Tax Haven Incorporation and the Cost of Capital*

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Abstract

Incorporating the firm's corporate parent in a tax haven is a major decision that receives significant attention from many stakeholders, yet certain implications of this corporate strategy remain unclear. While tax haven incorporation offers tax savings, it also imposes risks that are potentially costly and hence important to consider. We predict and find a higher cost of equity capital in firms with parent companies that are incorporated in tax havens but that are primarily based in nonhaven countries. We also predict and find that the observed cost of equity premium is more pronounced in firms with greater tax risk, firm-level information risk, and country-level legal risk. We also employ corporate inversions in a difference-in-differences test and again find a positive relation between tax haven parent incorporation and the cost of capital. Our findings imply that an increased cost of capital is a material cost of tax haven parent incorporation. We contribute to the literatures on valuation of tax haven use, tax and nontax costs of corporate tax strategies, corporate inversions, and the relation between taxes and the cost of capital. Our study provides evidence on the tax and nontax risks of a uniquely observable tax strategy (i.e., tax haven parent incorporation) that could factor into firms' decisions about whether to incorporate in a tax haven and policymakers' efforts to deter such activity.

Keywords: tax avoidance, tax havens, corporate inversions, cost of equity

JEL Classifications: G32; H26; M41.

1. Introduction

We examine how strategically incorporating a firm's parent entity in a tax haven country (i.e., "tax haven incorporation") relates to its cost of capital. We focus on "tax haven" firms that we define as any multinational corporation (MNC) whose parent company is incorporated in a tax haven but is headquartered or primarily operates in a different country (i.e., the "base" country).[1] We specifically examine whether these tax haven firms face a higher cost of capital compared to MNCs not incorporated in a tax haven (i.e., "nonhaven" MNCs).[2] Tax haven incorporation is a highly advantageous tax strategy that can create "stateless income" that is taxed away from the base country at a low or zero rate (Seida and Wempe 2004; Kleinbard 2011). Yet this strategy could engender nontax costs, especially those related to increases in tax risk, information risk, and legal risk, which may all contribute to a higher cost of capital. We provide the first evidence regarding whether an increased cost of capital is a material cost of tax haven incorporation.

Understanding the costs of tax haven incorporation is vital given its occurrence despite objections from politicians, regulators, and the media (Allen and Morse 2013; Durnev et al. 2016; Atwood and Lewellen 2019). Our study helps meet the demand for measurement of costs associated with tax haven incorporation (Hanlon and Heitzman 2010), helping explain why more firms do not incorporate in tax havens and informing regulators on the forces that may affect the tax haven incorporation decision and its subsequent outcomes. Our setting employs firms that have

[1] Desai (2009) defines the "decentering of the global firm" as the separation of the firm's incorporation country, listing country, or country of headquarters from its country of origin. We focus on tax haven firms that have separated their incorporation country (i.e., legal domicile) from the headquarters or country of origin (i.e., the base country). We follow Atwood and Lewellen (2019)'s definition of a "base" country. Our sample selection section provides more details on how the base country is determined.

[2] The comparison group for a tax haven firm is all firms that are based in the same country as the tax haven firm that have not decentered to a tax haven. For example, the comparison group for a Chinese-based tax haven firm that is incorporated in Bermuda would be all other Chinese-based multinational firms that are not incorporated in tax havens. Our sample of tax haven firms includes both firms that moved their country of incorporation to a tax haven through an inversion transaction as well as those that initially incorporated in a tax haven.

the most direct exposure to a tax haven (i.e., through their tax haven parent), for whom the tax and nontax risks of tax havens are likely to be most salient.

Although tax haven incorporation is easily identifiable,[3] its relations to corporate decisions and outcomes are more difficult to observe. We expect tax haven incorporation to shift both tax and nontax risk upward compared to nonhaven firms. The low and zero tax rates available in tax havens create incentives to aggressively funnel taxable income through them (Seida and Wempe 2004), raising the risk of back taxes, penalties, and interest (Grubert and Slemrod 1998). Further, ever-changing base country tax laws and enforcement often target tax haven firms, raising tax risk (Webber 2011).

Tax haven incorporation could also increase two forms of nontax risk: informational and legal risk. Tax haven countries promote extensive financial secrecy and they have unique corporate laws attributable to firms legally domiciled there, which can prevent shareholders from investigating and disciplining managerial misconduct (Kun 2004; Leikvang 2012; Gravelle 2014; Moon 2018). These unique tax haven regulations may provide opportunities for managerial misconduct and obfuscation of information from financial statement users and tax authorities (Leikvang 2012; Lewellen 2019).[4] Thus, tax haven incorporation can increase information risk by shifting the firm's information environment (Akamah et al. 2017; Lewellen 2019) despite mandatory disclosure rules of the base country or listing country.[5] Moreover, tax haven incorporation shifts the firm's legal regime to the tax haven, potentially reducing the abilities of regulators and stakeholders to monitor and discipline management, raising legal risk.

[3] For example, the place of incorporation is listed on page 1 of a US-listed firm's Form 10-K.
[4] Examples of studies suggesting that tax havens facilitate managerial misconduct include Desai (2005), Morgenthau (2012), Black et al. (2014), Durnev et al. (2016), and Atwood and Lewellen (2019).
[5] For instance, the US Senate Permanent Subcommittee on Investigations (2006, 1) links tax havens to "tax evasion, financial fraud, and money laundering" and suggests that secrecy laws in tax havens hinder financial transparency.

The cost of capital is a function of a firm's expected level of future cash flows, as well as of the covariance of these cash flows with those of other firms (Lambert et al. 2007).[6] We expect the increased tax, informational, and legal risks that accompany tax haven incorporation to impair investors' abilities to estimate the distribution of future cash flows, increasing the *variance* of the firm's future cash flows as well as the assessed *covariance* of the firm's cash flows with market cash flows (i.e., beta), which is not diversifiable (Lambert et al. 2007). Thus, we predict that tax haven incorporation is positively associated with the cost of capital.

We test our prediction using a sample of 41,480 MNC firm-years from 22 base countries between 1990 and 2013. Using OLS regressions of the cost of capital implied in analysts' forecasts (Easton 2004) on a binary tax haven incorporation variable, we find that, on average, incorporating the parent in a tax haven is associated with a 2.19 percentage point higher cost of equity compared to nonhaven MNCs with the same base country.[7] This premium equates to 16.59% of the mean cost of equity capital, suggesting that material risks accompany tax haven incorporation. Our results hold after controlling for the level of tax avoidance and a host of other observable firm-level characteristics, as well as fixed effects for the base country, industry, and year.

We next examine the variation in our results across several important geographic regions. Large proportions of the tax haven firms in our sample are based in China (62%) and the United States (17%). We find that the cost of equity premium associated with tax haven incorporation is 72 basis points (bps, i.e., 0.72 percentage points) for US-based firms, 195 bps for non-Chinese firms based outside the United States, and 257 bps for China-based firms. While the cost of capital

[6] Assuming expected cash flows are positive. This assumption is reasonable given that tax haven incorporation reflects the pursuit of cash tax savings that would occur when cash flow is positive.

[7] Most directly, our base country fixed effects regression design compares tax haven firms to nonhaven MNCs based in the same country. The magnitude of the cost of equity premium we document for tax haven firms is in line with findings in other international settings (e.g., Francis et al. 2005; Hail and Leuz 2006). For example, Hail and Leuz (2006) find that going from zero to one in country-level disclosure requirements and securities regulation indices are associated with decreases in the cost of equity capital of 2.7 and 2.3 percentage points, respectively.

premium associated with tax haven incorporation varies considerably across each of these geographic regions, it is economically meaningful in all these regions.[8]

We investigate the tax, information, and legal risks that we expect to explain the tax haven cost of capital premium. Our cross-sectional results suggest that tax risk, informational risk, and base country legal risk each explain a significant portion of the positive relation between tax haven incorporation and the cost of equity capital. Collectively, these risks account for the vast majority of the cost of capital premium we observe in tax haven firms.

We continue by estimating a difference-in-differences design using a subsample of corporate inverters (i.e., firms that reincorporated into tax havens). We find that inversion firms faced no difference in the cost of equity relative to peers in their pre-inversion period but bear a 2.22 percentage point (16.82 relative percent) higher cost of equity premium following inversion. Further, using entropy balancing as an alternative research design, we find that both inversion firms and noninverting tax haven firms face a higher cost of capital than nonhaven MNCs.

One potential concern with our sample is that 62% of our tax haven observations are based in China. Empirically, we address this concern by presenting our primary results both with and without China. However, one theoretical concern may be that the reasons for tax haven incorporation differ for Chinese firms. For example, China's tax system initially favored foreign incorporation (Li 2007). Changes enacted in 2008 reduced this favoritism, yet still, the tax law allows certain advantages for foreign-incorporated firms (Ng 2013; An and Tan 2014).[9] However,

[8] While the magnitude of the cost of equity premium associated with tax haven incorporation for US -based firms (i.e., 72 bps) is smaller in comparison to geographic subsamples outside the United States, the effect is still economically meaningful and is in line with other US cost of capital studies. For example, other studies focusing on US firms report reasonably similar economic magnitudes of cost of equity premiums associated with tax avoidance (19 to 26 bps, Goh et al. 2016), disclosure (28 bps, Botosan 1997), and IRS monitoring (58 bps, El Ghoul et al. 2011).

[9] Specifically, the pre-2008 law contained tax holidays and preferences for foreign investors. The post-2008 law eliminated these features but uses a worldwide system that exempts foreign earnings of foreign-incorporated MNCs while making no such exemption for China-incorporated MNCs.

corporate tax avoidance is a major underlying factor for all firms in choosing to incorporate in a tax haven, regardless of the base country. In sum, we believe that both theoretically and empirically our results generalize outside of China.

