Journal of International Business Studies (2018) 49, 49–69

www.jibs.net

Tax havens and disclosure aggregation

Herita Akamah[1], Ole-Kristian Hope[2,3] and Wayne B Thomas[4]

[1] *College of Business Administration, University of Nebraska – Lincoln, Lincoln, USA;* [2] *Rotman School of Management, University of Toronto, Toronto, Canada;* [3] *BI Norwegian Business School, Oslo, Norway;* [4] *Michael F. Price College of Business, University of Oklahoma, Norman, USA*

Correspondence:
Hope, Rotman School of Management, University of Toronto, Toronto, Canada
e-mail: okhope@rotman.utoronto.ca

Abstract

Multinational firms have been accused by politicians, regulators, and citizen groups of shifting profits to low-tax geographic areas. We present evidence that multinational firms with tax-haven operations tend to aggregate their geographic disclosures to a greater extent. The results are consistent with managers attempting to avoid criticism by reducing the transparency of their tax-avoidance activities. We find these results to be stronger for larger firms with higher political costs and for firms in natural-resources industries, in retail industries, or with low competition. The evidence is relevant to policymakers and others interested in multinational firms' financial reporting and tax activities.

Journal of International Business Studies (2018) **49**, 49–69.
https://doi.org/10.1057/s41267-017-0084-x

Keywords: tax havens; aggregation; disclosure transparency; tax avoidance; geographic reporting; Exhibit 21

INTRODUCTION

Many US corporations are accused of avoiding taxes by shifting profits offshore (e.g., Klassen and Laplante, 2012a, b; PWC, 2012). Citizens for Tax Justice (CTJ, 2015) reports that as of the end of 2014, 358 of the Fortune 500 companies maintain at least 7,622 tax-haven subsidiaries, avoiding an estimated $90 billion in federal taxes. These tax-avoidance practices often are met with harsh criticism by politicians, regulators, and citizen groups. As just one of many recent examples, Senator Carl Levin introduced the "Stop Corporate Inversion Act of 2015" to significantly reduce the ability of US corporations to relocate their corporate headquarters offshore to lower-tax jurisdictions through mergers with a foreign corporation (commonly referred to as tax inversions). Similar tax-avoidance concerns are expressed in other countries as well. The Organisation of Economic Co-operation and Development (OECD) published "Action Plan on Base Erosion and Profit Shifting" in 2013, which aims to help governments reduce MNCs' ability to shift profits to low-tax jurisdiction. In this study, we are interested in firms' disclosures in the presence of such criticism. Specifically, this study provides evidence on the link between US multinationals' geographic disclosures and the extent of their operations in tax havens.

Firms' disclosure of geographic operations can be found from at least two sources – Exhibit 21 in the Form 10-K and the segment note following the financial statements. Exhibit 21 provides a list of countries in which all material subsidiaries are located. However, firms

Received: 6 August 2016
Revised: 30 March 2017
Accepted: 24 April 2017
Online publication date: 6 June 2017

are not required to disclose any financial information for these individual subsidiaries. Thus, Exhibit 21 offers the ability to identify firms more likely engaged in income shifting (i.e., those with tax havens), but it does not provide financial information to determine the degree of income shifting or from which country that income is being shifted. Geographic disclosures potentially provide additional information because firms are required to provide financial information related to foreign operations. It is country-level disclosure of profits by subsidiary location that many feel would be especially important in helping to understand firms' tax-avoidance behavior (Association for Accountancy & Business Affairs, 2003; Global Witness, 2005; Christian Aid, 2009; Financial Task Force, 2011).

Country-level disclosure of operations is addressed under current financial reporting requirements (ASC 280, previously referred to as SFAS 131). Specifically, firms are required to disclose sales and assets for each *material* country. Firms are not required to disclose profits for material countries unless they define their operating segments by geographic area, and most do not (Herrmann & Thomas, 2000). In addition, ASC 280 allows financial information for all *immaterial* countries to be aggregated (i.e., grouped), and the standard provides no clearly defined basis for determining materiality (e.g., sales by location of customer, sales by location of selling subsidiary, etc.). Firms appear to take advantage of the vague materiality guidelines in ASC 280 because very few US multinationals provide country-by-country reporting of their foreign operations. Instead, most firms choose high-level aggregation of operations into regions, continents, or even a single "Total Foreign" area. Such aggregation essentially offers very limited (if any) information useful in understanding specific geographic operations and the use of structured transactions in foreign countries to circumvent taxes.

Managers have been subject to increasing criticism from politicians, regulators, citizen groups, and the media related to tax-haven operations. These groups are concerned that tax-haven subsidiaries exist for the purpose of allowing companies to avoid paying their fair share of taxes rather than for structuring real operating activities (e.g., Tax Justice Network, 2003; Christian Aid, 2009; Citizens for Tax Justice, 2015). In response to this criticism, managers have incentives to make the firm's income shifting practices less transparent. One way to do so would be to use the vague country-level materiality guidelines of ASC 280 to aggregate geographic disclosures. This would include aggregating the disclosure of tax-haven operations, as well as operations in non-tax-haven countries from which profits are being shifted. Thus, we are interested in the aggregation of both tax-haven countries and non-tax-haven countries. We measure geographic aggregation by mapping the country of each of the firm's foreign subsidiaries listed in Exhibit 21 to its related geographic area disclosed in the segment note.

Coding geographic disclosures involves assigning a unique identifier to each geographic title disclosed in the Compustat Segment file for each firm over the sample period. Geographic titles vary widely across firms, consisting of a mix of countries, regions, continents, and total foreign. We find that there are 2,774 unique geographic titles disclosed by our sample firms, and we provide a unique identifier to each title. We match the countries of all subsidiaries listed in Exhibit 21 to their related geographic title in the segment note to determine the extent to which country-specific operations have been aggregated beyond the country level in geographic disclosures. We explain our aggregation measure in more detail in "Sample and Research Design" section. The final sample consists of 12,046 firm-years from 1998 to 2010 that disclose 29,648 firm-year-geographic areas and list 137,417 firm-year-countries in Exhibit 21.

Employing both association and changes analyses, we find that firms with greater use of tax havens are more likely to aggregate their disclosure of geographic operations in both tax havens and non-tax havens. The evidence is consistent with strong criticisms that managers attempt to hide their tax-avoidance activities through less transparent disclosures. We further find that the relation between tax havens and geographic disclosure aggregation is greater for larger firms (i.e., firms facing greater political costs) and for firms in natural-resources industries, in retail industries, or with low competition. These firms potentially face greater costs if their tax-avoidance activities are more transparent.

All test results are robust to controlling for numerous determinants of accounting information quality and addressing potential endogeneity. In addition, we employ three different *changes* analyses, so reasons related to endogeneity become more difficult to explain. Finally, we conduct several tests related to the measurement of both tax havens and geographic aggregation. No inferences are affected in these sensitivity analyses.

We contribute to the literature on the taxation of US multinational companies (including but not

limited to Liu & Hsueh, 1993; Dunne & Ndubizu, 1995; Nobes, 1996; Hope, Kang, Thomas, & Vasvari, 2009; Sugathan & George, 2015; Allred et al., 2017; Cumming et al., 2017). Given the growth of US multinationals' profits emanating from tax havens and the continued concerns about these firms' ability to avoid taxes, understanding disclosures related to geographic operations is important. Many complain that US multinationals' ability to shift US profits to low-tax foreign jurisdictions hinders domestic economic growth, reduces the development of social programs, and imposes disproportionate tax burdens on individual tax payers and domestic-only companies (GAO, 2008; Senate, 2006; CTJ, 2015). Others are concerned that multinationals are shifting taxes from poorer countries to tax havens to benefit (perhaps already wealthy) managers and shareholders. Our results suggest the definition of "material" countries for reporting purposes (ASC 280 and IFRS 8) may need to be reassessed to help make companies' tax-avoidance activities more transparent.

RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Research on the interaction between financial reporting and tax avoidance is still emerging (Shackelford & Shevlin, 2001; Hanlon & Heitzman, 2010). Examples of studies in this literature stream include Erickson, Hanlon, & Maydew (2004), Frank, Lynch, & Rego (2009), Hope, Ma, & Thomas (2013), Lennox, Lisowsky, & Pittman (2013), and Balakrishnan, Blouin, & Guay (2015). Related to financial reporting of foreign operations, firms have some discretion over the financial statement items to be reported and also the aggregation level at which those items are reported (country versus groups of countries versus continents, and so on). Each of these reporting issues offers a different perspective on how managers may attempt to reduce transparency to avoid criticisms of their tax-avoidance activities. Hope et al. (2013) examine the first reporting issue and find that non-disclosure of geographic earnings relates to firms' tax-avoidance behavior. Our study focuses on the second reporting issue – the aggregation of geographic information. We examine the degree to which firms with tax-haven operations aggregate their reported geographic information. It is the disaggregation of geographic information that has the potential to highlight the extent of income shifting among foreign countries.

Our examination of information aggregation is a core issue for accounting disclosure in general (Lev, 1968; Harvey, Rhode, & Merchant, 1979), and aggregation of geographic disclosures relates to tax shifting in particular. We are not aware of any other large-scale study that measures the disclosure aggregation of geographic operations, even beyond the context of tax-haven operations, likely because of the extensive hand collection required to measure geographic disclosure aggregation. Given that geographic disclosures relate directly to foreign operations (including income shifting), our setting provides a reliable test of the link between tax-haven operations and disclosure practices (i.e., between tax-related activities and financial reporting).

Herrmann & Thomas (2000) report that even though SFAS 131 (now ASC 280) requires firms to report the results of their foreign operations by material country, in practice most firms aggregate these results into more aggregated geographic areas such as "Other Foreign" Multinational companies' (MNCs') preference for more aggregated geographic disclosure is an interesting puzzle because economic theory about disclosure might predict an opposite behavior for firms in high-uncertainty environments. Specifically, theory predicts that in high-uncertainty environments, unless the costs outweigh the benefits, firms have a stronger incentive to increase disclosure in order to reduce information asymmetry and consequently lower the cost of capital (e.g., Dye, 1985, 1986; Verrecchia, 1999; Cheynel, 2013). An increase in disclosure quality should lead to a better understanding of business risks and reduce investors' assessed covariance of the firm's future cash flows with the cash flows of other firms, and hence lower the firm's cost of equity (Lambert, Leuz, & Verrecchia, 2007). Higher-quality disclosure can also alleviate agency concerns by allowing easier monitoring (Bens & Monahan, 2004; Hope & Thomas, 2008). Monitoring of MNCs' operations is often challenging because their activities can include foreign countries with different business cultures, different currencies, different socio-economic risks, and sometimes less transparent rules and weaker legal institutions (Dyreng, Hanlon, & Maydew, 2012).

Geographic disclosures, however, provide a setting in which the costs of transparency potentially outweigh the capital-market benefits. Based on the political-cost theory and empirical evidence in accounting (Stigler, 1971; Peltzman, 1976; Zimmerman, 1983; Watts & Zimmerman, 1986), we suggest increased transparency of foreign operations could increase political costs by pressuring changes in

domestic tax policy, initiating tax audits from foreign tax authorities, or provoking additional actions from foreign regulators. Even though the IRS has access to detailed information about the foreign operations of US multinationals, tax-watchdog groups, the media, customers, competitors, and foreign regulators do *not* have access to such information and hence must rely on public financial statements for analysis. By carefully scrutinizing this information, they can highlight suspected tax-avoidance behavior, which could cause reputational damage to the firm and instigate subsequent government sanctions (e.g., Chen, Chen, Cheng, & Shevlin, 2010). Graham, Hanlon, Shevlin, and Shroff (2014) provide corroborating survey evidence that managers believe increased transparency about tax avoidance can impair a firm's reputation. Managers therefore have incentives to make such activities less transparent.

