Haven countries	6.302	3.114	1.532	1.383	4.77	***
Low tax subs	5.776	6.13	0.328	0.618	5.448	***
Low tax countries	3.036	2.354	0.281	0.475	2.755	***
Size (ln(MVE))	8.898	1.306	8.329	1.350	0.569	***
Size (MVE)	19,531	37,591	14,628	45,347	4,903	***
Business Dispersion	0.332	0.310	0.243	0.279	0.089	***
Geographic Dispersion	0.473	0.245	0.300	0.285	0.173	***
Foreign Income	0.058	0.058	0.037	0.059	0.021	***
Acquisitions	0.053	0.120	0.048	0.125	0.005	*
Restructuring Expense	0.007	0.010	0.004	0.010	0.003	***
MTB	4.393	5.480	4.580	6.137	-0.187	
R&D	0.052	0.082	0.075	0.162	-0.023	***
Missing R&D	0.250	0.433	0.342	0.475	-0.092	***
Stock Return Volatility	0.088	0.042	0.101	0.049	-0.013	***
UTB balance	0.013	0.016	0.009	0.015	0.004	***

Table 3: Descriptive statistics

This table presents descriptive statistics of the variables employed in our primary analyses. All variables are defined in Appendix B.

	Obs.	Mean	SD	P25	P50	P75
Firm level:						
TIOC	7,265	1.68	1.25	0.50	1.50	2.75
Metric Similarity	7,265	0.60	0.32	0.33	0.52	1.00
Perfect Metric Similarity	7,265	0.29	0.46	0.00	0.00	1.00
Unique Executives	7,265	5.20	0.89	5.00	5.00	6.00
OC controls:						
Size	7,265	8.59	1.36	7.70	8.46	9.41
Business Dispersion	7,265	0.28	0.30	0.00	0.19	0.57
Geographic Dispersion	7,265	0.38	0.28	0.00	0.45	0.62
Foreign Income	7,265	0.05	0.06	0.00	0.02	0.07
Acquisitions	7,265	0.05	0.12	0.00	0.00	0.04
Restructuring Expense	7,265	0.01	0.01	0.00	0.00	0.01
Other controls:						
MTB	7,265	4.49	5.84	1.86	2.94	4.80
R&D	7,265	0.06	0.13	0.00	0.01	0.08
Missing R&D	7,265	0.30	0.46	0.00	0.00	1.00
Stock Return Volatility	7,265	0.09	0.05	0.06	0.08	0.12
Executive level:						
TIOC	38,597	1.68	1.25	0.50	1.50	2.75
Long Term Metrics Indicator	38,597	0.62	0.49	0.00	1.00	1.00
Long Term Metrics Ratio	38,597	0.26	0.27	0.00	0.25	0.43
Adjusted Metrics Indicator	38,597	0.29	0.45	0.00	0.00	1.00
Adjusted Metrics Ratio	38,597	0.11	0.21	0.00	0.00	0.15
Unique Metrics (logged)	38,597	1.59	0.42	1.39	1.61	1.95
OC controls:						
Size	38,597	8.62	1.35	7.73	8.48	9.44
Business Dispersion	38,597	0.29	0.30	0.00	0.20	0.57
Geographic Dispersion	38,597	0.38	0.28	0.00	0.44	0.62
Foreign Income	38,597	0.05	0.06	0.00	0.02	0.07
Acquisitions	38,597	0.05	0.12	0.00	0.00	0.04
Restructuring Expense	38,597	0.01	0.01	0.00	0.00	0.01
Other controls:						
MTB	38,597	4.38	5.00	1.86	2.94	4.80
R&D	38,597	0.06	0.13	0.00	0.01	0.08
Missing R&D	38,597	0.30	0.46	0.00	0.00	1.00
Stock Return Volatility	38,597	0.09	0.05	0.06	0.08	0.12
Retire	38,597	0.37	0.48	0.00	0.00	1.00