Our results are robust to several alternative specifications. Importantly, we find tax haven firms' cost of capital is significantly higher than that of firms that have decentered to nonhaven countries. We find consistent results using the cost of debt and various other measures of the cost of equity as alternate cost of capital proxies. Our results are not sensitive to the exclusion of any individual base country. Finally, we find the higher cost of capital associated with tax haven parent incorporation is distinct from and stronger than that of tax haven subsidiary usage.

Our findings are important as the US Treasury, OECD, and G20 all seek to reduce aggressive tax avoidance that occurs through tax havens (e.g., Hines and Rice 1994; Johannesen and Zucman 2014). We provide evidence of a material economic consequence occurring in haven-parented decentered firms. While measuring the overall net cost or benefit of tax haven incorporation is beyond the scope of our study, the cost of capital premium would reduce the net benefits of this corporate strategy; therefore, one could view it as a market-driven deterrent to tax haven incorporation.

Our study contributes to the literature on the valuation effects of tax haven use. Durnev et al. (2016) find that, despite the tax savings, firms with tax haven parents have lower firm value compared to nonhaven MNCs. Since firm value is impacted by both the cost of capital and expected future cash flows, our study builds upon Durnev et al. (2016) by helping explain the lower firm value in tax haven firms. Meanwhile, findings on the valuation effects of tax haven *subsidiary* use are mixed (e.g., Inger 2013; Durnev et al. 2016; Bennedsen and Zeume 2018). Tax haven parent incorporation is distinct from tax haven subsidiary usage in that the former changes

the firm's legal structure, potentially increasing informational and legal risks (Durnev et al. 2016; Atwood and Lewellen 2019). Thus, firms with tax haven parents have the most direct exposure to the tax haven, allowing stronger identification of the risks of tax haven use.

We also contribute to the literature on the costs of tax haven parents and corporate inversions, which is of intense interest to regulators, politicians, academics, and the media. We respond directly to calls for research on the costs of tax haven incorporation (e.g., Hanlon and Heitzman 2010). Tax haven incorporation is an obvious way to reduce taxes, but our study identifies important tax and nontax risks that could factor into a firm's decision about whether to incorporate in a tax haven. We thereby contribute to the tax planning literature, specifically the "all taxes, all parties, all costs" framework of Scholes et al. (2014).

Finally, we advance the literature on the association between the cost of capital and tax avoidance by providing evidence on the tax and nontax risks of a uniquely observable tax strategy (i.e., tax haven incorporation). Two related studies also examine the cost of capital effects of tax avoidance. Goh et al. (2016) find that the cost of capital is negatively associated with the level of tax avoidance because it increases the *level* of future cash flows. Cook et al. (2017) find that unexpected levels of tax avoidance, as evidenced by deviations from the firm's peers or the firm's past tax avoidance, are associated with a higher cost of capital. Our study is related but distinct. While these studies focus on the observed *level* of the tax burden, we focus on the tax and nontax risks of tax avoidance, which may occur irrespective of the observed level of the tax burden.

2. Background and hypothesis development

Following prior studies, we identify tax havens as countries with low or zero tax rates and the presence of secrecy (OECD 1998; Tax Justice Network 2007; Gravelle 2014). Tax savings seems to be a primary driver of tax haven incorporation (Cloyd et al. 2003; Seida and Wempe

2004; Markle and Shackelford 2012). For firms based in countries with worldwide tax systems, tax haven incorporation may reduce tax burdens by effectively transitioning the firm to a territorial tax system where firms pay tax only to countries where income is earned or allocated.[10] Moreover, for firms based in any country, having a tax haven parent can unlock greater tax savings through shifting income out of the base country (Arnold 2011).[11] While the level of tax savings from tax haven incorporation varies between base countries, the important constant is that the opportunity for tax savings exists. Nontax considerations may also be important. For example, access to foreign capital may be a secondary benefit of tax haven parent incorporation (e.g., Desai 2009; Sharman 2012).[12]

Related literature on the valuation effects of tax haven use finds that decentered firms with tax haven parents have lower firm value compared to other firms (Durnev et al. 2016) and finds negative market reactions to announcements of inversions to tax havens (Cloyd et al. 2003), suggesting that shareholders perceive some nontax risks associated with this corporate strategy. Literature examining the valuation effects of tax haven subsidiary use offers mixed conclusions on whether tax haven subsidiaries are associated with higher, lower, or no different firm value compared to other firms (e.g., Inger 2013; Durnev et al. 2016; Bennedsen and Zeume 2018). Overall, these studies suggest that tax and/or nontax risks of tax haven use may exist. However, none of these studies explore both the tax and nontax risks of tax haven use in conjunction with

[10] With a worldwide tax system, the firm pays tax in the countries where income is earned and then pays a residual tax to the tax residence country if that country's tax rate is higher. The majority of our sample countries have worldwide tax systems for at least part of the sample period.

[11] Specifically, shifting stateless income through a tax haven subsidiary offers tax savings that are limited by controlled foreign corporation (CFC) rules, which may automatically reclassify stateless income back to the base country. Tax haven parent incorporation distances a firm from the grasp of CFC rules, unlocking larger tax savings.

[12] Incorporating in a tax haven may help attract capital for two reasons. First, locating the firm's legal home in a tax haven may result in shareholder-level tax savings by reducing withholding taxes (Desai 2009). Second, for firms based in countries with weak legal institutions, incorporating outside of the base country and in a tax haven may reduce the likelihood of government expropriation of the firm's assets and therefore result in a more desirable investment to foreign shareholders (Desai 2009; Sharman 2012).

the tax savings. Our study extends this literature by examining the long-run (on average) market pricing of tax haven incorporation across many base countries as well as cross-sectional variation in the cost of capital as various tax and nontax risks increase.

To establish a link between tax haven incorporation and the cost of equity capital, we rely on the model developed by Lambert et al. (2007). In this model, a firm's cost of equity capital is a function of market factors and two firm-specific factors: (1) the firm's expected future cash flows and (2) the assessed covariance of the firm's cash flows with other firms' cash flows. Lambert et al. (2007) demonstrate that the cost of capital is negatively related to the *level* of the firm's expected future cash flows and is positively related to the *covariance* of the firm's cash flows with aggregate market cash flows. Importantly, they note that the covariance effect is not diversifiable.

Tax haven incorporation is likely to affect both the *level* of future cash flows and the *covariance* parameter. Tax savings should increase future after-tax cash flows, and Goh et al. (2016) document that the higher levels of cash flows that accompany tax avoidance result in a *lower* cost of equity capital. Meanwhile, if the risks of tax haven incorporation impair shareholders' abilities to estimate future cash flows, the *covariance* parameter should increase, resulting in a *higher* cost of equity capital. In addition, Cook et al. (2017) find that deviations from expected levels of tax avoidance are associated with a higher cost of equity capital, because underinvestment in tax avoidance leads to lower future cash flow levels and overinvestment in tax avoidance may cause uncertainty regarding future cash flows if the tax positions taken are not sustained. Firms can arrive at similar outcomes with differing levels of underlying tax risk (Neuman et al. 2020); thus, conceptually, tax risk differs from tax avoidance. Empirically, we control for both the level of tax avoidance and unexpected tax avoidance levels to orthogonalize the effect of the risks of tax haven incorporation from the effects of the tax savings and extreme

levels of tax avoidance on the cost of capital. We propose that tax haven incorporation should be associated with the cost of capital due to higher tax risk, informational risk, and legal risk.

We define tax risk as the uncertainty of tax outcomes (Guenther et al. 2017). We expect tax haven incorporation to shift tax risk upward at the time of incorporation or when the firm begins to shift income more aggressively (Webber 2011). Specifically, tax haven incorporation itself could signal aggressive earnings stripping (i.e., shifting income from the base country to low tax countries), prompting tax authorities to investigate tax haven firms more aggressively, which may produce future tax-related payments for settlements, interest, and penalties. Since firms attempt to obfuscate their tax positions to avoid tax authorities' scrutiny, capital market participants may face difficulty accurately estimating a firm's tax risk (Bonsall et al. 2017). However, investors can infer earnings stripping from low effective tax rates (ETRs) and ETR reconciliations found in the footnotes to the firm's financial statements, which highlight permanent tax reductions such as lower tax rates applicable to foreign income. Tax risk increases the assessed covariance of a firm's cash flows with those of other firms, because market participants have difficulty estimating the future tax cash flows resulting from aggressive tax strategies. Thus, to the extent tax haven incorporation shifts tax risk upward, it should be positively associated with the cost of equity capital.

Aside from tax risk, tax haven incorporation could also affect firms' cost of capital for nontax reasons. Tax havens are infamous for legally mandated secrecy and they do not generally share information except when a criminal act violates the laws of the tax haven (Leikvang 2012; Gravelle 2014), which may increase informational risk.[13] When a firm's parent entity is

[13] The SEC enforcement manual (SEC 2017, 78) suggests that when there is a foreign connection to an investigation, staff members frequently rely on information sharing arrangements with foreign jurisdictions. When firms have operations in foreign jurisdictions that have laws restricting the staff's ability to obtain evidence, staff generally must rely on voluntary cooperation from the company in an investigation.

incorporated in a tax haven, the entire corporate group is subject to the legal regime of the haven (Atwood and Lewellen 2019).[14] Tax havens have ring-fencing regimes where offshore firms are subject to a different and more lax set of laws compared to domestic firms (OECD 1998; Leikvang 2012). Moreover, many tax havens severely limit shareholders' ability to bring derivative actions (Kun 2004; Moon 2018) and do not obligate managers to disclose corporate records, such as board minutes, to shareholders upon request (e.g., Town and Betts 2015). These factors can reduce shareholders' ability to discipline managers and directors, increasing legal risk. In sum, for offshore firms, the unique tax haven environment can provide opportunities for earnings opacity or make firm-specific information more difficult to analyze, which impairs investors' assessments of the distribution of future cash flows and increases the covariance parameter.