The SEC is strongly interested in tax havens as evident from the publications of several large accounting firms (e.g., Deloitte, 2012). These publications analyze trends in SEC comment letters (Donohoe, McGill, & Outslay, 2012). In recent years, the SEC has increased its attention on registrants with foreign operations, especially in countries with political, financial, tax, and other uncertainties. The discussion in these comment letters highlights not only the materiality of tax havens, but also how regulators link geographic disclosures to tax avoidance. For example, an SEC comment letter to Argo International in 2011 requested that the company provides income before taxes and the income tax provisions for each country mentioned in the tax note of the firm's 2010 Form 10-K (United States, United Kingdom, Belgium, Brazil, Ireland, and Switzerland). The company complied in its 2011 Form 10-K. Prior to this period, Argo's filings mention the significant foreign countries that had or did not have a tax liability, but the company did not provide any financial information for these countries. Moreover, the company did not provide any geographic disclosures prior to this period. Following the SEC comment letter that requested this information, Argo disclosed revenue by Bermuda (country of incorporation), the United Kingdom, and the United States. The company also reported that it discloses revenue by country of domicile of its subsidiaries.

The US Government Accountability Office (GAO) also supports the view that greater country-level disclosure is important for understanding firms' tax activities. In a 2008 report to the US Senate Finance Committee, the GAO suggested that most firms with operations in countries with low effective tax rates generate profits that are disproportionately larger than what business measures would predict in the absence of income shifting. However, low worldwide effective tax rates do not always signal tax-avoidance activities. Some firms may have "legitimate" reasons for operating and profiting in countries with tax rates lower than those in the United States and other developed countries. More detailed disclosures of operations by geographic area would make the nature of such activities more transparent. As an example, the SEC requested in a 2010 comment letter to Google that the company's reconciliation between the US statutory tax rate and its effective tax rate details the difference *by foreign jurisdiction*. The SEC highlighted the fact that some foreign countries, as revealed by the firm's 2009 Form 10-K geographic disclosures, showed disproportionately higher earnings in low-tax jurisdictions.

Managers may also want to aggregate *non-tax-haven* operations from which income is being shifted. For example, to the extent a US firm is shifting profits from the UK and France (non-tax havens) to Ireland (tax haven), the manager may perceive that disclosing operations of all three countries in a single Europe segment reduce transparency. Even if profits from the UK and France are being shifted to a tax haven in a different geographic region (e.g., Bermuda), a manager may attempt to reduce the transparency of shifting income from the UK and France by disclosing both countries in a single Europe segment (and then also aggregating Bermuda operations in a single Latin America segment).

Taken together, the preceding points imply that managers have incentives to avoid criticisms associated with having operations in tax havens. Such operations are often perceived as firms' attempts to shift profits to avoid taxes. We predict that managers will provide more aggregated geographic disclosures when operating in tax havens. This leads to the following hypothesis:

Hypothesis 1: The firm's use of tax havens relates positively to the level of aggregation in geographic disclosures.

SAMPLE AND RESEARCH DESIGN

Sample

The sample begins with all US incorporated firms in the Compustat database from 1998 to 2010 with

both Exhibit 21 and geographic data. After requiring all necessary data for control variables (discussed below), the final sample includes 12,046 firm-year observations (see Appendix 1). From these firm-year observations, we collect and manually identify 2,774 unique geographic titles disclosed over the sample period. The titles consist of a wide variety of individual countries, regions, and continents, as well as their combinations. Each geographic title is assigned a unique identifier. Using Exhibit 21 data, we then assign corresponding identifiers to the individual countries in which the firm reports material subsidiaries. There are 137,417 firm-year-country observations from the Exhibit 21 data. This coding procedure allows us to determine the level at which each country in Exhibit 21 is aggregated in the geographic disclosures.

Research design

The following model tests our hypothesis of a positive relation between the use of tax havens and aggregation of geographic disclosures.

$$\text{NOMATCH}\%_{i,t} = \alpha_0 + \alpha_1 \text{HAVEN}_{i,t} + \beta_n \text{Control}_{n,i,t} + \varepsilon_{i,t} \quad (1)$$

NOMATCH% is the proportion of countries with foreign subsidiaries per Exhibit 21 that do *not* match a country-level geographic disclosure. For example, consider a firm that reports subsidiaries in Exhibit 21 in Luxembourg, Germany, and China. In the geographic disclosures, the firm discloses operations in an aggregated area (Europe) and a disaggregated area (China). In this case, *NOMATCH%* = 2/3 (i.e., two of the three countries with foreign subsidiaries in Exhibit 21 – Luxembourg and Germany – do not match a country-level geographic disclosure). If the firm reports a single aggregated geographic area (Europe/Asia), then all country-level subsidiaries in Exhibit 21 have no country-level match in geographic disclosures, so *NOMATCH%* = 1. Higher scores of *NOMATCH%* imply greater aggregation.

We use three measures of *HAVEN*. The first measure, *DHAVEN*, is a simple indicator variable for whether the firm has an operation in at least one tax-haven country in that year. Therefore, when model (1) uses *DHAVEN* as the independent variable, α_1 can be interpreted as the difference between firms with tax havens and firms without tax havens in the proportion of countries with foreign subsidiaries per Exhibit 21 that do *not* match a country-level geographic disclosure. Our hypothesis predicts that firms with tax havens will aggregate a larger portion of their Exhibit 21 countries ($\alpha_1 > 0$).

The second measure, *HAVEN%*, captures firms' concentration of material subsidiaries in tax havens. *HAVEN%* is the number of tax-haven countries divided by the total number of foreign countries per Exhibit 21 (Dyreng & Lindsey, 2009). The third measure is a count variable, *LOGHAVEN*, which is the natural logarithm of (one plus) the number of foreign countries with tax-haven status. For both *HAVEN%* and *LOGHAVEN*, we predict a positive relation with disclosure aggregation ($\alpha_1 > 0$).

The set of control variables used in Eq. (1) mainly consists of variables that have been found in the literature to explain variation in voluntary disclosure levels. Based on prior research (e.g., Healy & Palepu, 2001), these controls include audit quality (*BIG4*), firm size (*SIZE*), growth (*MTB*), debt (*LEV*), and return-on-assets (*ROA*). We also note that these variables potentially control for the firm's natural level of tax aggressiveness. For example, growth may reflect a firm's business strategy, which in turn impacts its tax aggressiveness (Higgins, Omer, & Phillips, 2015).

Several additional variables are included to control for measures previously identified in the literature related to tax avoidance or that potentially relate to the choice of having operations in a tax haven. These variables include intangible assets (*INTANG*), intellectual property (*RD*), property, plant, and equipment (*PPE*), advertising expense (*ADV*), equity income in subsidiaries (*EQINC*), indicator variable for net operating loss carried forward (*NOL*), and an indicator variable for an increase in *NOL* (*CNOL*). In addition, ASC 280 requires that material countries be disclosed. To control for cross-sectional differences in the likelihood that individual material countries exist, we use either the number of foreign subsidiaries divided by the number of countries listed in Exhibit 21 (*SUBMAT*) or the ratio of foreign sales to total sales (*FSR*). We expect these variables to relate negatively to geographic aggregation. See Appendix 2 for detailed definitions of control variables.

Table 1 Descriptive statistics

	Mean	SD	Min	25th	Med	75th	Max
Panel A: *DHAVEN* = 0 (*N* = 4,074 firm-years)							
Dependent variable							
NOMATCH %	0.70	0.41	0.00	0.50	1.00	1.00	1.00
Test variables							
DHAVEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAVEN %	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LOGHAVEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Control variables							
BIG4	0.91	0.28	0.00	1.00	1.00	1.00	1.00
SIZE	5.52	1.80	1.54	4.23	5.49	6.73	10.80
MTB	2.83	3.71	0.27	0.98	1.79	3.16	26.80
NOL	0.40	0.49	0.00	0.00	0.00	1.00	1.00
CNOL	0.59	0.49	0.00	0.00	1.00	1.00	1.00
ROA	−0.03	0.21	−0.89	−0.07	0.03	0.08	0.38
LEV	0.52	0.32	0.07	0.28	0.49	0.69	1.76
ADV	0.01	0.03	0.00	0.00	0.00	0.01	0.20
RD	0.06	0.10	0.00	0.00	0.01	0.08	0.48
INTANG	0.30	0.57	0.00	0.01	0.11	0.33	3.82
PPE	0.24	0.22	0.01	0.07	0.16	0.33	1.02
EQINC	0.00	0.00	−0.01	0.00	0.00	0.00	0.03
SUBMAT	1.99	1.84	1.00	1.00	1.50	2.00	29.00
FSR	0.28	0.24	0.00	0.11	0.22	0.39	1.00
Alternative dependent variables							
LEVEL	2.20	1.51	0.00	1.00	2.00	4.00	4.00
LEVEL_SALESWT	2.58	1.33	0.00	1.69	2.72	4.00	4.00
NOMATCH %_NOTES	0.68	0.38	0.00	0.50	1.00	1.00	1.00
LEVEL_NOTES	2.14	1.36	0.00	1.17	2.00	3.25	4.00
LEVEL_SALESWT_NOTES	2.52	1.23	0.00	1.63	2.49	4.00	4.00
NGEO_NOTES (−1)	−2.19	1.51	−14.00	−3.00	−2.00	−1.00	−1.00
	Mean	SD	Min	25th	Med	75th	Max
Panel B: *DHAVEN* = 1 (*N* = 7,972 firm-years)							
Dependent variable							
NOMATCH %	0.92**	0.16	0.00	0.91	1.00	1.00	1.00
Test variables							
DHAVEN	1.00**	0.00	1.00	1.00	1.00	1.00	1.00
HAVEN %	0.29**	0.20	0.03	0.17	0.23	0.33	1.00
LOGHAVEN	1.31**	0.57	0.69	0.69	1.10	1.79	2.64
Control variables							
BIG4	0.96**	0.20	0.00	1.00	1.00	1.00	1.00
SIZE	6.86**	1.79	1.54	5.64	6.82	8.09	10.80
MTB	3.20**	3.84	0.27	1.25	2.11	3.62	26.80
NOL	0.35**	0.48	0.00	0.00	0.00	1.00	1.00
CNOL	0.57*	0.49	0.00	0.00	1.00	1.00	1.00
ROA	0.01**	0.16	−0.89	−0.01	0.04	0.09	0.38
LEV	0.55**	0.28	0.07	0.36	0.53	0.69	1.76
ADV	0.01**	0.03	0.00	0.00	0.00	0.01	0.20
RD	0.05**	0.08	0.00	0.00	0.02	0.08	0.48
INTANG	0.31**	0.52	0.00	0.03	0.14	0.37	3.82
PPE	0.23	0.20	0.01	0.09	0.17	0.32	1.02
EQINC	0.00**	0.00	−0.01	0.00	0.00	0.00	0.03
SUBMAT	2.52**	1.86	1.00	1.50	2.00	2.88	35.75
FSR	0.39**	0.23	0.00	0.21	0.36	0.53	1.00
Alternative dependent variables							
LEVEL	3.05**	0.88	0.00	2.38	3.08	4.00	4.00

Table 1 (*Continued*)

	Mean	SD	Min	25th	Med	75th	Max
LEVEL_SALESWT	3.24**	0.74	0.02	2.75	3.31	4.00	4.00
NOMATCH %_NOTES	0.77**	0.29	0.00	0.50	1.00	1.00	1.00
LEVEL_NOTES	2.49**	1.11	0.00	1.75	2.25	4.00	4.00
LEVEL_SALESWT_NOTES	2.75**	1.01	0.01	2.06	2.77	4.00	4.00
NGEO_NOTES (−1)	−2.79**	2.03	−26.00	−3.00	−2.00	−1.00	−1.00

Panel A (Panel B) provides descriptive statistics for firm-years without (with) tax havens. The sample period is from 1998 to 2010 for 12,046 firm-year observations that have Exhibit 21 and Compustat geographic data. Please refer to Appendix 1 for sample selection criteria. Dependent variables, independent variables, and control variables are defined in Appendix 2. All tax-haven variables in Panel A have values of 0, by definition, but we show these for clarity. **, * Indicates that the mean for *DHAVEN* = 1 observations (Panel B) is significantly different from the mean of *DHAVEN* = 0 observations (Panel A) at the 0.05, 0.01 level.