Table 4: Length of performance measurement period

This table presents the results of estimating equation 1. In columns 1 through 3 (4 through 6), the dependent variable is *Long Term Metric Indicator* (*Long Term Metric Ratio*). *Long Term Metric Indicator* is equal to 1 for executive-years with at least 1 metric that is measured over a period longer than 12 months. *Long Term Metric Ratio* is the proportion of metrics that are measured over a period longer than 12 months in an executive-year. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. All variables are defined in Appendix B. Columns 2 and 5 (3 and 6) include industry-year and executive type fixed effects (control variables and industry-year and executive type fixed effects). We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variable:	*Long Term Indicator*			*Long Term Ratio*		
TIOC	0.0553***	0.0572***	0.0198**	0.0243***	0.0254***	0.0105**
	(6.232)	(6.422)	(2.145)	(4.766)	(5.081)	(2.067)
OC controls:						
Size			0.0411***			0.0187***
			(4.469)			(3.348)
Business Dispersion			0.136***			0.0691***
			(3.631)			(3.038)
Geographic Dispersion			0.0561			0.0420*
			(1.307)			(1.666)
Foreign Income			0.0325			-0.134
			(0.177)			(-1.310)
Acquisitions			-0.0803			-0.0150
			(-1.639)			(-0.537)
Restructuring Expense			2.376***			0.216
			(3.864)			(0.647)
Other controls:						
MTB			-0.00215			-0.00209**
			(-1.203)			(-2.541)
R&D			-0.417***			-0.129***
			(-4.944)			(-2.737)
Missing R&D			0.000677			0.0150
			(0.0217)			(0.773)
Stock Return Volatility			-0.629***			-0.245*
			(-2.989)			(-1.927)
Retire			-0.0371***			-0.0125**
			(-4.012)			(-2.332)
Constant	0.526***			0.222***		
	(26.54)			(20.26)		
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adjusted R-squared	0.020	0.176	0.220	0.012	0.139	0.163
Industry-Year FE	NO	YES	YES	NO	YES	YES
Executive Type FE	NO	YES	YES	NO	YES	YES
Oster (2019) Delta		1.020			1.317	

Table 5: Adjusted measurement

This table presents the results of estimating equation 1. In columns 1 through 3 (4 through 6), the dependent variable is *Adjusted Metric Indicator* (*Adjusted Metric Ratio*). *Adjusted Metric Indicator* is equal to 1 for executive-years with at least one metric described as "Adjusted" or "Non-GAAP". *Adjusted Metric Ratio* is the proportion of metrics described as "Adjusted" or "Non-GAAP" in an executive-year. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. All variables are defined in Appendix B. Columns 2 and 5 (3 and 6) include industry-year and executive type fixed effects (control variables and industry-year and executive type fixed effects). We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variable:	*Adjusted Metrics Indicator*			*Adjusted Metrics Ratio*		
TIOC	0.0398***	0.0372***	0.0265***	0.0123***	0.00965***	0.00774*
	(4.658)	(4.655)	(3.164)	(3.281)	(2.729)	(1.931)
OC controls:						
Size			-0.000795			-0.00810*
			(-0.0907)			(-1.959)
Business Dispersion			0.0250			0.0313*
			(0.729)			(1.932)
Geographic Dispersion			-0.00524			0.00101
			(-0.136)			(0.0517)
Foreign Income			-0.0889			0.0119
			(-0.510)			(0.153)
Acquisitions			0.220***			0.0799***
			(4.596)			(3.473)
Restructuring Expense			3.378***			0.751***
			(5.029)			(2.612)
Other controls:						
MTB			-0.00280			-0.00107
			(-1.533)			(-1.339)
R&D			-0.362***			-0.129***
			(-5.479)			(-4.252)
Missing R&D			-0.0806***			-0.0190
			(-2.993)			(-1.325)
Stock Return Volatility			-0.0714			-0.0388
			(-0.414)			(-0.488)
Retire			-0.00391			0.00526
			(-0.475)			(1.315)
Constant	0.223***			0.0869***		
	(13.61)			(11.76)		
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adjusted R-squared	0.012	0.240	0.260	0.005	0.209	0.223
Industry-Year FE	NO	YES	YES	NO	YES	YES
Executive Type FE	NO	YES	YES	NO	YES	YES
Oster (2019) Delta		2.557			2.385	