In sum, we propose that tax haven incorporation increases both tax and nontax risks, controlling for the level of tax avoidance. This leads to our first hypothesis:

HYPOTHESIS 1. *Tax haven incorporation is positively associated with the cost of equity capital.*

While our first hypothesis evaluates the on-average association between tax haven incorporation and the cost of equity capital, we also examine how this association shifts as the underlying tax, informational, and legal risks become stronger. Tax haven incorporation provides additional opportunities for aggressive income shifting, which shifts tax risk upward compared to firms not engaging in aggressive income shifting (Dyreng et al. 2019). With higher tax risk, the future cash flow benefits of tax avoidance to shareholders become more uncertain. Thus, we expect that the risk premium for tax haven firms is higher for firms that engage in more aggressive tax strategies. This leads to our second hypothesis:

[14] In contrast, when a firm incorporates a subsidiary in a tax haven, the secrecy and the legal regime of the tax haven would only apply to the activities of that specific subsidiary rather than the entire firm.

HYPOTHESIS 2. *The positive association between tax haven incorporation and the cost of equity capital is stronger for firms with higher tax risk.*

Because tax haven parent incorporation potentially removes some of the firm's income from taxable jurisdictions where respective tax authorities would pursue tax revenue and instead sources it to the tax haven country of incorporation, which may weaken the grasp of the CFC rules, it is possible that tax haven incorporation instead *reduces* tax risk and therefore the cost of capital. This possibility adds tension to Hypothesis 2.

Next, we investigate how variation in information risk impacts the tax haven–cost of capital association. Research suggests that obfuscation of external financial reporting information facilitates tax planning (e.g., Balakrishnan et al. 2019). The parent company's incorporation in the tax haven is typically easily observable; thus, information risk does not come from uncertainty about where the firm is incorporated. Instead, tax haven incorporation increases information risk by making it more difficult to observe and monitor the firm's activities. We propose that greater information risk should intensify a cost of equity premium associated with tax haven incorporation. In the context of Lambert et al. (2007), information opacity hinders market participants from interpreting how the firm's current financial information maps into future cash flows, which affects the cost of capital by increasing the assessed covariance of the firm's expected future cash flows with that of the market. In addition, to the extent that greater information risk increases uncertainty about future cash flows by providing greater opportunities for manager diversion, information risk can also have an indirect effect on the cost of capital through its effect on the levels of future cash flows. In sum, greater information risk may inhibit investors from understanding how the tax haven parent strategy affects future cash flows. This leads to our third hypothesis:

HYPOTHESIS 3. *The positive association between tax haven incorporation and the cost of equity capital is stronger for firms with greater informational risk.*

Finally, we consider how variation in legal risk due to the base country-level legal environment impacts the tax haven–cost of capital association. As described above, tax haven incorporation may increase legal risk, because the tax haven environment may make it more difficult for investors to discipline managers and directors.[15] Despite being incorporated in a tax haven, tax haven firms have strong ties to the base country through management and primary operations. Thus, managers and directors may face discipline in the base country from investors and regulators (Atwood and Lewellen 2019).[16] While shareholders of tax haven firms may face difficulty bringing civil suits against managers and directors due to the unique laws of tax havens, a strong legal environment in the base country should protect shareholders in instances of managerial fraud and insider trading. Thus, a weak legal environment in a firm's base country may make risks associated with tax haven incorporation most problematic, leading to our fourth hypothesis:

HYPOTHESIS 4. *The positive association between tax haven incorporation and the cost of equity capital is stronger for firms based in countries with weaker legal environments.*

3. Research design and sample selection

Research design

Our first hypothesis predicts that tax haven incorporation is associated with a higher cost of equity capital. We use the following model to test Hypothesis 1:

[15] Acknowledging this risk, Liberian-incorporated Royal Caribbean Cruises Ltd. states in its 2015 Form 10-K, "Our public shareholders may have more difficulty in protecting their interests with respect to actions by management, directors or controlling shareholders than would shareholders of a corporation incorporated in a United States jurisdiction" (Royal Caribbean 2015, 31).

[16] While the listing country may also have important impacts on firm-level transparency and the cost of capital, Siegel (2005) and Chen et al. (2016) indicate that the strength of governance in the base country is more important than that of the listing country. Specifically, these studies find that US-listed firms based in countries with weak legal protection have low financial reporting quality. Thus, we focus on legal protection in the base country. Approximately five% of our sample firms (n = 2,097) are listed and based in different countries. Inferences are unchanged if we measure legal protection in the listing country rather than the base country.

$$COE_{it} = \beta_0 + \beta_1 HAVEN_{it} + \beta_2 TAXAVOID_{it} + \beta_3 TXDIFF_{it} + \beta_4 SIZE_{it} + \beta_5 EBITDA_{it} + \beta_6 \sigma EBITDA_{it} + \beta_7 LEV_{it} + \beta_8 BTM_{it} + \beta_9 AFOL_{it} + \beta_{10} RET_{it} + \beta_{11} \sigma RET_{it} + \beta_{12} BIAS_{it} + \Sigma \beta_k Base\ Country + \Sigma \beta_h Industry + \Sigma \beta_j Year + \varepsilon_{it} \quad (1)$$

We present detailed variable definitions in the Appendix. We measure the ex ante cost of equity capital (*COE*) implied in contemporaneous stock returns and analyst forecasts using the methodology from Easton (2004). Our independent variable of interest is *HAVEN*, which is an indicator variable equal to one if the firm is classified as a "tax haven firm" in year *t*, and zero otherwise. If there is a higher cost of capital in tax haven firms, the coefficient on *HAVEN* will be positive.

We include control variables based on factors found in prior literature to impact a firm's cost of capital (e.g., Francis et al. 2005; Hail and Leuz 2006; Lang et al. 2012; Barth et al. 2013; Goh et al. 2016). To differentiate the risks of tax haven incorporation from tax-related cash flow levels (i.e., tax avoidance effects), we control for tax avoidance (*TAXAVOID*) using the level of tax avoidance relative to the statutory tax rate (from Atwood and Lewellen 2019). We predict a negative coefficient on *TAXAVOID*, consistent with Goh et al. (2016). To ensure that *HAVEN* is not simply capturing unexpected levels of tax avoidance, we include a measure of unexpected tax avoidance (*TXDIFF*), following Cook et al. (2017), and predict a negative coefficient on *TXDIFF*.

We include firm size (*SIZE*) and expect the coefficient to be negative, consistent with prior research (e.g., Archer and Faerber 1966). We also include proxies for firm risk and profitability (Modigliani and Miller 1958), including book-to-market ratio (*BTM*), leverage (*LEV*), earnings volatility (*σEBITDA*), and profitability (*EBITDA*). We expect the coefficients on *LEV*, *σEBITDA*, and *BTM* (*EBITDA*) to be positive (negative) as these variables are increasing (decreasing) in risk. We include analyst following (*AFOL*) and expect its coefficient to be negative as suggested by prior research (e.g., Bowen et al. 2008). We include two additional proxies for equity risk,

including annual stock returns (*RET*) and stock return volatility (*σRET*).[17] We expect a negative (positive) coefficient on *RET* (*σRET*). We also include forecast bias (*BIAS*) to control for bias in analysts' forecasts, which may cause bias in our *COE* measure (Guay et al. 2011). We expect the coefficient on *BIAS* to be positive if the market "backs out" the bias. We include fixed effects for the base country, industry (Fama-French 17 classification), and year and we cluster standard errors by firm (Petersen 2009).[18] We also winsorize all continuous variables at the 1st and 99th percentiles.

We expand equation (1) to examine our subsequent hypotheses.

$$COE_{it} = \beta_0 + \beta_1 HAVEN_{it} + \beta_2 TAXRISK_{it} + \beta_3 HAVEN_{it} \times TAXRISK_{it} + Controls + \varepsilon_{it} \quad (2)$$

$$COE_{it} = \theta_0 + \theta_1 HAVEN_{it} + \theta_2 LOWAFOL_{it} + \theta_3 HAVEN_{it} \times LOWAFOL_{it} + Controls\ s + \varepsilon_{it} \quad (3)$$

$$COE_{it} = \delta_0 + \delta_1 HAVEN_{it} + \delta_2 HAVEN_{it} \times Low\ Legal\ Protection_{t} + Controls + \varepsilon_{it} \quad (4)$$

COE is the cost of equity capital (defined previously). *Controls* refers to the control variables and fixed effects from equation (1). Equation (2) investigates whether tax risk enhances the association between tax haven incorporation and the cost of capital (Hypothesis 2). Our primary proxy for tax risk (*TAXRISK*) is the 5-year standard deviation of *TAXAVOID*, which measures the volatility of firms' tax outcomes.[19] Hypothesis 2 predicts a positive β_3. We also expect the main effect of *TAXRISK* to be positive, so we predict β_2 will be positive.

Equation (3) investigates whether information risk impacts the association between tax haven incorporation and the cost of capital (Hypothesis 3). Our information risk proxy is low analyst following (*LOWAFOL*). Prior studies document that higher analyst coverage reduces the

[17] We use return volatility rather than beta following Hail and Leuz (2006), who propose that the use of beta in cross-country studies to measure risk may be problematic because the degree of market integration differs across countries and the covariance of firms' returns with market returns differs in emerging markets.

[18] Since we include base country fixed effects, the interpretation of *HAVEN* is the cost of capital premium for firms incorporated in tax havens compared to nonhaven MNCs in the same base country. Inferences are also unchanged by clustering standard errors by base country.

[19] We mean-center *TAXRISK* so that the main effect of *HAVEN* can be interpreted as the effect of tax haven incorporation for firms with average tax risk.

cost of equity capital (e.g., Botosan 1997; Easley and O'Hara 2004) and reduces manager misbehavior (e.g., Burns et al. 2010; Karpoff and Lou 2010). Recent evidence suggests that analysts understand corporate taxes relatively well (Bratten et al. 2017; Donelson et al. 2017; Mauler 2019), so we expect analysts to help to interpret and mitigate uncertainty regarding the effects of tax haven incorporation. *LOWAFOL* is an indicator variable equal to one if the firm's *AFOL* is lower than the sample median. Hypothesis 3 predicts a positive θ_3.