EMPIRICAL RESULTS

Descriptive statistics

Table 1 reports the descriptive statistics for the sample of 12,046 firm-year observations of all firms with available Exhibit 21 and geographic disclosures. Panel A (Panel B) presents the statistics for firms without (with) tax havens. Consistent with prior studies (e.g., CTJ, 2015), approximately 66% of firm-years report at least one subsidiary in a tax haven. The results show that firms with tax havens are more likely *not* to have country-level geographic disclosures in the segment note that corresponds to country-level subsidiaries in Exhibit 21 (*NOMATCH%* = 92% vs. 70%). These results are consistent with firms with tax havens being more likely to make less transparent their geographic disclosures. Comparison of control variables shows that tax-haven firms are more likely to: employ a Big 4 auditor (*BIG4*), be larger (*SIZE*), have greater expected growth (*MTB*), be profitable (lower *NOL* and higher *ROA*), and have more foreign sales (*SUBMAT* and *FSR*).

Table 2 presents the correlation matrix of the variables used in the regression models. The Pearson correlations are in the top right and the Spearman correlations are in the bottom left. Using the full sample of observations, we first note that the tax-haven variables (*DHAVEN*, *HAVEN%*, and *LOGHAVEN*) positively correlate with one another and with the disclosure aggregation variable (*NOMATCH%*). These results are consistent with our hypothesis. The tax-haven variables are, however, significantly negatively correlated with the less precise measure of geographic disclosure aggregation based on a simple count of the number of geographic areas disclosed [*NGEO_NOTES(−1)*].

Hypothesis tests

Our hypothesis predicts that geographic disclosure aggregation is increasing in the use of tax havens. The results are reported in Table 3. In the first column, the coefficient on *DHAVEN* is significantly positive (0.176, *t*-stat = 12.6) and suggests that firm-years with a tax haven aggregate 17.6% more of their Exhibit 21 foreign countries than do non-haven firm-years. *HAVEN%* is also significantly positive (0.215, *t*-stat = 7.5). As the proportion of operations in tax havens increases, firms are more likely to aggregate country-level foreign operations. For example, a 10% increase in the proportion of haven countries is associated with a 2.15% increase in the proportion of countries that are aggregated. Finally, in the last column, *LOGHAVEN* is also positive and significant (0.116, *t*-stat = 13.2). Overall, the results in Table 3 are consistent with our hypothesis and provide evidence consistent with managers aggregating the disclosure of foreign operations in the presence of tax havens. These results relate to concerns by politicians and citizens groups that firms attempt to conceal their tax-avoidance activities through geographic disclosure aggregation.

As for control variables, we find the most consistent evidence for *SIZE*, *PPE*, and *SUBMAT*. Large firms tend to disclose more of their foreign operations at an aggregated level. In contrast, firms with high investments in property, plant, and equipment tend to disclose foreign operations at a more disaggregated level. Material foreign operations are also more likely to be disaggregated. This is consistent with firms complying, at least partially, with the geographic reporting requirements.

Table 2 Correlation matrix

Variable	A	B	C	D	E	F	G	H	I	J	K	L
A. NOMATCH %		0.35	0.18	0.34	0.09	0.22	0.06	**−0.01**	−0.02	0.08	−0.07	0.05
B. DHAVEN	0.14		0.64	0.80	0.09	0.31	0.05	−0.05	−0.02	0.09	**0.01**	0.03
C. HAVEN %	0.13	0.84		0.49	0.03	0.10	0.02	−0.04	−0.02	**0.01**	0.06	0.03
D. LOGHAVEN	0.14	0.84	0.73		0.12	0.46	0.08	−0.04	−0.02	0.11	0.05	0.05
E. BIG4	0.05	0.09	0.05	0.11		0.17	0.04	**0.00**	−0.03	**0.00**	0.03	0.00
F. SIZE	0.12	0.32	0.21	0.47	0.18		0.31	−0.04	−0.03	0.21	0.08	0.05
G. MTB	0.09	0.09	0.05	0.14	0.05	0.52		**−0.01**	**−0.01**	0.02	**0.00**	0.08
H. NOL	**0.01**	−0.05	−0.05	−0.04	0.00	−0.04	−0.03		0.65	−0.02	**0.00**	**−0.01**
I. CNOL	**−0.01**	−0.02	−0.03	−0.02	−0.03	−0.03	−0.01	0.65		0.00	−0.03	**0.01**
J. ROA	0.04	0.13	0.10	0.17	0.06	0.48	0.38	−0.06	0.01		−0.33	−0.08
K. LEV	−0.03	0.09	0.06	0.16	0.09	0.21	0.00	0.02	0.01	0.02		0.05
L. ADV	0.09	0.02	**0.01**	0.02	−0.04	0.04	0.08	**−0.01**	0.02	0.00	−0.06	
M. RD	0.09	0.03	**0.01**	**0.00**	**−0.01**	−0.07	0.20	**0.01**	0.03	−0.11	−0.05	0.10
N. INTANG	0.05	0.07	**0.01**	0.13	0.02	0.21	0.04	**−0.01**	0.02	0.09	0.33	0.09
O. PPE	−0.07	0.04	0.02	0.08	0.10	0.22	**0.01**	0.03	**0.00**	0.10	0.42	−0.15
P. EQINC	−0.02	0.07	0.02	0.11	0.04	0.17	0.02	**0.01**	**0.00**	0.14	0.09	−0.05
Q. SUBMAT	−0.08	0.26	0.15	0.42	0.09	0.34	−0.01	−0.05	−0.03	0.11	0.20	−0.07
R.FSR	−0.16	0.24	0.15	0.28	0.03	0.06	0.05	**0.00**	0.03	**−0.01**	0.05	−0.06
S. LEVEL	0.57	0.25	0.20	0.27	0.07	0.21	0.06	−0.02	**−0.01**	0.08	0.03	0.08
T. LEVEL_SALESWT	0.58	0.20	0.17	0.22	0.05	0.17	0.05	**−0.01**	**−0.01**	0.07	0.04	0.08
U. NOMATCH %_NOTES	0.90	0.09	0.07	0.08	0.03	0.09	0.08	0.02	**0.00**	0.03	−0.04	0.10
V. LEVEL_NOTES	0.79	0.12	0.09	0.11	0.04	0.14	0.07	**0.00**	**−0.01**	0.06	−0.02	0.13
W. LEVEL_SALESWT_NOTES	0.75	0.08	0.06	0.07	0.03	0.09	0.05	**0.01**	**0.00**	0.04	**−0.01**	0.12
X. NGEO_NOTES (−1)	0.42	−0.17	−0.12	−0.16	**−0.01**	−0.03	−0.03	0.02	**0.00**	**−0.01**	−0.02	0.10

Variable	M	N	O	P	Q	R	S	T	U	V	W	X
A. NOMATCH %	**−0.01**	**0.01**	−0.13	0.02	−0.02	−0.05	0.78	0.75	0.76	0.66	0.62	0.22
B. DHAVEN	−0.06	**0.01**	−0.03	0.05	0.13	0.20	0.33	0.30	0.12	0.14	0.10	−0.15
C. HAVEN %	0.03	**−0.01**	**0.01**	0.03	0.00	0.10	0.18	0.18	0.06	0.07	0.06	−0.08
D. LOGHAVEN	−0.10	0.05	**−0.01**	0.09	0.33	0.23	0.34	0.31	0.10	0.12	0.08	−0.14
E. BIG4	0.02	**0.01**	0.04	0.02	0.06	0.02	0.08	0.07	0.04	0.04	0.03	**0.00**
F. SIZE	−0.08	0.11	0.09	0.15	0.26	0.04	0.23	0.19	0.12	0.15	0.10	−0.04
G. MTB	0.13	−0.03	−0.03	**0.01**	−0.02	**0.01**	0.05	0.05	0.06	0.05	0.05	−0.01
H. NOL	0.02	**−0.01**	0.05	**0.00**	**0.00**	**0.00**	−0.02	**−0.01**	0.02	**0.00**	**0.01**	**0.01**
I. CNOL	−0.01	**0.00**	0.02	−0.02	**0.00**	0.03	**−0.01**	**−0.01**	**0.00**	**−0.01**	**0.00**	**−0.01**
J. ROA	−0.56	−0.20	−0.22	0.30	0.06	−0.06	0.08	0.04	0.06	0.06	0.02	**−0.01**
K. LEV	0.27	0.28	0.45	**0.01**	0.15	**0.01**	−0.04	**−0.01**	−0.04	−0.02	**0.00**	0.02
L. ADV	0.04	0.12	0.00	−0.03	−0.01	−0.05	0.08	0.07	0.07	0.11	0.10	0.09
M. RD		0.24	0.13	−0.11	−0.15	0.14	−0.07	−0.05	**−0.01**	−0.05	−0.03	−0.04
N. INTANG	0.02		0.17	−0.04	0.08	0.00	0.03	0.04	0.03	0.05	0.06	0.03
O. PPE	−0.05	0.06		0.08	0.09	0.07	−0.09	−0.06	−0.13	−0.11	−0.08	−0.04
P. EQINC	−0.11	**0.01**	0.11		0.13	**0.00**	0.03	0.03	−0.02	**−0.01**	−0.02	−0.05
Q. SUBMAT	−0.28	0.17	0.12	0.15		0.07	0.03	0.06	−0.08	−0.05	−0.03	−0.05
R.FSR	0.31	**0.00**	0.05	**0.01**	0.09		−0.14	−0.03	−0.22	−0.30	−0.19	−0.42
S. LEVEL	−0.06	0.09	−0.03	0.04	0.07	−0.20		0.93	0.52	0.75	0.67	0.34
T. LEVEL_SALESWT	−0.06	0.09	−0.03	0.03	0.06	−0.16	0.95		0.52	0.72	0.75	0.38
U. NOMATCH %_NOTES	0.06	0.05	−0.09	−0.04	−0.08	−0.22	0.44	0.46		0.85	0.83	0.43
V. LEVEL_NOTES	**−0.01**	0.08	−0.09	−0.02	−0.03	−0.29	0.74	0.74	0.86		0.94	0.55
W. LEVEL_SALESWT_NOTES	**0.00**	0.07	−0.09	−0.03	−0.04	−0.23	0.69	0.76	0.83	0.95		0.59
X. NGEO_NOTES (−1)	−0.18	0.02	−0.06	−0.05	−0.07	−0.49	0.53	0.58	0.47	0.64	0.68	

The table shows the correlation between the variables using the full sample of 12,046 firm-year observations. Pearson correlations are reported on the top right and Spearman correlations on the bottom left. All correlations are significant at least the 10% level except the correlations in bold. See Appendix 2 for variable definitions.