Table 6: Types of adjustments to performance measures

This table presents the results of estimating a modified version of equation 1. The dependent variable is one of the six indicator variables described in section 4.2. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. Columns 1, 3, 5, 7, 9, and 11 only include *TIOC* as an independent variable; the other columns additionally include the time-varying firm-level controls in equation 1.These regressions are estimated on the subsample of executives in 2013 that we are able to match to the Curtis et al. (2021) data. Additional details are provided in section 4.2. *TIOC* and the control variables are defined in Appendix B. We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. variable:	*Acquisitions*		*Impairment*		*Restructuring*		*Acquired Intangibles*		*Foreign Currency*		*Other*	
TIOC	0.0925***	0.0948***	0.0146	0.0274*	0.0559***	0.0512**	0.0145	0.0261**	0.0321***	0.0229*	0.0397**	0.0427**
	(5.146)	(4.746)	(1.054)	(1.769)	(2.952)	(2.504)	(1.529)	(2.478)	(2.702)	(1.718)	(2.148)	(2.138)
OC controls:												
Size		-0.0340*		-0.0384**		-0.0426**		-0.0144		-0.0139		-0.00666
		(-1.676)		(-2.513)		(-2.131)		(-1.062)		(-1.096)		(-0.326)
Business Dispersion		0.0795		-0.0492		0.0208		-0.0597		0.0592		-0.0455
		(1.005)		(-0.820)		(0.269)		(-1.237)		(1.190)		(-0.577)
Geographic Dispersion		-0.1000		-0.0869		-0.139		-0.111		-0.0471		-0.208**
		(-0.983)		(-1.045)		(-1.360)		(-1.621)		(-0.660)		(-2.051)
Foreign Income		-0.0701		0.0170		0.292		0.283		0.562*		0.243
		(-0.164)		(0.0501)		(0.680)		(0.964)		(1.862)		(0.572)
Acquisitions		0.225		0.139		0.0320		0.127		0.00545		0.000808
		(1.605)		(0.923)		(0.262)		(1.147)		(0.0800)		(0.00679)
Restructuring Expense		5.866**		5.092**		15.53***		-0.674		3.680*		7.100***
		(2.219)		(2.101)		(7.107)		(-0.627)		(1.693)		(2.810)
Other controls:												
MTB		-3.52e-05		-0.00339		-0.000270		-0.000591		0.00490		0.00624
		(-0.00539)		(-1.158)		(-0.0453)		(-0.283)		(1.048)		(1.095)
R&D		0.395		-0.191		-0.463		1.190***		-0.377**		-0.0887
		(1.042)		(-0.780)		(-1.256)		(3.752)		(-2.373)		(-0.248)
Missing R&D		0.0182		0.0115		-0.0255		0.0195		0.0183		-0.0184
		(0.339)		(0.249)		(-0.448)		(0.687)		(0.499)		(-0.338)
Stock Return Volatility		-2.016***		-0.636		-1.342		-0.385		-1.012**		-0.708
		(-2.704)		(-1.162)		(-1.646)		(-0.877)		(-2.067)		(-0.952)
Constant	0.164***	0.580***	0.106***	0.507***	0.263***	0.746***	0.0618***	0.182	0.0537**	0.224*	0.266***	0.418**
	(4.438)	(2.841)	(3.663)	(3.315)	(6.461)	(3.549)	(3.143)	(1.430)	(2.496)	(1.702)	(6.768)	(2.030)
Observations	499	499	499	499	499	499	499	499	499	499	499	499
Adjusted R-squared	0.057	0.081	0.001	0.033	0.018	0.103	0.002	0.091	0.014	0.038	0.009	0.023

Table 7: Number of unique metrics

This table presents the results of estimating equation 1. The dependent variable is *Unique Metrics*, which is the natural log of one plus the number of unique performance metrics in an executive-year. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. All variables are defined in Appendix B. Fixed effects are included for industry-year and executive type. We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
Dep. variable:		Unique Metrics	
TIOC	0.0525***	0.0518***	0.0179**
	(6.237)	(6.466)	(2.117)
OC controls			
Size			0.0472***
			(5.039)
Business Dispersion			0.00338
			(0.101)
Geographic Dispersion			0.0465
			(1.279)
Foreign Income			-0.0674
			(-0.412)
Acquisitions			-0.0590
			(-1.457)
Restructuring Expense			2.123***
			(4.012)
Other firm level controls:			
MTB			0.000151
			(0.0943)
R&D			-0.410***
			(-6.616)
Missing R&D			-0.0891***
			(-3.105)
Stock Return Volatility			-0.729***
			(-4.097)
Retire			-0.0185**
			(-2.115)
Constant	1.500***		
	(86.79)		
Observations	38,597	38,597	38,597
Adjusted R-squared	0.025	0.187	0.236
Industry-Year FE	NO	YES	YES
Executive Type FE	NO	YES	YES
Oster (2019) Delta		0.956	