Equation (4) tests whether base country-level legal protections impact the association between tax haven incorporation and the cost of capital (Hypothesis 4). We use two proxies for legal protections. Our first proxy considers the general rule of law in the firm's base country, using the rule of law ranking from the World Bank database. *LOWLAW* is an indicator variable equal to one if the base country's average rule of law over the sample period is below the median of our sample countries. Our second proxy considers board-specific legal protections that could help reduce agency costs associated with directors' self-dealing (i.e., activities that primarily benefit the director rather than the company). We use the director legal liability ranking from the World Bank database to measure the extent of directors' legal liability against self-dealing. *LOWDIRLIAB* is an indicator variable equal to one if the base country's average director liability index over the sample period is below the median of our sample countries and zero otherwise.[20] Hypothesis 4 predicts a positive δ_2 using either legal protection measure.

Sample selection

Table 1, panel A, presents details on the sample selection procedure. We obtain data from Atwood and Lewellen (2019), who hand collect information (including the base country) for decentered firms with tax haven parents in the Compustat North America and Compustat Global

[20] Base country fixed effects capture the main effects of *LOWLAW* and *LOWDIRLIAB* (Hanlon et al. 2015).

databases from 1990 through 2013. Following Atwood and Lewellen (2019), we designate a firm as a "tax haven firm" (*HAVEN* = 1) if (i) the firm's parent entity is legally incorporated in a tax haven country in year *t* using the list of tax haven countries from Dyreng and Lindsey (2009), and (ii) the firm is headquartered or primarily operates in a different "base" country.[21] Because our research question involves identifying the effects of strategic tax haven incorporation, our interest is in comparing *decentered* tax haven firms to nonhaven MNCs. Therefore, following Atwood and Lewellen (2019), we require that the base country be different from the tax haven country to treat the firm as a tax haven firm.[22] We drop firms where the base country is unknown to ensure that our inferences are not confounded by uncontrolled country-level differences.

We limit our sample to MNCs because the operations and tax avoidance strategies of solely domestic firms are likely not comparable to tax haven firms, which are multinational by construction, and because multinationality can affect a firm's cost of capital (Shapiro 1978; Stulz 1999). We also drop firms that are subsidiaries of other corporations, firm-years without exchange rates available for the country-year, firm-years with total assets or total sales of less than one million (local currency), and financial firms (SIC 6000-6999). To ensure that differences in the country composition of our sample do not affect our tests, we limit the sample to a sample of countries with both tax haven and nonhaven MNCs. Finally, we obtain financial information from

[21] Following Atwood and Lewellen (2019), a firm's base country is the nonhaven country first identified using this algorithm: (i) the country where the firm was incorporated prior to incorporating in the tax haven, (ii) the country where the firm is headquartered, (iii) the country where the firm generates more than 50% of its revenue or has more than 50% of its assets, or (iv) the country of the firm's primary operating subsidiary (Allen and Morse 2013).

[22] Two countries in our sample qualify as both tax haven countries and base countries: Ireland and Singapore. We treat firms based in these countries as tax haven firms only if the firm incorporated in another tax haven country, because firms that are based and incorporated in these countries likely became so exogenously rather than due to tax reasons. For example, a firm that operates primarily in the United States and is incorporated in Ireland would be classified as a tax haven firm, but a firm that operates primarily in Ireland and is also incorporated in Ireland would be treated as a nonhaven firm. In untabulated robustness tests, we also drop firms that are incorporated and based in tax havens, and alternatively classify them as tax haven observations. Our results are robust to each of these alternative specifications.

Compustat, analysts' earnings forecast data from I/B/E/S, stock price data from Compustat Global and CRSP, and we drop firm-years missing data to calculate the variables used in the study.

Our final sample includes 2,285 tax haven firm-years (574 unique firms) and 39,195 nonhaven firm-years from 22 base countries and 20 tax havens. Table 1, panel B, provides a breakdown of our sample by base country. Our sample is concentrated in major base country economies such as the United States, China, and the United Kingdom.[23] We break tax haven observations into inversion and noninversion observations in this panel. We also list the rule of law and director liability index in each base country. To further understand our sample, panel C of Table 1 provides a matrix that indicates both the base country and tax haven country for tax haven observations. This matrix suggests that regardless of base country, most tax haven firms incorporate in small island tax havens with zero percent tax rates (e.g., Bermuda, Cayman Islands), consistent with tax savings being an important motive for tax haven incorporation.[24]

4. Results

Hypothesis tests

Table 2 displays descriptive statistics for our sample (N = 41,480). The average cost of equity capital (*COE*) for this sample is 13.2%, similar to other studies examining the cost of capital in international settings (e.g., 13.96% in Hail and Leuz 2006). However, the average *COE* for tax haven observations is 15.6% while the average *COE* for nonhaven observations is 13.1%. These

[23] Following Atwood and Lewellen (2019), we classify regions claimed by the People's Republic of China (mainland China and Hong Kong in our sample) as a single base country since firms incorporated therein generally operate in China. In untabulated results, we classify China and Hong Kong as separate nonhaven base countries, with consistent results.

[24] Some commonly-used lists of tax haven countries include Hong Kong and Malaysia as tax havens (not included in the Dyreng and Lindsey list). All Compustat Global firms in our sample that are incorporated in Malaysia (Hong Kong) are based in Malaysia (China). Thus, there are no decentered firms in these countries, so they do not appear in our tax haven sample.

univariate statistics are consistent with tax haven incorporation being associated with a higher cost of equity capital.

Table 3 provides the analysis of Hypothesis 1. Column (1) presents results using the pooled sample. As predicted in Hypothesis 1, column (1) shows a positive and statistically significant coefficient estimate on *HAVEN*, suggesting that tax haven incorporation is associated with a significantly higher cost of equity capital ($\beta_1 = 0.0219$, $p < 0.01$) compared to nonhaven firms. In terms of economic significance, our results suggest that tax haven firms experience a cost of equity capital of approximately 16.59% higher than the sample average, after controlling for tax avoidance. All control variables load as expected. Most notably, the coefficient on tax avoidance (*TAXAVOID*) is significantly negative, consistent with Goh et al. (2016) [25] and the coefficient on unexpected tax avoidance (*TXDIFF*) is significantly positive, consistent with Cook et al. (2017). Collectively, our results suggest that, to investors, the future cash flow risks of tax haven incorporation may be greater than the benefits of tax savings.

One concern may be that prevalent base countries in our tax haven sample (e.g., China or the United States) drive the results in column (1). To address this potential concern, we re-examine Hypothesis 1 among multiple subsamples: US-based firms in column (2); non-US, non-Chinese-based firms in column (3); and Chinese-based firms in column (4). Importantly, the results are consistent across all four columns, suggesting that these subgroups do not drive our results. Still, the magnitude of the tax haven cost of capital premium varies across these subgroups. It is highest for firms based in China ($\beta_1 = 0.0257$, $p < 0.01$) at 19.09% higher than the mean Chinese cost of

[25] In our sample, moving from the 25th to the 75th percentile of *TAXAVOID* results in a (0.0092- (-0.0028))*$\beta_1 = 0.012 \times 0.1943$ (Table 3, column (2)) = 23 bps decrease in *COE*. Similarly, Goh et al. (2016) report among US firms that greater tax avoidance is associated with decreases in the cost of equity ranging from 19 to 26 bps. Intuitively, it seems reasonable that the tax haven effect is larger than the effect of tax avoidance because tax haven incorporation affects many aspects of business, while tax avoidance is more limited in scope.

equity (untabulated), and lowest for those based in the United States ($\beta_1 = 0.0072$, $p < 0.05$) at 5.71% higher than the mean US cost of equity (untabulated). Overall, the results of Table 3 indicate that, while the specific magnitude of the effect varies between countries, tax haven incorporation is associated with a significantly higher cost of equity capital for a broad set of countries.[26]

Table 4, panel A, contains the results of tests of Hypotheses 2, 3, and 4. We present the results of the tax risk model (Hypothesis 2) in column (1). We find a positive and statistically significant coefficient estimate on the main effect of *HAVEN* ($\beta_1 = 0.0182$, $p < 0.01$), providing evidence that tax haven incorporation is associated with a higher cost of capital for firms with average tax risk (since *TAXRISK* is mean-centered). The coefficient estimate on the interaction term *HAVEN*×*TAXRISK* is also significantly positive ($\beta_3 = 0.2274$, $p < 0.05$), indicating that a one-standard-deviation increase in tax risk (0.028 per Table 2) is associated with a 0.64 percentage point higher (a 4.8% higher) cost of equity capital for tax haven firms. The evidence in column (1) supports Hypothesis 2, suggesting that tax risk magnifies the cost of capital premium in tax haven firms.[27]

Columns (2) through (4) of Table 4, panel A, focus on the nontax risks associated with tax haven incorporation. Column (2) presents the results of the information risk model (Hypothesis 3). The coefficient estimates on the main effects of low analyst following (*LOWAFOL*, $\theta_2 = 0.0067$, $p < 0.01$) and *HAVEN* ($\theta_1 = 0.0156$, $p < 0.01$) are significantly positive, as expected. Meanwhile, consistent with Hypothesis 3, the coefficient estimate on *HAVEN*×*LOWAFOL* is significantly

[26] We also repeat our tests, excluding each base country's observations individually. Our results are not materially affected by dropping any single country.