Additional tests

Cross-sectional tests

The incentives to aggregate geographic disclosures when operating in tax havens may differ across firms. Recall that the main argument is that managers intentionally aggregate geographic disclosures to prevent scrutiny by regulators, tax-watchdog groups, the media, consumers, foreign regulators, and competitors. An implication of this argument is that this type of scrutiny is costly for the firm. We use the following model to investigate

Table 3 Relation between geographic aggregation and tax-haven intensity

Variables	Coef.	*t*-stat.	Coef.	*t*-stat.	Coef.	*t*-stat.
DHAVEN	0.176***	12.597				
HAVEN %			0.215***	7.488		
LOGHAVEN					0.116***	13.164
BIG4	0.034	1.387	0.039	1.519	0.038	1.530
SIZE	0.032***	8.392	0.048***	12.228	0.024***	5.702
MTB	0.001	1.194	0.001	1.407	0.000	0.479
NOL	0.019*	1.818	0.016	1.496	0.016	1.510
CNOL	−0.012	−1.548	−0.010	−1.244	−0.011	−1.346
ROA	0.003	0.132	0.000	0.006	0.016	0.663
LEV	−0.058***	−3.168	−0.057***	−3.097	−0.059***	−3.298
ADV	0.173	1.323	0.177	1.287	0.153	1.153
RD	0.204***	3.107	0.223***	3.385	0.197***	3.070
INTANG	0.001	0.168	0.002	0.273	−0.001	−0.147
PPE	−0.140***	−4.573	−0.156***	−4.828	−0.135***	−4.405
EQINC	0.540	0.537	0.492	0.465	0.391	0.390
SUBMAT	−0.014***	−4.371	−0.012***	−3.669	−0.022***	−6.215
Constant	0.541***	7.323	0.514***	6.408	0.635***	8.338
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
N	12,046		12,046		12,046	
Adjusted R^2	0.183		0.139		0.177	

This table presents results from regressing *NOMATCH%* on each of three tax-haven measures and control variables using 12,046 firm-year observations from 1998 to 2010. For each regression, the estimated coefficients are presented in the first column and the two-sided t-statistics in the second column. Please refer to Appendix 1 for sample selection criteria and Appendix 2 for variable definitions. Standard errors are clustered by firm. ***, **, and * indicate significance (two-tailed) at the 1, 5 and 10% levels, respectively.

whether such costs affect the relation between geographic disclosure aggregation and tax-haven operations.

$$\begin{aligned} NOMATCH\%_{i,t} = {} & \alpha_0 + \alpha_1 DHAVEN_{i,t} + \alpha_2 DSIZE_{i,t} \\ & + \alpha_3 DSIZE_{i,t} \times DHAVEN_{i,t} \\ & + \alpha_4 NATURAL_{i,t} + \alpha_5 NATURAL_{i,t} \\ & \times DHAVEN_{i,t} + \alpha_6 RETAIL_{i,t} \\ & + \alpha_7 RETAIL_{i,t} \times DHAVEN_{i,t} \\ & + \alpha_8 LOWCOMP_{i,t} \\ & + \alpha_9 LOWCOMP_{i,t} \times DHAVEN_{i,t} \\ & + \beta_n Controls_{n,i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Model (2) includes the interactions of four variables with *DHAVEN*. Each of these variables provides a measure of potential costs associated with revealed operations in tax havens. Thus, we expect the positive relation between *DHAVEN* and *NOMATCH%* to increase further with each of these costs ($\alpha_3 > 0$).

The first variable (*DSIZE*) proxies for political cost. *DSIZE* equals 1 (0 otherwise) for firms with total assets above the annual median. We expect large firms to be more visible and therefore be more susceptible to political costs (Zimmerman, 1983). For example, the Congress-commissioned 2008 GAO report on firms' use of tax havens and foreign subsidiaries focused on the largest 100 corporations (GAO, 2008).

A second cost of tax-haven operations relates to the nature of foreign activities in which the firm engages. Citizens groups heavily target firms that exploit the natural resources of poor foreign countries. The perception is that these poor nations are deprived of significant amounts of tax revenues needed to support health services, education, shelter, and public infrastructure. The natural-resources industry has been specifically targeted by regulatory reforms (e.g., Extractive Industry Transparency Initiative of 2003 and Section 1504 of the Dodd–Frank Act of 2010) and citizen groups. We expect that firms in natural-resources industries are more likely to aggregate their geographic disclosures when they have operations in tax havens. *NATURAL* equals 1 (0 otherwise) for firms in natural-resources industries, defined as those with SIC codes 100–1499 or 2900–2999.

A third cost arises from the possibility of consumer boycott (e.g., Austin & Wilson, 2013). Even if companies' tax practices are legal, individuals may

feel that companies do not comply with the spirit of the law, and their tax practices hinder social welfare (Shah, 1995; Cooper, Dacin, & Palmer, 2013). Therefore, we expected companies that engage primarily in business-to-consumer transactions (such as the retail industry) are more likely to aggregate their geographic disclosures when they have operations in tax havens. *RETAIL* equals 1 (0 otherwise) for firms in retail industries, defined as those with SIC codes 5000–5999.

Our final cost relates to competition. Several studies support the finding that firms with *fewer* existing competitors provide more aggregated segment disclosure (Harris, 1998; Botosan & Stanford, 2005, Lail, Thomas, & Winterbotham, 2014). These studies conclude that firms facing less competition attempt to conceal abnormal profitability and high market share by aggregating segment disclosures. Other research suggests that lower competition worsens disclosure quality because of reduced governance (Hart 1983; Balakrishnan & Cohen, 2014). We expect firms in less competitive industries are more likely to aggregate their geographic disclosures when they have operations in tax havens. To measure competition, we use the product-differentiation measure developed by Hoberg & Phillips (2010, 2016). *LOWCOMP* equals 1 (0 otherwise) for firms with product-differentiation scores above the median.

Results for model (2) in Table 5 are shown separately for each test variable and in a combined model. The main effect of *DHAVEN* remains positive and significant for each specification, suggesting that the cross-sectional variables do not completely explain the observed greater aggregation for firms with tax-haven use. We find evidence that larger firms and firms in natural-resources industries, in retail industries, or with low competition are incrementally more likely to aggregate their geographic disclosures when having tax-haven operations. The results for these cross-sectional tests also provide additional credibility to the findings reported for the main hypothesis. That is, we find that the results are significantly more pronounced in the subsamples for which theory and prior research predict that the findings should be more relevant.

Changes analyses

Our multivariate tests include numerous controls for determinants of variation in voluntary disclosure levels as well as potential determinants of the use of tax havens. These controls are motivated by prior research. However, to further alleviate concerns regarding possible omitted variables and to be able to make somewhat stronger arguments regarding causality, we also implement changes analyses. Note that a caveat of a changes test in our setting is the relatively limited year-over-year changes in both the test and dependent variables. However, given that we have a large sample, such tests are still feasible. In Table 4, we first find that the change in *HAVEN%* (0.147; *t*-stat = 11.3) and the change in *LOGHAVEN* relate positively to the change in *NOMATCH%* (0.055, *t*-stat = 11.6).

Next, we examine unique samples of firms. The first sample includes firms that add at least one *tax-haven subsidiary* in year *t* ($N = 324$), and the second sample includes firms that add at least one *non-tax-haven subsidiary* in year t in a new country ($N = 184$). For both samples, we require the firm to have no tax-haven subsidiaries in year $t - 1$. The purpose of these samples is to compare the impact on aggregation of adding a subsidiary. The increase in aggregation after adding a subsidiary is potentially mechanical. That is, holding constant the number of geographic segments disclosed, an increase in the number of subsidiary countries automatically leads to higher aggregation. If this is the case, then we expect both samples to show equal evidence that an increase in subsidiaries leads to an increase in aggregation. We estimate model (1) and find (in untabulated analyses) that an indicator variable for firms adding their first tax-haven subsidiary in year t relates *positively* to the change in *NOMATCH%* (0.074, *t*-stat = 5.2). In contrast, an indicator variable for firms adding a non-tax-haven subsidiary in year *t* (with no tax haven in year $t - 1$) relates *negatively* to the change in *NOMATCH%* (−0.073, t-stat = − 4.0). Thus, adding a tax-haven subsidiary has a distinct effect on increasing aggregation compared to adding a non-tax-haven subsidiary. The evidence is consistent with firms' intention to make tax-haven operations less transparent through disclosure aggregation.

As a final test of changes, we define a new indicator variable that equals 1 when a firm has a change from *DHAVEN* = 0 to *DHAVEN* = 1. We find that this new indicator variable relates *positively* to the change in *NOMATCH%* (0.070; $t = 4.691$). In addition, we conduct a similar test by defining an indicator variable that equals 1 when a firm has a change from *DHAVEN* = 1 to *DHAVEN* = 0. We find that this variable relates *negatively* to the change in *NOMATCH%* (−0.078; $t = -4.134$). Both sets of results are consistent with the hypothesis that managers are motivated by tax-haven intensity to aggregate their geographic disclosures.

Table 4 Relation between changes in geographic aggregation and changes in tax-haven intensity

Variables	Coef.	*t*-stat.	Coef.	*t*-stat.
Δ*HAVEN %*	0.147***	11.343		
Δ*LOGHAVEN*			0.055***	11.571
Δ*BIG4*	−0.007	−0.728	−0.007	−0.742
Δ*SIZE*	0.012**	2.288	0.009*	1.781
Δ*MTB*	0.000	0.077	0.000	0.128
Δ*NOL*	−0.006	−1.354	−0.007	−1.445
Δ*CNOL*	−0.002	−0.598	−0.002	−0.626
Δ*ROA*	−0.002	−0.282	0.000	0.026
Δ*LEV*	0.001	0.067	−0.002	−0.210
Δ*ADV*	0.176	1.079	0.141	0.866
Δ*RD*	0.099*	1.752	0.086	1.525
Δ*INTANG*	0.022**	2.105	0.020*	1.925
Δ*PPE*	0.008	0.330	−0.002	−0.061
Δ*EQINC*	0.465	0.985	0.415	0.881
Δ*SUBMAT*	−0.002	−1.233	−0.004**	−2.208
Constant	−0.057***	−4.219	−0.059***	−4.336
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
N	9,401		9,401	
Adjusted R^2	0.025		0.026	

This table presents results from regressing the change in *NOMATCH%* on either the change in *HAVEN%* or the change in *LOGHAVEN* and control variables. For each regression, the estimated coefficients are presented in the first column and the two-sided *t*-statistics in the second column. The sample is smaller than the primary sample described in Appendix 1 due to the additional requirement that changes in variables be available. Please refer to Appendix 2 for variable definitions. Standard errors are clustered by firm. ***, **, and * indicate significance (two-tailed) at the 1, 5 and 10% levels, respectively.

Alternative measures of geographic disclosure aggregation

In this section, we examine the relation between additional measures of geographic disclosure aggregation and tax-haven intensity. First, we focus on the *level* (or degree) of geographic disclosure aggregation of individual countries in Exhibit 21. We assign an individual *LEVEL* score to each country in which the firm has subsidiaries. *LEVEL* increases incrementally from 0 (country-level disclosure) to 4 (total foreign aggregation). We then take the average score across all individual countries to calculate the firm-year *LEVEL* score to be used in the regression analyses. See Appendix 2 for details. Compared with *NOMATCH%*, *LEVEL* potentially allows for richer interpretation of the extent to which tax-haven operations motivate managers to aggregate their geographic disclosures beyond the country level (e.g., groups of countries, subcontinents, continents, regions, and total foreign). As the aggregation level increases, country-specific operations become less transparent.