Table 8: Metric similarity across the executive team

This table presents the results of estimating equation 1. In columns 1 through 3 (4 through 6), the dependent variable is *Metric Similarity* (*Perfect Metric Similarity*). *Metric Similarity* is the average proportion of common metrics between each pair of executives. *Perfect Metric Similarity* is an indicator equal to 1 for executive teams with *Metric Similarity* = 1. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. All variables are defined in Appendix B. Columns 2 and 5 (3 and 6) include industry-year fixed effects (control variables and industry-year fixed effects). We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variable:	*Metric Similarity*			*Perfect Metric Similarity*		
TIOC	-0.00559	-0.00653	-0.0147**	-0.0253***	-0.0238***	-0.0231***
	(-0.919)	(-1.024)	(-2.244)	(-3.113)	(-2.898)	(-2.649)
OC controls:						
Size			0.00705			-0.00213
			(1.012)			(-0.232)
Business Dispersion			0.0330			0.00451
			(1.227)			(0.124)
Geographic Dispersion			0.0465			0.0528
			(1.417)			(1.250)
Foreign Income			-0.218			-0.177
			(-1.550)			(-0.975)
Acquisitions			-0.0564			-0.0364
			(-1.452)			(-0.692)
Restructuring Expense			-0.408			-1.160*
			(-0.814)			(-1.715)
Other firm level controls:						
MTB			-0.000325			0.000784
			(-0.271)			(0.463)
R&D			-0.262***			-0.112
			(-3.642)			(-1.444)
Missing R&D			0.0130			0.0400
			(0.588)			(1.333)
Stock Return Volatility			0.0697			0.387*
			(0.443)			(1.799)
Constant	0.607***			0.337***		
	(45.64)			(19.21)		
Observations	7,265	7,265	7,265	7,265	7,265	7,265
Adjusted R-squared	0.000	0.026	0.040	0.005	0.031	0.034
Industry-Year FE	NO	YES	YES	NO	YES	YES
Oster (2019) Delta		-6.957			4.978	

Table 9: New TIOC vs. other firms

This table presents the results of estimating equation 2. The main independent variable is the interaction of *New TIOC* and *Post*. *New TIOC* is an indicator variable equal to one if the firm has *TIOC* = 0 in years t-2 and t-1, and *TIOC* > 0 in year t. *Post* is an indicator variable equal to one if the year is after the treatment year. We estimate this regression using a sample of *New TIOC* firms (treatment firms) and firms where *TIOC* = 0 (control firms), using a window of three years prior to the treatment year (i.e., the year in which *TIOC* becomes positive), and three years after the treatment year (including the year of treatment). Panel A presents results for executive-level dependent variables: *Long Term Metric Indicator*, *Long Term Metric Ratio*, *Adjusted Metric Indicator*, *Adjusted Metric Ratio and Unique Metrics*. Panel B presents results for firm-level dependent variables: *Metric Similarity* in column 1 and *Perfect Metric Similarity* in column 2. All columns include time-varying control variables as well as firm and cohort-year fixed effects. All columns include the time-varying control variables as well as firm, cohort-year, industry-year, and executive type fixed effects. We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Executive-level dependent variables

	(1)	(2)	(3)	(4)	(5)
	Long Term Metric		*Adjusted Metric*		
Dependent variable:	*Indicator*	*Ratio*	*Indicator*	*Ratio*	*Unique Metrics*
New TIOC x Post	0.109**	0.0477*	0.121***	0.0369*	0.0625*
	(2.268)	(1.936)	(2.778)	(1.747)	(1.754)
Observations	19,104	19,104	19,104	19,104	19,104
Adjusted R-squared	0.787	0.789	0.791	0.761	0.744
Industry-year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Cohort-year FE	YES	YES	YES	YES	YES
Executive Type FE	YES	YES	YES	YES	YES
Time varying controls	YES	YES	YES	YES	YES

s

	(1)	(2)
Dependent variable:	*Metric Similarity*	*Perfect Metric Similarity*
New TIOC x Post	-0.0388	-0.0930**
	(-1.478)	(-2.202)
Observations	3,913	3,913
Adjusted R-squared	0.589	0.493
Firm FE	YES	YES
Cohort-year FE	YES	YES
Time varying controls	YES	YES