[27] A potential concern is that our tax risk proxy merely captures variation in tax avoidance levels. In an untabulated test, we re-estimate equation (2) interacting *HAVEN* with *TXDIFF* and we find that the coefficient estimate on *HAVEN*×*TXDIFF* is statistically insignificant. This test corroborates that tax risk (*TAXRISK*) is indeed a different construct than the unexpected tax avoidance captured by *TXDIFF*.

positive ($\theta_3 = 0.0105$, $p < 0.01$), providing evidence that low levels of analyst following intensifies the information risk present in tax haven firms.[28]

We present the results of the rule of law and the director liability analyses testing Hypothesis 4 in columns (3) and (4), respectively, of Table 4, panel A. In both columns, the coefficient estimate on *HAVEN* is significantly positive (column (3): $\delta_1 = 0.0167$, $p < 0.01$; column (4): $\delta_1 = 0.0148$, $p < 0.01$). The coefficient estimates on *HAVEN*×*LOWLAW* ($\delta_2 = 0.0085$, $p < 0.05$) in column (3) and *HAVEN*×*LOWDIRLIAB* ($\delta_2 = 0.0112$, $p < 0.05$) in column (4) are both significantly positive, supporting Hypothesis 4. These results suggest that a weaker legal environment in the firm's base country, both in the form of low rule of law and lower director anti-self-dealing laws, is associated with higher legal risk for equity holders and magnifies the higher cost of capital for tax haven firms. However, even in countries with strong legal environments where manager diversion risk is lower, we continue to observe a higher cost of capital associated with tax haven incorporation. This result suggests that the higher cost of capital associated with tax haven incorporation is not only an indirect effect of a higher risk of manager diversion (Lambert et al. 2007) but also a direct effect of future cash flow uncertainty.

In panel B of Table 4, we combine the models from panel A of Table 4 by including our tax risk, informational risk, and legal risk variables interacted with *HAVEN* all within the same model. In columns (1) and (2), which include the full sample, we find positive and significant coefficient estimates on all the *HAVEN* interactions: *HAVEN*×*TAXRISK*, *HAVEN*×*LOWAFOL*, and *HAVEN*×*LOWLAW* (column (1)) or *HAVEN*×*LOWDIRLIAB* (column (2)). We find a

[28] We also use abnormal accruals as an alternate information risk proxy using the three-year standard deviation of residuals from Dechow and Dichev (2002) and firm-specific abnormal accruals (Francis and Wang 2008). We replace *LOWAFOL* in equation (3) with these proxies. In an untabulated test, we find significantly positive coefficient estimates on interactions of *HAVEN* and both abnormal accruals proxies, consistent with our primary results.

significantly positive coefficient estimate on the main effect of *HAVEN*, suggesting that these three risk factors do not fully explain the higher cost of capital for tax haven firms. Using the *HAVEN* interaction coefficient estimates in column (1), we compute that for tax haven firms, a one-standard-deviation change in *TAXRISK* changes *COE* by 0.0070; going from zero to one on *LOWAFOL* changes *COE* by 0.0068; and going from zero to one on *LOWLAW* changes *COE* by 0.0077. Thus, the economic magnitudes of a one-standard-deviation or one-unit change in each of these risks are similar, and the total magnitude effect of a one-unit change in these factors for tax haven firms on *COE* is 0.0215. Given the total magnitude of the *HAVEN* effect (*HAVEN* plus a one-unit change in the *HAVEN* interactions) is 0.0311, the interaction terms together explain 69% of the total *HAVEN*-dependent variation in *COE*.[29] Similarly, in column (2) the interaction terms together explain 78% of the total *HAVEN*-dependent variation in *COE*.

In columns (3) and (4), which includes only the non-Chinese subsample, we obtain qualitatively similar results, although the statistical significance is somewhat lower. The interaction of *HAVEN*×*LOWLAW* is not significant in column (3), suggesting that, among non-Chinese-based firms, low rule of law is not associated with an incrementally higher cost of capital in tax haven firms compared to nonhaven firms. In other words, the incremental tax haven cost of capital premium associated with low rule of law appears to be driven by Chinese firms. However, the legal environment remains meaningful outside of China, as we observe a significantly positive coefficient estimate on *HAVEN*×*LOWDIRLIAB* in column (4). Further, in column (4), the interaction terms seem to explain most of the tax haven cost of capital premium, as the main effect

[29] For example, using the results presented in column (1), the coefficient estimate on *HAVEN*×*TAXRISK* is 0.2489. A one-standard-deviation change in *TAXRISK* is 0.028 (from Table 2). The product of these, 0.007, is the change in *COE* for a one-standard-deviation change in *TAXRISK* for tax haven firms. For tax haven firms, a one-unit change in *LOWAFOL* is associated with a change in *COE* of 0.0068 and a one-unit change in *LOWLAW* is associated with a change in *COE* of 0.0077. A one-unit change in *HAVEN* is associated with a change in *COE* of 0.0096. Therefore, the interaction terms explain (0.007+0.0068+0.0077) / (0.007+0.0068+0.0077+0.0096) = 69% of the total *HAVEN*-related variation in *COE*.

of *HAVEN* is statistically insignificant. From this analysis, we conclude that tax, informational, and legal risks are each separately and jointly significant in explaining the association between tax haven incorporation and the cost of equity.

Additional analyses

Inversion test

A corporate inversion occurs when an established firm reincorporates its parent company in a low tax country. Inversion offers an appealing difference-in-differences research design wherein we can compare firms across the pre- and post- inversion periods to identify more precisely corporate outcomes associated with the change of domicile. The drawbacks to using corporate inversions are rarity and selection bias. Our sample contains 34 inversion firms yielding 242 (189) pre (post) inversion observations. We construct a firm-constant binary variable, *INVERSIONFIRM*, equal to one for firms that invert at any point, and zero otherwise. We also construct a binary variable, *POST*, equal to one (zero) following (before) a firm's inversion. Thus, the interaction term *INVERSIONFIRM×POST* is a difference-in-difference estimator identifying firm-specific differences in the post-inversion period. We create another indicator variable that is equal to one for noninversion tax haven observations *(HAVEN_NONINV*) and zero otherwise. To begin, we present the results of a base model estimation in column (1) of Table 5, panel A. The coefficient estimate on the main effect of *INVERSIONFIRM* is statistically insignificant (φ_1 = -0.0047, $p > 0.10$), suggesting that the cost of capital for inversion firms in the pre-inversion period does not differ from that of control firms. We find a significantly positive coefficient estimate on *INVERSIONFIRM×POST* (φ_2 = 0.0222, $p < 0.01$), which indicates that inverting firms' cost of

equity capital increased following the inversion transaction.[30,31] Finally, the coefficient estimate on *HAVEN_NONINV* is significantly positive ($\varphi_3 = 0.0224$, $p < 0.01$), consistent with our baseline results in Table 3. In addition, there is no significant difference (untabulated) between the coefficient estimates on *INVERSIONFIRM×POST* and *HAVEN_NONINV,* suggesting that the association between tax haven incorporation and the cost of equity is similar across the two types of incorporation methods.

We follow recent research using staggered difference-in-difference research designs (e.g., Blankespoor et al. 2018; Balakrishnan et al. 2019) and test for parallel trends by including several lag and lead terms and the current term of *INVERSIONFIRM* where the year of inversion is year *t*. We present the results of this analysis in column (2) of Table 5, panel A. None of the coefficient estimates on the lagged *INVERSIONFIRM* terms is statistically significant, suggesting the existence of parallel trends. Meanwhile, the coefficient estimates on *INVERSIONFIRM* in the inversion year and thereafter are positive and statistically significant, consistent with inversion to a tax haven being associated with an upward shift in the cost of equity capital.

The results of our inversion firm analysis corroborate our main results. A caveat to this analysis is that it is possible that only firms with relatively high expected net benefits of inversion choose to actually invert, suggesting this estimate may be a lower bound on the actual cost of equity premium in the population. Nonetheless, studying inversion firms' post-inversion outcomes is relevant in its own right (Hanlon and Heitzman 2010).

Entropy balancing

[30] The main effect of *POST* is excluded because it is collinear with *INVERSIONFIRM×POST* as year fixed effects, rather than *POST*, control for time trends in the control group.

[31] We also perform this test in a subsample of non-Chinese based firms and obtain consistent inferences. Our sample includes only four Chinese inversion firms.

Selection bias could occur in our study if firms that choose to incorporate their parent company in a tax haven differ systematically from nonhaven firms. For example, it seems plausible that only those firms with the greatest expected net benefits of tax haven incorporation follow through with tax haven incorporation. We address this concern through entropy balancing, which we use to reweight the observations so that the mean and variance of all covariates are not statistically different between the treatment and control samples (Hainmueller 2012). Entropy balancing emulates a matched sample but does not result in significant sample attrition like other potential matching methods.

A second selection concern has to do with the nature of offshore incorporation. Some firms incorporate in a tax haven initially (noninversion types), while others move their parent company from a nonhaven country to a tax haven (inversion types). Thus, it is plausible that our results differ by the type of tax haven incorporation. We conduct entropy balancing within the noninversion types and inversion types separately and estimate regression analyses for these groups, presenting the results in Table 5, panel B. In columns (1) and (2), our model includes year, industry, and base country fixed effects. In column (1), the coefficient estimate on *HAVEN* estimates the cost of capital premium for noninversion type tax haven firms relative to nonhaven firms. Column (2) compares inversion types and nonhaven firms; therefore, the coefficient on *INVERSIONFIRM*×*POST* is the difference-in-difference estimator. Finally, column (3) contains results only for inversion type firms where each inverting firm serves as its own control in the absence of fixed effects; therefore, the coefficient on *POST* is the difference-in-difference estimator. Across all three tests, we find significantly positive coefficient estimates on *HAVEN* (column (1)), *INVERSIONFIRM*×*POST* (column (2)), and *POST* (column (3)), consistent with our primary results. The consistent results across different types of tax haven incorporation, and in

multiple entropy-balanced samples, provide confidence that selection bias does not likely drive our results. However, we caution that if there are unobservable factors causing selection bias, we cannot completely rule it out as an alternative explanation for our findings.