We also use a sales-weighted measure of *LEVEL* to measure aggregation (*LEVEL_SALESWT*). *LEVEL_SALESWT* is similar to *LEVEL* except that it weights each disclosed geographic area by the proportion of sales relative to total foreign sales. Thus, the aggregation level of larger geographic areas is more heavily weighted in the firm's overall aggregation score. In contrast, *LEVEL* provides a simple average aggregation across all countries disclosed in Exhibit 21.

The other three alternative measures of geographic disclosure aggregation are based solely on the geographic disclosures in the notes to the financial statements (i.e., there is no consideration of the list of subsidiaries provided in Exhibit 21). The first of these measures is the mean aggregation scores of geographic areas disclosed (*LEVEL_NOTES*). For example, suppose a firm discloses three geographic areas that have *LEVEL* scores as outlined in Appendix 2 – Mexico (0.0), Germany/Ireland (0.5), Asia (1.5), and Africa/Middle East (2.0). In this example, *LEVEL_NOTES* equals 1.0, the average of four geographic areas. *LEVEL_SALESWT_NOTES* is measured the same as *LEVEL_NOTES* except the average is geographic sales-weighted. Finally, *NOMATCH%_NOTES* is the proportion of non-country-specific geographic areas disclosed. From the example above, *NOMATCH%_NOTES* equals 0.75 (only Mexico is a country-specific area).

Table 5 Cross-sectional tests of the relation between geographic aggregation and tax-haven intensity

Variables	Coef.	Coef.	Coef.	Coef.	Coef.
DHAVEN	0.132***	0.179***	0.171***	0.177***	0.093***
DSIZE	−0.044				−0.025
DSIZE* × *DHAVEN	**0.077*** **				**0.052***
NATURAL		−0.188**			−0.202**
NATURAL* × *DHAVEN		**0.165***			**0.175****
RETAIL			−0.176***		−0.176***
RETAIL* × *DHAVEN			**0.151*** **		**0.145*** **
LOWCOMP				−0.056**	−0.056**
LOWCOMP* × *DHAVEN				**0.070*** **	**0.067*** **
BIG4	0.039	0.036	0.037	0.037	0.033
SIZE	0.029***	0.029***	0.031***	0.029***	0.030***
MTB	0.001	0.001	0.001	0.001	0.001
NOL	0.015	0.014	0.016	0.015	0.017
CNOL	−0.010	−0.008	−0.011	−0.010	−0.009
ROA	0.018	0.017	0.015	0.020	0.020
LEV	−0.059***	−0.061***	−0.063***	−0.056***	−0.056***
ADV	0.258**	0.240*	0.264**	0.257**	0.254**
RD	0.258***	0.257***	0.235***	0.258***	0.210***
INTANG	0.024	0.022	0.020	0.025	0.018
PPE	−0.146***	−0.119***	−0.161***	−0.152***	−0.128***
EQINC	0.375	0.251	0.489	0.426	0.272
SUBMAT	−0.016***	−0.016***	−0.015***	−0.015***	−0.015***
Constant	0.661***	0.639***	0.652***	0.666***	0.700***
Year FE	Yes	Yes	Yes	Yes	Yes
N	12,046	12,046	12,046	12,046	12,046
Adjusted R^2	0.170	0.172	0.175	0.170	0.186

This table presents results from regressing *NOMATCH%* on *DHAVEN*, the interaction of *DHAVEN* with each of three cross-sectional measures of disclosure cost, and control variables using 12,046 firm-year observations from 1998 to 2010. For each regression, the estimated coefficients are presented. *DSIZE* equals 1 (0 otherwise) for firms with assets above the annual median. *NATURAL* equals 1 (0 otherwise) for firms in natural-resource industries, defined as those with SIC codes 100–1499 or 2900–2999. *RETAIL* equals 1 (0 otherwise) for firms in retail industries, defined as those with SIC codes 5000–5999. *LOWCOMP* equals 1 (0 otherwise) for firms with high product differentiation as defined by Hoberg & Phillips (2010, 2016). High ratios are defined as those above the median. We do not include industry fixed effects as the regressions contain *NATURAL* and *RETAIL*. Please refer to Appendix 1 for sample selection criteria and Appendix 2 for other variable definitions. Standard errors are clustered by firm. ***, **, and * indicate significance (two-tailed) at the 1, 5 and 10% levels, respectively.

We find that results for *LEVEL* and *LEVEL_SALESWT* (based on Exhibit 21 data) are positive and highly significant. For the other three measures based on geographic note disclosures only (*LEVEL_NOTES*, *LEVEL_SALESWT_NOTES*, and *NOMATCH%_NOTES*), the results are also positive and significant, but these coefficients and t-statistics are smaller than those based on Exhibit 21 data. Thus while simpler measures based on note disclosures provide robust conclusions, there appears to be greater noise in these measures. This validates our use of Exhibit 21 data to develop a measure of geographic disclosure aggregation. Exhibit 21 data provide the advantage of measuring disclosure aggregation based on what managers could have revealed.

Next, we test a measure of disclosure aggregation used more commonly in the literature. This measure is the number of geographic areas disclosed, multiplied by −1 [*NGEO_NOTES(−1)*]. We multiply the measure by −1 so that higher values represent greater aggregation, consistent with our measurement of *NOMATCH%*. The simple assumption is that a greater number of geographic segments disclosed represents less aggregation (or, because we multiply by −1, a higher measure of *NGEO_NOTES(−1)* represents more aggregation). The purpose of this test is to determine the difference in inferences (if any) if we simply use a count of the number of geographic areas disclosure as our measure of aggregation.

The results from regressing *NGEO_NOTES(−1)* on all three measures of tax-haven are *opposite* to those shown in Table 3. That is, the estimated parameters are significantly negative, indicating that firms with greater tax-haven operations report less aggregated geographic disclosures. The result for

NGEO_NOTES(−1) underscores the importance of evaluating disclosure quality based on the information that *could* have been disclosed rather than simply what is disclosed. It also cautions researchers that a simpler measure such as the number of geographic segments may lead to erroneous inferences in some settings.

Immateriality of tax havens

ASC 280 allows immaterial countries to be aggregated. Thus, one might expect that a firm with operations in a smaller country would, on average, be more likely to aggregate that country. Given that tax havens tend to be smaller countries, our findings may be an artifact of disclosure requirements rather than managers' attempt to make geographic operations less transparent. In this section, we address the immateriality of tax havens in two ways. First, we compare firms' geographic aggregation based on having operations in matched "tax haven-like" countries to determine whether tax havens provide a unique effect on disclosure aggregation. Second, we use only non-tax haven counties to compute our aggregation score so that immateriality of tax havens cannot affect the analysis.

Our matching test is as follows: For each of the 45 tax havens in our sample, we calculate the number of firm-year-country observations in Exhibit 21 over our sample period. We then match the tax haven with a non-tax-haven country that has the closest number of firm-year observations. This procedure creates a sample of countries that are similar to tax havens in terms of frequency with which MNCs have subsidiary operations, but these matched countries are not expected to face the same pressure to conceal tax avoidance. We then calculate corresponding measures for this matched group (*DHAVEN_MATCH*, *HAVEN%_MATCH*, and *LOGHAVEN_MATCH*). For example, *DHAVEN_MATCH* = 1 if the firm has operations in at least one of the 45 matched non-tax-haven countries.

Each of the *MATCH* variables is added in the test of model (1) along with its corresponding haven measure. Untabulated results reveal that all of the tax-haven measures remain positive and significant, continuing to provide evidence consistent with our hypothesis (e.g., the coefficient on *DHAVEN* is significantly positive). More importantly, the tax-haven coefficients are significantly more positive than the coefficients on the corresponding *MATCH* variables (e.g., the coefficient on *DHAVEN* is significantly more positive than the coefficient on *DHAVEN_MATCH*). Thus, we conclude that firms with operations in tax havens show incremental evidence of aggregation compared to firms with operations in countries with similar frequency of subsidiary location. The incremental aggregation of geographic disclosures for firms with tax havens is attributed to managers' attempts to avoid strong criticisms related to MNCs' income shifting practices (rather than aggregation due to immateriality of operations). As an additional test of immateriality, we also match each tax haven with a non-tax haven using country Gross Domestic Product and repeat the tests above. Inferences are unaffected.

An additional possibility is that tax havens never meet the materiality disclosure threshold because they involve primarily financial flows. The lack of materiality could induce an automatic mismatch between the number of legal entities and the number of geographic segments that constitute material operating activities. We address this potential concern by calculating aggregation based on *non-tax-haven countries only*. In other words, we exclude tax-haven countries in our measure of *NOMATCH%* so that they cannot influence our aggregation score. We find that the extent of tax-haven operations relates positively to aggregation of non-tax-haven countries. As we discussed previously, to the extent that managers perceive costs from criticisms related to tax-avoidance activities, these managers have incentives to use discretion in geographic disclosures to make income shifting activities less transparent. Aggregation of non-tax-haven countries from which income is being shifted is consistent with this prediction.

Other robustness tests related to tax havens

We assess the sensitivity of our findings to the definition of tax havens (other than materiality which we test for above). Although we use a standard source for identifying countries as tax havens as used in prior literature, some of the countries classified as tax havens are also clearly "legitimate" places to do business for reasons other than tax minimization. Perhaps most importantly, firms have subsidiaries in Hong Kong to service their East-Asia operations (and in particular China) and in Singapore to service Southeast-Asia clients. Thus, in robustness tests, we exclude Hong Kong and Singapore and rerun the analyses. No inferences are affected. We also provide tests that exclude Hong Kong, Singapore, Ireland, and the Netherlands. Again, conclusions remain unaltered.

In our primary analysis, we rely on the definition of a tax haven as provided by Dyreng & Lindsey (2009). As a sensitivity test, we limit the definition of tax havens to those on their list that have tax rates below 20%. These tax havens are particularly useful in helping firms to avoid taxes and managers may be particularly concerned about criticisms of operating in these countries. Our results using this modified list of tax havens are stronger than those we currently report.

Further controls for firm size

A possible reason for the positive relation between aggregation scores and tax-haven subsidiaries is firm size. Larger firms tend to operate in more countries, making it less likely that any particular country represents material operations and is therefore more likely to be aggregated in geographic disclosures. In addition, larger firms are more likely to have legal resources available to structure complex business transactions in tax havens. The Pearson correlation between *SIZE* and *NOMATCH%* in Table 2 is 0.22. The correlation between *SIZE* and *DHAVEN* (*HAVEN%*) [*LOGHAVEN*] is 0.31 (0.10) [0.46]. Thus although we control for firm size in all analyses, the relation between disclosure aggregation and tax havens potentially represents a size-related bias.

To provide further control for firm size, we partition the full sample into ten equal-sized deciles. Thus, there is little variation in firm size across firms *within* each decile, especially deciles 2 through 9. For each of the ten deciles, we estimate model (1) and continue to observe a positive relation between aggregation scores and all measures of tax havens. Thus, it seems unlikely that our results mechanically relate to firm size.

Operating segments

We consider whether the firm reports operating segments on a geographic basis or industry basis. ASC 280 requires disclosure of operating segments based on management's internal organization of the firm. If the firm's internal reporting structure is based on industry, then the firm is required to provide entity-wide disclosure of geographic operations, but the entity-wide disclosures do not require the same level of detail. Thus to the extent managers may wish to hide the structuring of transactions through tax havens, they would likely opt to report operating segments on an industry basis. We estimate that 96.4% of our sample observations report operating segments on an industry basis. For the 3.6% of observations that report their operating segments on a geographic basis, we expect these firms to have strong incentives to aggregate disclosures as tax-haven intensity increases.