Table 10: Robustness tests

This table presents the results of estimating equation 1. Panel A reports the results of executive-level analyses, which employ several different dependent variables. *Long Term Metric Indicator* is equal to 1 for executive-years with at least 1 metric that is measured over a period longer than 12 months. *Long Term Metric Ratio* is the proportion of metrics that are measured over a period longer than 12 months in an executive-year. *Adjusted Metric Indicator* is equal to 1 for executive-years with at least one metric described as "Adjusted" or "Non-GAAP." *Adjusted Metric Ratio* is the proportion of metrics described as "Adjusted" or "Non-GAAP" in an executive-year. *Unique Metrics* is the natural log of one plus the number of unique performance metrics in an executive-year. Panel B reports the results of firm-level analyses, where either *Metric Similarity* or *Perfect Metric Similarity* is the dependent variable. *Metric Similarity* is the average proportion of common metrics between each pair of executives. *Perfect Metric Similarity* is an indicator equal to 1 for executive teams with *Metric Similarity* = 1. The main independent variable is *TIOC*, which is a composite measure of a firm's operations in haven and low-tax countries in a given year. Each column presents an alternative version of *TIOC*. Columns 1 and 2 use alternative composite measures of *TIOC*, while columns 3 through 6 use the four individual components measures themselves. See Section 5 for details on the construction of these alternative *TIOC* measures. All variables are defined in Appendix B. All columns include control variables and industry-year fixed effects, and in Panel B we additionally include executive-type fixed effects. We report t-statistics based on standard errors clustered at the firm level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Executive-level results

	(1)	(2)	(3)	(4)	(5)	(6)
TIOC defined:	Quartiles	Quintiles	Haven Subs	Haven Countries	Low Tax Subs	Low Tax Countries
Dep. variable:			*Long Term Metric Indicator*			
TIOC	0.111**	0.101**	0.0237**	0.0385**	0.0153	0.0252
	(2.466)	(2.340)	(2.344)	(2.461)	(1.294)	(1.602)
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adj. R-squared	0.22	0.22	0.22	0.22	0.218	0.219
Dep. variable:			*Long Term Metric Ratio*			
TIOC	0.0592**	0.0578**	0.0110**	0.0168**	0.0141**	0.0200**
	(2.421)	(2.454)	(1.974)	(1.983)	(2.103)	(2.304)
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adj. R-squared	0.164	0.164	0.163	0.163	0.163	0.164
Dep. variable:			*Adjusted Metric Indicator*			
TIOC	0.136***	0.131***	0.0218**	0.0323**	0.0379***	0.0473***
	(3.466)	(3.483)	(2.317)	(2.409)	(3.233)	(3.057)
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adj. R-squared	0.261	0.261	0.259	0.259	0.261	0.260

Dep. variable:			*Adjusted Metric Ratio*			
TIOC	0.0403**	0.0414**	0.00641	0.00933	0.0124**	0.0134*
	(2.111)	(2.242)	(1.414)	(1.422)	(2.195)	(1.901)
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adj. R-squared	0.223	0.223	0.222	0.222	0.224	0.223
Dep. variable:			*Unique Metrics*			
TIOC	0.0850**	0.0817**	0.0237**	0.0302**	0.0129	0.0203
	(2.105)	(2.117)	(2.498)	(2.087)	(1.182)	(1.355)
Observations	38,597	38,597	38,597	38,597	38,597	38,597
Adj. R-squared	0.236	0.236	0.236	0.236	0.234	0.234
Controls	YES	YES	YES	YES	YES	YES
Industry-year FE	YES	YES	YES	YES	YES	YES
Executive type FE	YES	YES	YES	YES	YES	YES

Panel B: Firm-level results

	(1)	(2)	(3)	(4)	(5)	(6)
TIOC defined:	Quartiles	Quintiles	Haven Subs	Haven Countries	Low Tax Subs	Low Tax Countries
Dep. variable:			*Metric Similarity*			
TIOC	-0.0639**	-0.0632**	-0.0224***	-0.0257**	-0.0149*	-0.0188
	(-1.997)	(-2.050)	(-3.078)	(-2.311)	(-1.726)	(-1.629)
Observations	7,265	7,265	7,265	7,265	7,265	7,265
Adj. R-squared	0.039	0.039	0.042	0.04	0.039	0.039
Dep. variable:			*Perfect Metric Similarity*			
TIOC	-0.112***	-0.111***	-0.0329***	-0.0432***	-0.0203*	-0.0325**
	(-2.641)	(-2.707)	(-3.305)	(-2.898)	(-1.758)	(-2.126)
Observations	7,265	7,265	7,265	7,265	7,265	7,265
Adj. R-squared	0.034	0.034	0.036	0.035	0.032	0.033
Controls	YES	YES	YES	YES	YES	YES
Industry-year FE	YES	YES	YES	YES	YES	YES