Additional analyses linking tax haven incorporation to tax risk

Hypothesis 2 proposes that tax haven incorporation provides additional opportunities for earnings stripping that can increase tax risk (e.g., Dyreng et al. 2019), which increases the positive association between tax haven incorporation and the cost of capital. We provide alternative evidence supporting Hypothesis 2 by using alternative proxies for tax risk and linking tax haven incorporation to aggressive income shifting. We begin by considering whether tax haven incorporation is associated with greater income shifting using the methodology developed by Klassen and Laplante (2012), which estimates the prevalence of income shifting by regressing the five-year average foreign return on sales (*AvgFROS*) on a five-year average tax incentive to shift income abroad (*LowAvgFTR*×*AvgFTR*).[32] A negative coefficient on *LowAvgFTR*×*AvgFTR* indicates outbound income shifting. We estimate the model using firms with data available in our sample and interact each of the Klassen and Laplante (2012) model variables with *HAVEN*. Panel A of Table 6 presents the results of our income shifting test. Column (1) presents results for all base countries with at least 10 observations, while column (2) presents results for US-based firms only. We find significantly negative coefficient estimates on *LowAvgFTR*×*AvgFTR*×*HAVEN* in

[32] Klassen and Laplante (2012) estimate the following model: $AvgFROS_{it} = \alpha_0 + \beta_1 AvgRoS_{it} + \beta_2 HighAvgFTR_{it} + \beta_3 LowAvgFTR_{it} \times AvgFTR_{it} + \beta_4 HighAvgFTR_{it} \times AvgFTR_{it} + \Sigma \beta_{5k} Industry_{it} + \Sigma \beta_{6k} Year_{it}$. *AvgFROS* is the five-year sum of foreign pretax income (PIFO) scaled by the five-year sum of foreign sales from Compustat segment data. *AvgFTR* proxies for the incentive to shift income between the base country and other countries and is defined as the five-year sum of foreign tax expense (TXFO+TXDFO) divided by the five-year sum of foreign pretax income (PIFO) less the five-year average statutory tax rate in the base country. *LowAvgFTR* proxies for the incentive to shift income out of the base country and is calculated as an indicator variable equal to one if *AvgFTR* is less than or equal to zero. The coefficient on *LowAvgFTR*×*AvgFTR* estimates tax-motivated income shifting out of the base country.

both regressions, suggesting that on average tax haven firms shift more income abroad compared to nonhaven firms.

We then consider whether tax haven incorporation is associated with greater tax uncertainty. In panel B of Table 6, we use unrecognized tax benefit (UTB) data in Compustat, which is available from 2007-2013 during our sample period, and we compare UTBs between tax haven and nonhaven firms. We find univariate evidence that tax haven firms have higher current UTB additions (*CYUTBINC*, $p < 0.05$) and higher penalties and interest accrued on the income statement (*UTBPEN_IS*, $p < 0.05$) and the balance sheet (*UTBPEN_BS*, $p < 0.05$) compared to nonhaven firms. While the sample size is small, this test provides some evidence that tax haven firms engage in higher-risk tax strategies. In sum, panels A and B of Table 6 help substantiate our assumption that tax haven firms engage in more aggressive income shifting strategies and face greater tax risk.

Our primary empirical proxy for tax risk in testing Hypothesis 2 is the ex post volatility of tax outcomes. However, firms with different levels of ex ante tax risk can arrive at the same ex post tax outcomes (Neuman et al. 2020). For example, firms with differing levels of income shifting activity could arrive at the same tax outcomes if none of the firms' transfer pricing strategies are examined or challenged by tax authorities. Thus, tax outcome volatility may be an incomplete measure of tax risk. In panel C of Table 6, we use three alternative measures of ex ante tax risk based on firms' propensity to shift income. Research strongly links intangible intensity and income mobility to income shifting (e.g., Harris 1993; Klassen and Laplante 2012; De Simone, Mills, and Stomberg 2019). In column (1), *RD* is the firm's level of research and development (R&D) activity scaled by total sales. In column (2), we use the differential level of R&D relative to the firm's peers in the same base country, industry, and year (*RDDIFF*). In column (3),

MOBIND is a dummy variable equal to one for firms operating in income-mobile industries and zero otherwise (De Simone et al. 2019). We replace *TAXRISK* in equation (2) with each of these proxies to provide additional evidence supporting Hypothesis 2. The coefficient estimates on the interactions of each of these tax risk variables with *HAVEN* are positive and statistically significant, consistent with inferences from our primary test of Hypothesis 2. This test provides evidence that both ex ante and ex post tax risk magnify the cost of equity premium associated with tax haven incorporation.

One concern with our tests of Hypothesis 2 is that tax haven incorporation and/or income mobility may increase general firm risk, so it is important to understand whether tax uncertainty or general firm uncertainty explains the cost of capital premium for tax haven firms. To address this issue, we perform an untabulated falsification test. We compute the volatility of the firm's operating cash flows (*σOCF)*, which is the five-year standard deviation of operating cash flows (OANCF) scaled by total assets. We then interact this variable with *HAVEN*. We replace *TAXRISK* and *HAVEN×TAXRISK* in equation (2) with *σOCF* and *HAVEN×σOCF*. While we find positive and statistically significant main effects on *σOCF* and *HAVEN*, the coefficient estimate on *HAVEN*σOCF* is statistically insignificant. Thus, this test provides evidence that the results of tests of Hypothesis 2 relate to tax uncertainty rather than general firm uncertainty.

Alternate cost of capital measures

Since analysts' expectations that factor into the ex ante cost of capital often differ from realized performance, we analyze two returns-based measures, *RET* and *σRET*, which we previously used as control variables, as crude alternative proxies for the cost of equity capital. We present the results of this analysis in columns (1) and (2) of Table 7. We also estimate our regression using the cost of debt capital, with results presented in column (3) of Table 7. We

measure the cost of debt (*COD*) as the effective interest rate on long-term debt following Hail and Leuz (2006) and Francis et al. (2005).[33] Consistent with inferences from our primary analyses, tax haven incorporation is associated with a higher cost of capital using each of these alternative proxies.

Decentering analysis

A potential concern is that our findings could be documenting a cost of capital impact of the more general decentering of the firm, rather than the specific effect of incorporating in a tax haven country. Decentering to a tax haven can substantially weaken shareholder rights due to the lack of transparency and shareholder protections applicable to offshore firms incorporated in tax haven countries (Kun 2004; Moon 2018). In contrast, with other types of decentering, there is no clear directional prediction on how the decentering would affect shareholder rights, because it depends on how features of the decentered country compare to the base country. In addition, nonhaven countries generally do not have distinctive features such as low transparency, lack of information sharing, and unique laws limiting shareholder rights such as those that limit minority shareholders' abilities to access corporate records or bring derivative suits. For these reasons, we expect tax haven decentering to have a larger effect on the cost of capital than nonhaven decentering.

We test this prediction empirically. We define a decentered firm as a firm that is incorporated or primarily lists outside of its base country (Desai 2009). Our primary tests include 1,536 control (*HAVEN* = 0) observations that are decentered to nonhaven countries. In untabulated review, Canada, the United States, and the Netherlands are the three base countries with the

[33] For the *COD* sample, we retain all observations where we can calculate *COD* from the same 22 base countries as our primary COE tests and with all control variables. Following Pittman and Fortin (2004), we truncate *COD* at the 5th and 95th percentiles. We remove *BIAS* from the *COD* regression because of concerns that *BIAS* is specific to the analysts' forecasts used to calculate *COE*.

greatest numbers of nonhaven decentered observations at 662, 215, and 142 observations, respectively.[34] We augment equation (1) by adding an indicator variable equal to one for nonhaven decentered firm-years (*Decentered Nonhaven*) and zero otherwise. We present the results of this analysis in Table 8. In column (1), we present the results of this analysis with our full sample. We find significantly positive coefficient estimates on *Decentered Nonhaven* ($\beta_2 = 0.0090$, $p < 0.05$) and *HAVEN* ($\beta_1 = 0.0223$, $p < 0.01$) and the coefficient estimate on *HAVEN* is significantly larger than that of *Decentered Nonhaven* ($\beta_1 - \beta_2 = 0.0133$, $p < 0.01$). In column (2) we also examine the tax haven effect among a sample of only decentered firms (dropping *Decentered Nonhaven* due to collinearity and dropping the fixed effects due to the small sample size). The coefficient estimate on *HAVEN* is significantly positive ($\beta_1 = 0.0104$, $p < 0.01$), denoting an incremental cost of capital for tax haven decentered firms versus other decentered firms. Overall, this analysis indicates that tax haven decentering is distinct from nonhaven decentering.[35]

Untabulated robustness tests

To further validate our results, we perform several untabulated analyses. First, to differentiate tax haven parent incorporation from tax haven subsidiary incorporation, we harvest subsidiary data from Bureau van Dijk (BvD) and augment equation (1) with an indicator variable identifying tax haven subsidiary use.[36] The coefficient estimate on the haven subsidiary variable is marginally negative, providing evidence that tax haven subsidiary use does not increase (and

[34] It is somewhat common for Canadian and Dutch firms to be incorporated and listed in a nearby country with a larger capital market. For example, lululemon athletica inc. is a Canadian firm incorporated in Delaware and Royal Dutch Shell PLC is a Dutch firm incorporated in the United Kingdom.

[35] In an untabulated robustness test, we drop Chinese firms from the decentering analysis. We find only 102 decentered Chinese nonhaven firm-years in our sample. Inferences from Table 8 remain consistent when excluding Chinese firms.

[36] BvD data are not historical. Therefore, our indicator variable for tax haven subsidiaries is equal to one if the firm reports a tax haven subsidiary as of 2018 (zero otherwise). Approximately 55% of our sample firms report a tax haven subsidiary in BvD, similar to the percentages of US multinational firms with tax haven subsidiaries reported by other studies (e.g., Dyreng and Lindsey 2009; Dyreng and Markle 2016).

may in fact decrease) risk to equity holders. Meanwhile, the coefficient estimate on *HAVEN* remains positive and statistically significant.

Second, we examine the robustness of our primary results to alternative cost of capital proxies following (i) Claus and Thomas (2001), (ii) Ohlson and Juettner-Nauroth (2005), and (iii) Gebhardt et al. (2001), along with an average of the four measures (including *COE*). The sample sizes are smaller using the alternative COE proxies due to data requirements. Nonetheless, we find consistent results for three of the four alternatives.