We separately test our hypothesis for each sample. For both samples, we document a significantly positive relation between *DHAVEN* and *NOMATCH%*. The coefficient for the sample disclosing operating segments on a geographic basis is higher (0.243 versus 0.172), but the *t*-statistic is lower (4.163 versus 12.281). The lower statistical power is almost certainly due to the smaller sample size ($N = 438$) affecting the power of the test. The results, however, are consistent with disclosure aggregation being more sensitive to tax-haven operations when firms disclose operating segments on a geographic basis.

CONCLUSION

According to data published by the US Bureau of Economic Analysis, in 1998 US multinationals reported 13.1% of their total foreign earnings in the tax havens of Ireland, Luxembourg, Bermuda, and UK Islands/Caribbean. This percentage grew to 25.7% by 2010. In comparison, profits in Canada, Germany, the UK, and Mexico were 31.2% in 1998 but fell to 16.6% by 2010. Shifting in foreign profits from non-tax havens to tax havens has received criticism from the popular press, parent- and host-country governments of multinationals, and civil-society organizations around the world. Our study contributes by using a novel measure of geographic disclosure aggregation, based on hand-coded data, and shows how the level of aggregation relates to an economically important issue: the use of tax havens by US multinationals.

Our main findings are as follows. Firms that operate more extensively in tax havens tend to disclose their foreign operations at a higher level of aggregation. The evidence is consistent with managers attempting to avoid criticisms of their firms' tax-avoidance practices by making geographic disclosures less transparent. Multinationals have the incentive to hide these activities because increased transparency may provoke public scrutiny from the media, policymakers, and tax-watchdog groups. Such scrutiny can damage the firm's reputation or serve as a red flag for potential government sanctions or additional regulation. We further find that the relation between tax havens and geographic disclosure aggregation is greater for larger firms or

firms in natural-resources industries, in retail industries, or with low competition. These firms potentially face greater costs from their tax-avoidance activities being revealed. The conclusions are robust to a number of sensitivity analyses.

We acknowledge that our measure of aggregation has some limitations. First, we use the list of subsidiaries provided in each firm's Exhibit 21 as a benchmark for the information that could have been reported by country. This list is required by the SEC, but some suggest that this list could be susceptible to managers' manipulation. Second, our aggregation measure captures only the aggregation aspect of disclosure and provides limited information about the underlying precision of the information disclosed (although the sales-weighted measure partially captures this aspect). Third, if a firm is vertically integrated or if certain regions comprise fairly homogeneous countries, grouping operations that pertain to different countries do not necessarily imply a loss of information, yet the aggregation measures will be higher. In this case, measures of disclosure aggregation will understate the informativeness of disclosure.

Overall, we conclude that the findings are consistent with the suggestion of policymakers and civil-society organizations around the world that country-by-country reporting is needed to better highlight tax-avoidance activities of multinational companies. However, ASC 280 (or IFRS 8) offers little specific guidance on how firms define material countries for geographic reporting purposes. This latitude in the standard results in geographic aggregation being highly susceptible to managerial choice. A potential consequence of less transparent geographic disclosures is the ability of firms to better conceal their tax-avoidance behavior.

ACKNOWLEDGEMENTS

We appreciate comments from Gary Biddle (Editor), Alain Verbeke (Editor-in-Chief), two anonymous reviewers, Frances Ayres, Robert Duquette, David Folsom, Tamara Lambert, Stephen Lin (discussant), Yvonne Lu, Leila Peyravan, Jesus Salas, Barbara Su, Wuyang Zhao, and workshop participants at the University of Connecticut, Lehigh University, University of Oklahoma, Hong Kong Polytechnic University, Virginia Tech, Accounting Doctoral Students Association Conference, and International Accounting Section Midyear Meeting. This article received the Best Paper Award at the 2014 International Accounting Section Midyear Meeting. Hope acknowledges the financial support of the Deloitte Professorship.

NOTES

[1]The US Senate recently held hearings that highlighted several large multinationals that are alleged to be engaged in foreign income shifting. http://www.hsgac.senate.gov/subcommittees/investigations/media/subcommittee-hearing-to-examine_billions-of-dollars-in-us-tax-avoidance-by-multinational-corporations- and http://www.hsgac.senate.gov/subcommittees/investigations/media/subcommittee-to-examine-offshore-profit-shifting-and-tax-avoidance-by-apple-inc.

[2]New York Times (http://query.nytimes.com/search/sitesearch/#/multinationals), Tax Justice Network (http://www.taxjustice.net/cms/front_content.php?client=1&lang=1&parent=91&subid=91&idcat=144&idart=256), Publish What You Pay (2010) (http://www.publishwhatyoupay.org/about/advocacy/country-country-reporting), and UK Parliament (http://www.parliament.uk/search/results/?q=tax*avoidance).

[3]The OECD states (www.oecd.org/tax/beps-about.htm), "The final BEPS package gives countries the tools they need to ensure that profits are taxed where economic activities generating the profits are performed and where value is created, while at the same time gives business greater certainty by reducing disputes over the application of international tax rules, and standardising compliance requirements."

[4]In a December 2012 report, the IASB postponed country-by-country deliberations to a future unspecified date. http://www.internationaltaxreview.com/Article/3133003/IASB-rejects-new-accounting-standard-for-income-taxes-and-country-by-country-reporting.html. However, the European Parliament and the European Union have taken some steps to introduce country-by-country reporting requirements to banks and the extractive industry. They are deliberating on similar requirements for large multinationals in other industries (http://www.bloomberg.com/news/2013-05-23/eu-seeks-country-by-country-tax-disclosure-for-large-companies.html). Deloitte tracks updates on country-level reporting requirements (http://www.iasplus.com/en/resources/country-by-country-reporting). See also PWC (2012).

[5]There have been other instances in which standard setters improve disclosures in response to political and social pressures, such as environmental disclosures, executive compensation disclosures, and other disclosures related to specific situations (e.g., Section 1502 of the Dodd–Frank Act to disclose conflict minerals to

curb violence and human rights abuses in the Democratic Republic of Congo and its neighboring countries, Sect. 1504 of the Dodd–Frank Act to disclose payments to foreign governments by firms in the extractive industry, and Sect. 219 of the Iran Threat Reduction Act to disclose certain activities related to Iran). For an interesting perspective on the role of accounting standard setters, see Bayou, Reinstein, and Williams (2011).

[6]Hope and Thomas (2008) find that non-disclosure of geographic earnings relates to firms' propensity to engage in empire building (i.e., expansion of foreign sales accompanied by lower foreign profit margins and lower firm value).

[7]While companies are required to report total foreign profits and total foreign taxes, this information does not inform about which tax havens are being used to shift profits and from which counties those profits are being shifted. In addition, multinationals may have real operating reasons to conduct business in lower-tax jurisdictions. The lower foreign effective tax rate in this instance would not represent tax-avoidance activities through structured transactions typically associated with tax havens.

[8]A line of research concludes that providing disaggregated geographic information aids in forecasting future earnings (e.g., Balakrishnan, Harris, & Sen, 1990; Herrmann, 1996; Behn et al., 2002) and analyst forecast accuracy (Nichols, Tunnell, & Seipel, 1995) and that geographic segment disclosures are value relevant to investors (e.g., Boatsman et al., 1993; Thomas, 2000; Hope et al., 2009). Similar studies on disaggregation of business segments can be found. From these studies, we conclude that the literature provides evidence that aggregation represents a loss of information to financial statement users.

[9]For example, part of the OECD's definition of a tax haven is that it is a country with opaque rules.

[10]In 2012, Starbucks promised to pay $31 million after holding several hearings with the UK Parliament about paying their fair share of taxes in the UK (Huffingtonpost.com, 2012) http://www.huffingtonpost.com/2012/12/06/starbucks-uk-taxes_n_2249666.html.

[11]There is also prior research on corporate social responsibility (CSR) and tax avoidance (e.g., Hoi, Wu, & Zhang, 2013; Huseynov & Klamm, 2012) and our study is also indirectly related to this stream of literature.

[12]http://www.gao.gov/assets/290/284522.pdf.

[13]The sample begins in 1998 because a new reporting standard (ASC 280 or previously SFAS 131) took effect that year and ends in 2010 because this is the last year Exhibit 21 data are available from Scott Dyreng's website (https://sites.google.com/site/scottdyreng/Home/data-and-code). Exhibit 21 in the Form 10-K provides a list of the firm's material subsidiaries, as required by the SEC. The Exhibit 21 materiality benchmark is 10% of total assets, pre-tax income, or investment per individual subsidiary as well as per an aggregate of all non-individually disclosed subsidiaries. Hence all individually disclosed subsidiaries must constitute more than 90% of total assets, income, or investment (Item 601 of SEC Regulation S-K).

[14]Firms might have multiple subsidiaries in a single foreign country. However, only unique countries count as a firm-year-country observation.

[15]See Appendix 2 for a list of countries with tax-haven status.

[16]Because researchers cannot directly observe transactions used to shift income to avoid taxes, we rely on tax-haven intensity for three reasons. First, it is unlikely that many firms locate their operations in tax havens solely for economic motives related to productive inputs or customer location since most tax havens have very low populations. For example, 2005 Bureau of Economic Analysis data on US multinationals show that 45% of their profits were in Luxembourg, Bermuda, Ireland, Switzerland, and the Netherlands but these five low-tax countries have a combined population of less than two-thirds that of Spain (Clausing, 2009). Thus the ability to pay low taxes on shifted income is more likely a first-order motive. Second, the use of tax havens to proxy for tax-avoidance behavior is consistent with the literature (e.g., Higgins, Omer, & Phillips 2015). Like financial reporting rules, managers have some discretion and interpretation as to how tax rules are implemented (Garcia & Oats, 2012), and tax havens likely facility such discretion. Third, the media, tax-watch groups, and the SEC focus on tax havens as a major component of income-shifting schemes. Evidence using these proxies directly addresses their concerns.

[17]We "over-control" for firm size in Eq. (2) by including both (the main effects of) *SIZE* and *DSIZE* in the regression. Conclusions are not altered if we exclude *SIZE*.

[18]For example, firms with $NOL = 1$ or $CNOL = 1$ likely have reduced incentives to utilize the costlier tax-planning mechanism of operating in tax havens, but there is no clear link between geographic disclosure aggregation and *NOL* or *CNOL* (see correlations in Table 2 as validations of these expectations). If we instead use these variables in the first stage of a two-step approach to correct for potential selection bias in

DHAVEN, the results are very similar to those reported in the main tests.

[19]The results for *SUBMAT* are presented in the tables. The inferences are robust to controlling for materiality using *FSR*. We also considered controlling for materiality of countries using the number of countries. Results are very similar with this control variable added to the model.

[20]All continuous variables are winsorized at the 1st and 99th percentile to reduce the effects of outliers. Inferences are unaffected if we do not winsorize variables.

[21]There is no evidence of any serious multicollinearity in our multivariate analyses. Specifically, the highest variance inflation factor is 1.23.

[22]All regressions are estimated using a pooled cross-sectional time-series approach. Controls for year and industry fixed effects are included, and standard errors are clustered by firm. We choose firm clustering due to geographic disclosures and Exhibit 21 data being fairly constant across years within each firm. Untabulated analyses show that all conclusions are robust to clustering by year or by industry or by firm and year. Because *NOMATCH %* is measured as a proportion (from 0 to 1), we verify that the inferences are also robust to the fractional logit model proposed by Papke and Wooldridge (1996).

[23]For example, Christian Aid estimates that if lost tax resources were invested in health programs in developing countries, it would save the lives of 350,000 children annually (Christian Aid 2008 http://www.christianaid.org.uk/pressoffice/pressreleases/may2008/deathandtaxes.aspx).

[24]http://www.publishwhatyoupay.org/resources/piping-profits-secret-world-oil–gas-and-mining-giants

[25]An example of a recent consumer boycott is the online retailer Amazon by *Ethical Consumer* magazine. This call followed the revelation that Amazon is the UK's "number one tax avoider." Six members of the UK Parliament recently supported the call on shoppers to avoid buying goods from Amazon for Christmas (Blue & Green Investor 2013). See http://www.blueandgreentomorrow.com/2013/12/02/mps-support-amazon-christmas-boycott-over-tax-avoidance/. As another example, Starbucks announced plans to change its tax-avoidance practices in the UK in response to severe criticisms (www.cnbc.com/id/100282980).

[26]Consumers can also include governments. For example, in 2012 the city council of Helsinki (Finland's capital) voted to no longer do business with companies that operate in tax havens (www.globalissues.org/news/2012/10/06/14979). Reasons put forth by the council include the belief that these companies' activities undermine social programs, deprive developing countries of vital revenues, and distort fair competition between companies. Similar government boycotts have been made in other areas, such as the "tax-haven free zones" established in France.

[27]Other theoretical research provides similar arguments for the prediction that firms in less competitive industries will provide lower-quality disclosure (Darrough & Stoughton, 1990; Gigler, 1994). However, some empirical evidence exists which finds little evidence of a link between segment disclosure and competition (Botosan & Harris, 2000; Berger & Hann, 2007; Ali, Klasa, & Yeung 2009; and Bens, Berger, & Monahan, 2011).

[28]http://alex2.umd.edu/industrydata/industryconcen.htm.

[29]We obtain consistent inferences when *NOMATCH %* is regressed on *HAVEN %* or *LOGHAVEN*.

[30]We also considered two alternative measures of tax/political cost: Firms with assets greater than $250 million (*DSIZE250*) and probability of an IRS audit (*IRSAUDIT*). *DSIZE250* equals 1 (0 otherwise) for firms with assets greater than $250 million. *IRSAUDIT* equals 1 (0 otherwise) for firms with a high probability of IRS audit. Following prior literature, *IRSAUDIT* is the probability of an IRS audit as defined by Transactional Records Access Clearinghouse (2007a, b). Firms are classified as having a high probability of receiving an IRS audit if they have total assets greater than $250 million and operate in any of the following two-digit SIC codes: 07–09, 12–17, 34, 37, 45 and 47. In untabulated tests, we find evidence that firms that report more than $250 million in assets or firms with a high probability of an IRS audit are incrementally more likely to aggregate geographic disclosures as tax-haven intensity increases.

[31]We provide two additional cross-sectional tests (untabulated). First, when we interact *DHAVEN* with an indicator for firms with analyst following, the interaction is significantly negative (t-stat $= -2.103$). Given the role analysts play in monitoring the firm and producing information, managers have reduced incentives (or increased pressure) to avoid aggregated disclosures. Second, we consider that the potential cost of tax avoidance could be higher for profitable firms, giving them additional incentives to aggregate disclosure. The interaction of *DHAVEN* with an indicator for profit firms is positive, as expected, but is not significant (t-value $= 1.45$).

[32]http://www.bea.gov/iTable/index_MNC.cfm.

[33]The growth in the amount of reinvested earnings in tax havens is equally dramatic. Reinvested earnings

in Ireland, Luxembourg, Bermuda, and UK Islands/ Caribbean grew from 17.7% in 1998 to 32.2% in 2010. In contrast, in Canada, Germany the UK, and Mexico, reinvested earnings declined over the same period from 25.2 to 14.2%.

[34]The number of subsidiaries in Exhibit 21 has been declining in recent years for some companies (e.g., Gramlich & Whiteaker-Poe 2013). If we exclude all sample observations after 2008 or after 2004, results are very similar to those reported in the tables and no inferences are affected.

REFERENCES

Ali, A., Klasa, S., & Yeung, E. 2009. The limitations of industry concentration measures constructed with Compustat data: implications for finance research. *Review of Financial Studies, 22,* 3839–3872.

Allred, B. B., Nielson, D. L., Sharman, J. C., & Findley, M. G. 2017. Anonymous shell companies: a global audit study and field experiment in 176 countries. Forthcoming, *Journal of International Business Studies*.

Association for Accountancy and Business Affairs Limited. 2003. A proposed international accounting standard. Reporting turnover and tax by location. http://visar.csustan.edu/aaba/ProposedAccstd.pdf.

Austin, C. R., & Wilson, R. J. 2013. Are reputational costs a determinant of tax aggressiveness? Working Paper, University of Iowa and University of Oregon.

Balakrishnan, K., & Cohen, D. A. 2014. Competition and financial accounting misreporting. Working Paper, London Business School and University of Texas at Dallas.

Balakrishnan, K., Blouin, J., & Guay, W. R. 2015. Does tax aggressiveness reduce financial reporting transparency? Working Paper, London Business School and University of Pennsylvania.

Balakrishnan, R., Harris, T. S., & Sen, P. K. 1990. The predictive ability of geographic segment disclosures. *Journal of Accounting Research, 28,* 305–325.

Bayou, M. E., Reinstein, A., & Williams, P. F. 2011. To tell the truth: a discussion of issues concerning truth and ethics in accounting. *Accounting, Organizations and Society, 36*(2), 109–124.

Behn, B. K., Nichols, N. B., & Street, D. L. 2002. The predictive ability of geographic segment disclosures by US companies: SFAS No. 131 vs. SFAS No. 14. *Journal of International Accounting Research, 1,* 31–44.

Bens, D., Berger, P., & Monahan, S. 2011. Discretionary disclosure in financial reporting: an examination comparing internal firm data to externally reported area data. *The Accounting Review, 86*(2), 417–449.

Bens, D. A., & Monahan, S. J. 2004. Disclosure quality and the excess value of diversification. *Journal of Accounting Research, 42,* 691–730.

Berger, P. G., & Hann, R. 2007. Area Profitability and the proprietary and agency costs of disclosure. *The Accounting Review, 82*(4), 869–906.

Boatsman, J. R., Behn, B. K., & Patz, D. H. 1993. A test of the use of geographical segment disclosures. *Journal of Accounting Research, 31,* 46–64.

Botosan, C. A., & Harris, M. S. 2000. Motivations for a change in disclosure frequency and its consequences: an examination of voluntary quarterly segment disclosures. *Journal of Accounting Research, 38*(2), 329–353.

Botosan, C. A., & Stanford, M. A. 2005. Managers' motives to withhold segment disclosures and the effect of SFAS No. 131 on analysts' information environment. *The Accounting Review, 80*(3), 751–772.

Chen, S., Chen, X., Cheng, Q., & Shevlin, T. 2010. Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics, 95*(1), 41–61.

Cheynel, E. 2013. A theory of voluntary disclosures and cost of capital. *Review of Accounting Studies, 18*(4), 987–1020.

Christian Aid. 2009. *False profits: robbing the poor to keep the rich tax-free.* London: Christian-Aid.

Citizens for Tax Justice. 2015. Offshore shell games 2015: the use of offshore tax havens by Fortune 500 Companies. Available at: http://ctj.org/pdf/offshoreshell2015.pdf.

Clausing, K. A. 2009. Multinational firm tax avoidance and US government revenue. *National Tax Journal, 62*(4), 703–726.

Cooper, D. J., Dacin, T., & Palmer, D. 2013. Fraud in accounting, organizations and society: extending the boundaries of research. *Accounting, Organizations and Society, 38*(6–7), 440–457.

Cumming, D., Filatotchev, I., Knill, A., Reeb, D. M., & Senbet, L. 2017. Law, finance, and the international mobility of corporate governance. *Journal of International Business Studies, 48*(2), 123–147.

Darrough, M., & Stoughton, N. 1990). Financial disclosure policy in an entry game. *Journal of Accounting and Economics, 12,* 219–243.

Deloitte. 2012. SEC Comment Letter Examples Income Taxes. http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Tax/us_tax_SEC_Comment_Examples_Income_Taxes_092112.pdf.

Donohoe, M., McGill, G., & Outslay, E. 2012. Through a glass darkly: what can we learn about a US multinational corporation's international operations from its financial statement disclosures? *National Tax Journal, 65*(4), 961–984.

Dunne, K. M., & Ndubizu, G. A. 1995. International acquisition accounting method and corporate multinationalism: evidence from foreign acquisitions. *Journal of International Business Studies, 26*(2), 361–377.

Dye, R. A. 1985. Disclosure of nonproprietary information. *Journal of Accounting Research, 23*(1), 123–145.

Dye, R. A. 1986. Proprietary and nonproprietary disclosure. *Journal of Business, 4*(1), 331–366.

Dyreng, S., Hanlon, M., & Maydew, E. 2012. Where do firms manage earnings? *Review of Accounting Studies, 17*(3), 649–687.

Dyreng, S., & Lindsey, B. 2009. Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on US multinational firms' tax rates. *Journal of Accounting Research, 47*(5), 1283–1316.

Erickson, M., Hanlon, M., & Maydew, E. L. 2004. How much will firms pay for earnings that do not exist? Evidence of taxes paid on allegedly fraudulent earnings. *The Accounting Review, 79*(2), 387–408.

Financial Task Force, 2011. Country-by-country reporting. http://www.financialtaskforce.org/issues/country-by-country-reporting.

Frank, M. M., Lynch, L. J., & Rego, S. O. 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review, 84*(2), 467–496.

Garcia, L., & Oats, L. 2012. Boundary work and tax regulation: a Bourdieusian view. *Accounting, Organizations and Society, 37*(5), 304–321.

Gigler, F. 1994. Self-enforcing voluntary disclosures. *Journal of Accounting Research, 32*(2), 224–240.