Third, our primary models use fixed effects to control for unobservable differences between base countries. This approach does not provide information about the relative extent to which the base country influences the cost of capital. We investigate the variation in the model explained by unobservable base country fixed effects using hierarchical linear modeling (HLM) where we group firms by base country and include random base country intercepts. In untabulated analyses, the interclass correlation coefficient (ICC) for the base country is 0.03, suggesting that the base country explains approximately 3% percent of the variation in *COE*.[37] The coefficient estimate on *HAVEN* continues to be statistically significant when using HLM. In sum, our results are not sensitive to this method of controlling for unobservable base country differences.[38]

Finally, while the definition of a "tax haven" is well established, the countries included in different tax haven lists used by researchers vary slightly. For this reason, we examine the sensitivity of our results to excluding different tax havens. We find that our results are robust to

[37] Lee (2000) and Beardsley et al. (2020) consider ICCs greater than 10% nontrivial, warranting consideration of multilevel methods.

[38] Since the *HAVEN* designation relies on the country of incorporation (rather than the base country) we also estimate HLM clustering firms into groups based on the country of incorporation. The ICC for the incorporation country is 0.044 and *HAVEN* continues to be significantly positive. Thus, our results are not sensitive to controlling for unobservable differences in the country of incorporation.

dropping each tax haven country individually, suggesting that none of the individual tax havens in our sample drive our results.

5. Conclusion

We examine the association between decentering a firm's parent company to a tax haven and the cost of equity capital. Tax haven incorporation offers significant tax savings yet is not without risks. We predict that the tax, information, and legal risks connected with legal incorporation in a tax haven are associated with a demand for a higher risk premium by equity holders. We investigate this question empirically in a large, international sample of firms between the years 1990 and 2013. We find that, on average, the cost of equity premium associated with tax haven incorporation is 15.8% higher than the mean cost of equity in the sample. This premium ranges from 5.71% to 19.09% across various geographic subsamples. We find that tax, information, and base country legal risks are associated with an incrementally higher cost of equity premium for tax haven firms.

We provide important evidence on the implications of tax havens and decentering for firms' cost of capital. We contribute to the prominent discussion on corporate inversions because a subsample of our tax-haven-incorporated firms are inverted firms. The evidence we present of a higher cost of equity capital is some of the first evidence of tax risks (as opposed to tax avoidance levels) and nontax costs of tax haven incorporation. While we do not measure the overall net cost or benefit of tax haven incorporation, identifying these risks and costs is important in providing answers to research that suggests the existence of costs that largely offset the benefits of tax haven incorporation (e.g., Cloyd et al. 2003; Lusch et al. 2019). Our study provides evidence of nontax costs that may factor into firms' decisions regarding tax haven incorporation. Finally, we build upon the literature that specifically examines how corporate taxation relates to the cost of capital (Hasan et al. 2014; Goh et al. 2016; Cook et al. 2017). Since we control for tax avoidance, our

study provides evidence of a cost of capital premium associated with the tax and nontax risk ramifications of a tax strategy. Our findings suggest that tax haven incorporation has important costs to consider in conjunction with its potential tax savings.

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Appendix
Variable definitions

Variables of interest	
HAVEN	An indicator variable equal to one if the firm is a tax haven firm in year *t,* zero otherwise
COE	The ex ante cost of equity capital is measured by r_{PEG} following Francis, Khurana, and Pereira (2005). r_{PEG} is calculated as: $\sqrt{\frac{eps2-eps1}{P_0}}$ where: r_{PEG}= ex ante cost of equity capital, where PEG refers to price-earnings growth model; eps_1 = the one-year ahead mean analysts' earnings forecast per share; eps_2 = the two-year ahead mean analysts' earnings forecast per share; P_0 = the price per share at fiscal year-end.[39]
TAXRISK	The five-year standard deviation of *TAXAVOID* from year *t-4* to year *t*
LOWAFOL	Indicator variable equal to one if *AFOL* is less than the median *AFOL* in year *t*, zero otherwise
LOWLAW	Indicator variable equal to one if the average over the sample period of the ranking of rule of law in the base country is less than or equal to the sample median, zero otherwise. Rule of law measures "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al. 2010, 4). Data retrieved from http://info.worldbank.org/governance/wgi/#home
LOWDIRLIAB	An indicator variable equal to one if the average over the sample period of the extent of director liability index in the base country is less than or equal to the sample median, zero otherwise. Data retrieved from http://www.doingbusiness.org/custom-query under the "protecting minority investors" data category
Control variables	
TAXAVOID	Tax avoidance (from Atwood and Lewellen 2019), calculated as estimated total income tax (pre-tax income multiplied by the base country statutory tax rate) minus total tax expense (TXT), divided by total assets (AT) in year *t*
TXDIFF	The absolute difference between *TAXAVOID* and the median *TAXAVOID* for the firm's Fama-French 17 industry and year
SIZE	Log of total assets at fiscal year-end, first translated into US dollars
EBITDA	Earnings before interest, interest, tax, depreciation, and amortization (EBITDA) scaled by beginning of year total assets (AT)
σEBITDA	The three-year standard deviation of *EBITDA* by firm
LEV	Average total debt (average of beginning and ending DLTT+LCT) divided by total assets. Set to zero if missing
BTM	The ratio of the book value of equity to the market value of equity
AFOL	The natural logarithm of 1+ number of analysts following the firm in year *t*
RET	The annual buy and hold return

[39] We require that analysts' forecasts for years *t*+1 and *t*+2 be issued within the 90 days before year-end for year *t*. We use the closest stock price from I/B/E/S within 90 days of year-end.

σRET	The firm's standard deviation of monthly returns for year *t*
BIAS	Bias in analysts' forecasts, calculated as the one-year ahead mean analysts' earnings forecast per share minus actual EPS for year t+1, scaled by the stock prices from I/B/E/S at fiscal-year-end at time t

Variables for additional analyses

INVERSIONFIRM	An indicator variable equal to one for the firm if *HAVEN* is equal to one at some point during the sample period and the firm has at least one year pre- and post-tax haven incorporation, zero otherwise
POST	An indicator variable equal to one following the effective date of the firm's inversion, zero otherwise
HAVEN NONINV	An indicator variable equal to one if *HAVEN* is equal to one and the firm is not an inversion firm (*INVERSIONFIRM* = 0), zero otherwise
RD	The absolute level of the firm's R&D activity, calculated as R&D expense (XRD) scaled by total sales (SALE)
RDDIFF	The relative level of the firm's R&D activity, calculated as *RD* minus the median *RD* for the firm's base country, industry, and year
MOBIND	An indicator variable equal to one if the firm is in an income-mobile industry, as defined by industry membership in the following 3-digit SIC codes: 283, 357, 360-368, 481, 737, and 873 (De Simone, Mills, and Stomberg 2019), zero otherwise
CYUTBINC	Current-year UTB increases (TXTUBPOSINC) scaled by the beginning of period UTB balance (TXTUBBEGIN)
UTBPEN_IS	UTB interest and penalties recorded on the income statement for the current period (TXTUBXINTIS) scaled by the beginning of period UTB balance (TXTUBBEGIN)
UTBPEN_BS	UTB interest and penalties accrued on the balance sheet (TXTUBXINTBS) scaled by the beginning of period UTB balance (TXTUBBEGIN)
COD	Cost of debt, measured as interest expense (XINT) divided by the average of the beginning of year and end of year total debt. To calculate total debt, we add long-term debt (DLTT) and short-term debt (LCT-AP-TXP-LCO). Following Pittman and Fortin (2004), we remove observations outside the 5th and 95th percentiles of the total sample
Decentered Nonhaven	An indicator variable equal to one if the firm is incorporated or primarily listed in a different country than the base country (Desai 2009) and the firm is not incorporated in a tax haven, zero otherwise, zero otherwise

Income shifting estimation variables (from Klassen and Laplante 2012)

AvgFROS	Five-year foreign pre-tax return on sales, calculated as the five-year sum of foreign pre-tax income (PIFO) scaled by the five-year sum of foreign sales (from the Compustat Segments File) from year t-4 to year t
AvgROS	The five-year average worldwide pre-tax return on sales calculated as the sum of pre-tax income (PI) scaled by the sum of worldwide sales (SALE) from year t-4 to year t
AvgFTR	The five-year sum of foreign tax expense (TXFO+TXDFO) scaled by the five-year sum of foreign pre-tax income (PIFO), less the five-year average base country statutory tax rate
HighAvgFTR	The empirical proxy for firms with the incentive to shift income into the base country, calculated as an indicator variable equal to one if *AvgFTR* is greater than zero, zero otherwise

LowAvgFTR	The empirical proxy for firms with the incentive to shift income out of the base country, calculated as an indicator variable equal to one if *AvgFTR* is less than or equal to zero, zero otherwise

TABLE 1
Sample selection and sample composition

Panel A: Sample selection

	HAVEN = 1	*HAVEN* = 0	Total
Firm-years from Compustat Global (1990-2013)	33,451	349,507	382,958
Firm-years from Compustat North America (1990-2013)	5,807	226,103	231,910
Combined Sample	39,258	575,610	614,868
Less duplicate observations within both datasets	(1,158)	(8,304)	(9,462)
Initial Combined Sample	38,100	567,306	605,406
Less:			
Firm-years not incorporated in a tax haven (hand collected)	(1,751)	1,751	0
Firms headquartered in a tax haven but incorporated in a nonhaven country	0	(69)	(69)
Firms determined to be subsidiaries (>50% owned by other firm)[a]	(8,698)	(14,928)	(23,626)
Firms without information to determine base country[b]	(5,731)	0	(5,731)
Firms primarily operating in tax haven countries	(8,704)	8,704	0
Domestic-only firms [c]	0	(394,021)	(394,021)
Firm-years missing exchange rates	(20)	(6,360)	(6,380)
Firm-years with total assets or total sales	(692)	(4,822)	(5,514)
Financial firms	(462)	(3,574)	(4,036)
Countries without both tax haven and nonhaven firms	(39)	(17,229)	(17,268)
Less firms without all variables to estimate models	(9,718)	(96,605)	(106,323)
Final sample (firm-years)	2,285	39,195	41,480
Final sample (number of unique firms)	574	7,605	