Global Witness. 2005. Extracting transparency: the need for an international financial reporting standard for the extractive industries. Global Witness: London.
Government Accountability Office (GAO). 2008. Large US corporations and federal contractors with subsidiaries in jurisdictions listed as tax havens or financial privacy jurisdictions. GAO-09-157. Washington, DC, December 18.
Graham, J., Hanlon, M., Shevlin, T., & Shroff, N. 2014. Incentives for tax planning and avoidance: evidence from the field. *The Accounting Review, 89*(3), 991–1023.
Gramlich, J., & Whiteaker-Poe, J. 2013. Disappearing subsidiaries: the cases of google and oracle. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2229576.
Hanlon, M., & Heitzman, S. 2010. A review of tax research. *Journal of Accounting and Economics, 50*(2–3), 127–178.
Harris, M. S. 1998. The association between competition and managers' business segment reporting decisions. *Journal of Accounting Research, 36*(1), 111–128.
Hart, O. 1983. The market mechanism as an incentive scheme. *Bell Journal of Economics, 14,* 366–382.
Harvey, D. W., Rhode, J. G., & Merchant, K. A. 1979. Accounting aggregation: user preferences and decision making. *Accounting, Organizations and Society, 4*(3), 187–210.
Healy, P. M., & Palepu, K. G. 2001. Information asymmetry, corporate disclosure and the capital markets: a review of the empirical disclosure literature. *Journal of Accounting and Economics, 31,* 405–440.
Herrmann, D. 1996. The predictive ability of geographic segment information at the country, continent and consolidated levels. *Journal of International Financial Management and Accounting, 7,* 50–73.
Herrmann, D., & Thomas, W. B. 2000. A model of forecast precision using segment disclosures: implications for SFAS No.131. *Journal of International Accounting, Auditing and Taxation, 9*(1), 1–18.
Higgins, D., Omer, T., & Phillips, J. 2015. The influence of a firm's business strategy on its tax aggressiveness. *Contemporary Accounting Research, 32*(2), 674–702.
Hoberg, G., & Phillips, G. 2010. Product market synergies and competition in mergers and acquisitions: a text-based analysis. *Review of Financial Studies, 23*(10), 3773–3811.
Hoberg, G., & Phillips, G. 2016. Text-based network industries and endogenous product differentiation. *Journal of Political Economy, 124*(5), 1423–1465.
Hoi, C. K., Wu, Q., & Zhang, H. 2013. Is corporate social responsibility (CSR) associated with tax avoidance? Evidence from irresponsible CSR activities. *The Accounting Review, 88*(6), 2025–2059.
Hope, O.-K., Kang, T., Thomas, W. B., & Vasvari, F. 2009. The effects of SFAS 131 geographic segment disclosures by US multinational companies on the valuation of foreign earnings. *Journal of International Business Studies, 40*(3), 421–443.
Hope, O.-K., Ma, M., & Thomas, W. B. 2013. Tax avoidance and geographic earnings disclosures. *Journal of Accounting and Economics, 56,* 170–189.
Hope, O.-K., & Thomas, W. B. 2008. Managerial empire building and firm disclosure. *Journal of Accounting Research, 46*(3), 591–626.
Huseynov, F., & Klamm, B. K. 2012. Tax avoidance, tax management and corporate social responsibility. *Journal of Corporate Finance, 18*(4), 804–827.
Klassen, K. J., & Laplante, S. K. 2012a. The effect of foreign reinvestment and financial reporting incentives on cross-jurisdictional income shifting. *Contemporary Accounting Research, 29,* 928–955.
Klassen, K. J., & Laplante, S. K. 2012b. Are US multinational corporations becoming more aggressive income shifters? *Journal of Accounting Research, 50,* 1245–1285.
Lail, B., Thomas, W. B., & Winterbotham, G. 2014. Classification shifting using the 'corporate/other' segment. *Accounting Horizons* (September), *48*(3), 455–477.
Lambert, R., Leuz, C., & Verrecchia, R. 2007. Accounting information, disclosure, and the cost of equity. *Journal of Accounting Research, 45,* 385–420.
Lennox, C., Lisowsky, P., & Pittman, J. 2013. Tax aggressiveness and accounting fraud. *Journal of Accounting Research, 22*(1), 435–480.
Lev, B. 1968. The aggregation problem in financial statements: an informational approach. *Journal of Accounting Research, 6*(2), 247–261.
Liu, Y. A., & Hsueh, L. P. 1993. The effect on the debt denomination decision of multinational projects. *Journal of International Business Studies, 24*(1), 145–154.
Nichols, D., Tunnell, L., & Seipel, C. 1995. Earnings forecast accuracy and geographic segment disclosures. *Journal of International Accounting, Auditing and Taxation, 4,* 113–126.
Nobes, C. W. 1996. The effects of international differences in the tax treatment of goodwill: a comment. *Journal of International Business Studies, 27*(3), 589–592.
Papke, L. E., & Wooldridge, J. M. 1996. Econometric methods for fractional response variables with an application to 401 (k) plan participation rates. *Journal of Applied Econometrics, 11*(6), 619–632.
Peltzman, S. 1976. Toward a more general theory of regulation. *The Journal of Law and Economics, 19,* 211–240.
Publish What You Pay. 2010. Campaign for a country by country reporting standard. http://www.publishwhatyoupay.org/country-by-country-reporting.
Price Waterhouse Coopers (PWC). 2012. Tax transparency and country-by-country reporting: an overview and comparison of the transparency initiatives. www.pwc.com/gx/en/tax/…/tax-transparency-reporting.jhtml.
Shackelford, D., & Shevlin, T. 2001. Empirical tax research in accounting. *Journal of Accounting and Economics, 31*(1–3), 321–387.
Shah, A. 1995. Creative compliance in financial reporting. *Accounting, Organizations and Society, 21,* 23–39.
Stigler, G. 1971. The theory of economic regulation. *Bell Journal of Economics and Management Science, 2*(1), 3–21.
Sugathan, A., & George, R. 2015. The influence of governance infrastructure and corporate governance on profit shifting. *Journal of International Business Studies, 46*(8), 886–916.
Tax Justice Network. 2003. Why is country-by-country financial reporting by multinational companies so important? www.taxjustice.net.
Thomas, W. 2000. The value-relevance of geographic segment earnings disclosures under SFAS 14. *Journal of International Financial Management and Accounting, 11,* 133–155.
Transactional Records Access Clearinghouse. 2007a. IRS face-to-face audits of federal income tax returns filed by corporations. http://trac.syr.edu/tracirs/trends/v10/corporations.html.
Transactional Records Access Clearinghouse. 2007b. Audit rates for large corporations with assets of $250 million or more. http://trac.syr.edu/tracirs/trends/v10/audindustry.html.
United States Senate (Permanent Subcommittee on Investigations). 2006. Tax haven abuses: the enablers, the tools, and secrecy. http://www.gpo.gov/fdsys/pkg/CHRG-109shrg29760/html/CHRG-109shrg29760.htm.
Verrecchia, R. E. 1999. Disclosure and the cost of capital: a discussion. *Journal of Accounting and Economics, 26,* 271–283.
Watts, R., & Zimmerman, J. 1986. *Positive accounting theory.* Englewood Cliffs, NJ: Prentice Hall.
Zimmerman, J. 1983. Taxes and firm size. *Journal of Accounting and Economics, 5*(1), 119–149.

APPENDIX 1: SAMPLE SELECTION

	Observations		
	Firm-year-countries	Firm-years	Firms
Exhibit 21 data from 1998 to 2010[a]	272,167	30,110	5,470
Missing control variables	(9,923)	(608)	(109)
Missing geographic segment data[b]	(59,293)	(8,521)	(846)
Segment sales not >0[c]	(65,534)	(8,935)	(1,817)
Final Sample	137,417	12,046	2,698

[a] The sample begins in 1998 because a new reporting standard (ASC 280 or previously SFAS 131) took effect that year and ends in 2010 because this is the last year Exhibit 21 data are available from Scott Dyreng's website (https://sites.google.com/site/scottdyreng/Home/data-and-code).
[b] Firms did not have geographic titles reporting in the Segment file in Compustat.
[c] Firms had at least one geographic segment with sales less than or equal to zero.

APPENDIX 2: VARIABLE DEFINITIONS

Dependent variable (measure of aggregation)	
NOMATCH %	= Portion of countries in Exhibit 21 *not* disclosed at the country level in geographic disclosures
Test variables (measures of tax-haven intensity)	
DHAVEN	= 1 (0 otherwise) if a country is one of the tax-haven locations as described in Dyreng and Lindsey (2009): Andorra, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belize, Bermuda, British Virgin Islands, Brunei, Cape Verde, Cayman Islands, Cook Islands, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey and Alderney, Hong Kong, Ireland, Isle of Man, Jersey, Kitts and Nevis, Latvia, Lebanon, Liberia, Liechtenstein, Luxembourg, Macau, Maldives, Malta, Marshall Islands, Mauritius, Monaco, Montserrat, Motswana, Nauru, Netherlands Antilles (or Dutch Antilles), Niue, Palau, Panama, Samoa, San Marino, Seychelles, Singapore, St. Lucia, St. Vincent and The Grenadines, Switzerland, US Virgin Islands, Uruguay, and Vanuatu
HAVEN %	= Percentage of countries in Exhibit 21 classified as tax havens
LOGHAVEN	= Natural log (one plus) the number of tax-haven countries listed in Exhibit 21
Control variables	
BIG4	= 1 (0 otherwise) if the company is audited by a top four accounting firm or its predecessors
SIZE	= Natural log of total assets (AT)
MTB	= Ratio of market value (PRCC_F × CSHO) to book value (CEQ)
NOL	= 1 (0 otherwise) if tax loss carry forward (TLCF) is negative at the beginning of the year
CNOL	= 1 (0 otherwise) if tax loss carry forward (TLCF) is more negative at the end of year t than the beginning of year *t*
FORINC	= Foreign pre-tax income (PIFO) divided by lagged total assets (AT)
ROA	= Net income (NI) divided by lagged total assets (AT)
LEV	= Long-term debt (LT) divided by total assets (AT)
ADV	= Advertising expense (XAD) divided by lagged total revenue (REVT)
RD	= Research and development expense (XRD) divided by lagged total assets (AT)
INTANG	= Intangible assets (INTAN) divided by lagged total assets (AT)
PPE	= Property, Plant and Equipment (PPENT) divided by lagged total assets (AT)
EQINC	= Equity income in subsidiaries (EINC) divided by lagged total assets (AT)
SUBMAT	= Number of foreign subsidiaries divided by number of countries listed in Exhibit 21
FSR	= Foreign sales (computed from Compustat Segment database) divided by total revenue (REVT)

Alternative dependent variables (measures of aggregation)	
LEVEL	= Average aggregation score of countries in Exhibit 21. Each country receives an aggregation score based on its related geographic disclosure. Geographic disclosures are scored as follows 0.0 = Countries (e.g., Ireland) 0.5 = Aggregate countries (e.g., Germany/Ireland)[a] 1.0 = Subcontinents or aggregate countries/other (e.g., Western Europe or Germany/Ireland/Other) 1.5 = Continents or aggregate subcontinents (e.g., Europe or Western Europe/Southeast Asia) 2.0 = Aggregate continents (e.g., Europe/Asia) 2.5 = Aggregate continents/other (e.g., Europe/Asia/Other) 3.0 = Major geographic regions (e.g., Eastern Hemisphere) 4.0 = All foreign (e.g., Foreign, International, Abroad, etc.)[b]
LEVEL_SALESWT	= Average aggregation score of countries in Exhibit 21 weighted by sales in each disclosed geographic area
NOMATCH%_NOTES	= Portion of geographic segments not disclosed at the country level
LEVEL_NOTES	= Average aggregation score of disclosed geographic segments
LEVEL_SALESWT_NOTES	= Sales-weighted average aggregation score of disclosed geographic segments
NGEO_NOTES(−1)	= Number of disclosed geographic segments multiplied by −1

[a] The notation "Germany/Ireland" indicates that the firm discloses operations of Germany and Ireland as a single segment without any disclosure of the separate operations in each country.
[b] Aggregation scores increase by increments of 0.5, except for disclosure of all foreign operations in a single segment. Such aggregation essentially offers very limited (if any) information useful in understanding specific geographic operations and the use of structured transactions in foreign countries to avoid taxes. Thus we increase the aggregation score by 1.0 beyond disclosure of major geographic regions (from 3.0 to 4.0).

ABOUT THE AUTHORS

Herita Akamah is an Assistant professor at the University of Nebraska–Lincoln. Her research focuses on whether and how corporate stakeholders and institutional norms affect financial reporting. Herita Akamah earned her PhD in accounting from the University of Oklahoma, worked for six years as an accountant and audit consultant, and serves as a board member for the Lincoln Literacy Center.

Ole-Kristian Hope (PhD Kellogg; CFA, CPA, CMA) is the Deloitte Professor and PhD coordinator at the Rotman School of Management, University of Toronto. He is interested in financial disclosure, financial reporting quality, corporate governance, analysts, auditing, private firms, corporate finance, and international business issues. He has published in many top journals and regularly presents in seminars and conferences around the world.

Wayne B Thomas (CPA) is the John T. Steed Chair and Professor of Accounting at the John T. Steed School of Accounting at the University of Oklahoma. He earned his PhD at Oklahoma State University. His research interests include accounting information in international capital markets, techniques used by managers to manipulate earnings, the importance of financial disclosures, and financial statement analysis.

Accepted by Gary Biddle, Area Editor, 24 April 2017. This article has been with the authors for four revisions.