TABLE 1
Sample selection and sample composition

Panel B: Sample composition and statistics by base country and by tax haven country

Base Country	Firm-Years					*Rule of Law*	*LOWLAW*	*Director Liability*	*LOWDIRLIAB*
	HAVEN = 1			*HAVEN* = 0	Total				
	Inversion	Noninversion	Total						
Argentina	0	20	20	15	35	0.32	1	2.00	1
Australia	2	21	23	1,503	1,526	0.95	0	2.00	1
Brazil	0	9	9	158	167	0.50	1	8.00	0
Canada	0	27	27	662	689	0.95	0	9.00	0
China	26	1,400	1,426	3,502	4,928	0.41	1	1.01	1
Denmark	0	3	3	551	554	0.99	0	5.00	0
France	0	5	5	2,485	2,490	0.90	0	1.00	1
Germany	0	17	17	2,243	2,260	0.93	0	5.00	0
Greece	0	54	54	162	216	0.70	1	3.49	1
India	0	3	3	836	839	0.54	1	4.00	1
Indonesia	0	16	16	111	127	0.30	1	5.00	0
Ireland	3	0	3	312	315	0.94	0	6.00	0
Israel	0	6	6	309	315	0.78	1	9.00	0
Malaysia	0	8	8	767	775	0.65	1	9.00	0
Netherlands	10	8	18	915	933	0.96	0	4.00	1
Norway	6	57	63	732	795	0.99	0	6.00	0
Singapore	0	11	11	659	670	0.92	0	9.00	0
South Africa	0	3	3	581	584	0.56	1	8.00	0
Thailand	0	7	7	288	295	0.53	1	4.32	1
Turkey	0	1	1	75	76	0.57	1	4.00	1
UK	55	111	166	4,339	4,505	0.94	0	7.00	0
US	87	309	396	17,990	18,386	0.92	0	9.00	0
Total	189	2,096	2,285	39,195	41,480				

TABLE 1
Sample selection and sample composition

Panel C: Base country: Tax haven country matrix

Base Country \ Haven Country	Netherland Antilles	Antigua	Bahamas	Bermuda	Switzerland	Cayman Isl.	Cyprus	Guernsey	Gibraltar	Isle of Man	Ireland	Jersey	Liberia	Luxembourg	Marshall Isl.	Malta	Mauritius	Panama	Singapore	British Virgin Isl.	Total
Argentina	0	0	0	3	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	2	20
Australia	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	23
Brazil	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Canada	0	0	0	3	0	0	0	0	0	0	3	0	0	0	21	0	0	0	0	0	27
China	0	3	0	624	2	694	0	0	0	0	0	5	0	0	0	0	0	0	50	48	1,426
Denmark	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
France	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Germany	0	0	0	14	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	17
Greece	0	0	0	6	1	0	0	0	0	0	0	0	2	0	45	0	0	0	0	0	54
India	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	3
Indonesia	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	16
Ireland	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Israel	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Malaysia	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Netherlands	0	0	0	4	0	0	0	2	0	0	4	0	0	8	0	0	0	0	0	0	18
Norway	0	0	0	25	0	14	9	0	0	0	0	0	0	15	0	0	0	0	0	0	63
Singapore	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
South Africa	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Thailand	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Turkey	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
UK	0	0	15	41	0	0	0	2	8	2	13	47	0	10	3	8	0	0	5	12	166
US	36	0	0	101	57	61	0	0	0	0	35	2	18	3	13	0	0	51	4	15	396
Total	36	3	18	872	66	776	9	8	8	4	55	54	20	58	82	8	7	51	73	77	2,285

Notes: Panel A presents the sample selection procedure by *HAVEN* status and the number of observations lost at each step. [a] Following Atwood and Lewellen (2019), we use ownership data from Eikon (as of 2014) to determine if the firm was a subsidiary. If the firm was a subsidiary in 2014, the firm is dropped from the sample. For firms in the tax haven sample that do not have ownership data in Eikon, information was obtained from Mergent Webreports, Worldscope, or the most recent financial report to ensure that the firm is not a subsidiary in the most recent sample year. [b] Following Atwood and Lewellen (2019), the base country is the

country first identified using the following algorithm: (i) the country where the firm was incorporated prior to incorporating in the tax haven country, or (ii) the country where the firm's executive offices are located, or (iii) the country in which the firm primarily operates (the country where the firm generates more than 50% of its revenue or has more than 50% of its assets), or (iv) the country of the firm's primary operating subsidiary (Allen and Morse 2013).[c] For example, following Atwood and Lewellen (2019), we would drop a firm that is incorporated in the United States and operates only in the United States. For observations in the Compustat North America database, we classify firm-years with non-missing, non-zero amounts for either foreign tax (TXFO) or foreign pre-tax income (PIFO) as multinational firms. Because Compustat Global does not report PIFO or TXFO, we use geographic segment information from Eikon for all nonhaven firms from the Compustat Global database and we designate these firm-years as multinational if the firms report more than one geographic segment or report revenue outside of the base country for that year. Tax haven firms are multinational by construction since their incorporation and base countries are different. Panel B presents numbers of observations by *HAVEN* and corporate inversion status, rule of law index, *LOWLAW* value, director liability index, and *LOWDIRLIAB* value by base country. Panel C presents numbers of tax haven observations for each base country–tax haven country pair.

TABLE 2
Descriptive statistics

	Full Sample				Tax haven obs. (*HAVEN* = 1)				Nonhaven obs. (*HAVEN* = 0)				Diff in Means	
Variable	N	Mean	Std.	Median	N	Mean	Std. Dev.	Median	N	Mean	Std. Dev.	Median	Diff	t-stat
COE	41,480	0.132	0.077	0.112	2,285	0.156	0.086	0.135	39,195	0.131	0.076	0.110	0.026***	15.64
TAXAVOID	41,480	-0.002	0.040	0.003	2,285	0.005	0.030	0.006	39,195	-0.003	0.041	0.002	0.008***	9.21
TXDIFF	41,480	0.016	0.037	0.006	2,285	0.016	0.025	0.010	39,195	0.016	0.038	0.006	0.000	0.22
TAXRISK	29,865	0.016	0.028	0.007	1,875	0.017	0.022	0.010	27,990	0.016	0.028	0.007	0.001	1.19
SIZE	41,480	6.887	1.709	6.778	2,285	6.867	1.504	6.733	39,195	6.888	1.720	6.781	-0.021	-0.56
EBITDA	41,480	0.140	0.135	0.134	2,285	0.144	0.122	0.129	39,195	0.140	0.135	0.134	0.004	1.45
σEBITDA	41,480	0.055	0.119	0.031	2,285	0.066	0.088	0.038	39,195	0.055	0.121	0.031	0.011***	4.36
LEV	41,480	0.396	0.224	0.398	2,285	0.368	0.178	0.363	39,195	0.398	0.226	0.401	-0.029***	-6.06
BTM	41,480	0.637	0.821	0.454	2,285	0.975	1.507	0.530	39,195	0.617	0.757	0.451	0.357***	20.34
AFOL	41,480	1.927	0.793	1.946	2,285	1.759	0.822	1.792	39,195	1.936	0.790	1.946	-0.177***	-10.41
RET	41,480	0.225	0.672	0.123	2,285	0.329	0.881	0.150	39,195	0.219	0.657	0.122	0.110***	7.59
σRET	41,480	0.117	0.059	0.103	2,285	0.132	0.060	0.119	39,195	0.116	0.059	0.102	0.016***	12.42
BIAS	41,480	0.023	0.117	0.003	2,285	0.030	0.158	0.007	39,195	0.022	0.114	0.003	0.007***	2.87

Notes: This table presents the number of observations, mean, standard deviation, and median of each variable for the full sample and separately by tax haven classification. The difference in means columns present raw differences in means and *t*-statistics from tests of the differences in means for the *HAVEN* = 1 sample versus the *HAVEN* = 0 sample. *** indicates statistically significant mean differences at the level of 0.01.

TABLE 3
OLS regressions of the cost of equity capital on tax haven incorporation

	Pred.	(1) All firm-years		(2) US Based Firm-Years Only		(3) Non-US firm-years excluding China		(4) Chinese firm-years only	
Variable	Sign	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
HAVEN	+	0.0219***	9.59	0.0072**	1.87	0.0195***	3.58	0.0257***	8.75
TAXAVOID	-	-0.1699***	-8.83	-0.1943***	-7.46	-0.1516***	-5.01	-0.3131***	-2.42
TXDIFF	+	0.2353***	10.36	0.2069***	6.93	0.2403***	6.90	0.5348***	3.01
SIZE	-	-0.0046***	-10.84	-0.0041***	-6.12	-0.0054***	-8.60	-0.0021**	-1.81
EBITDA	-	-0.0900***	-11.83	-0.0702***	-6.12	-0.1215***	-16.02	-0.0350**	-2.24
σEBITDA	+	0.0173***	2.72	0.0035	0.61	0.0407***	5.15	0.0846***	3.88
LEV	+	0.0338***	13.07	0.0531***	12.44	0.0210***	6.52	0.0349***	4.47
BTM	+	0.0168***	10.95	0.0331***	9.75	0.0158***	7.22	0.0111***	7.66
AFOL	-	-0.0063***	-7.96	-0.0033***	-2.90	-0.0073***	-5.74	-0.0049***	-2.53
RET	-	-0.0117***	-15.82	-0.0104***	-9.30	-0.0121***	-10.17	-0.0084***	-5.45
σRET	+	0.2681***	23.76	0.2714***	15.05	0.2837***	17.01	0.1758***	6.77
BIAS	+	0.0713***	7.81	0.0306*	1.62	0.0848***	7.64	0.0408**	2.09
Constant		0.1635***	7.90	0.1220***	17.58	0.1873***	5.70	0.1168***	2.74
Year indicators		Yes		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes		Yes	
Country indicators		Yes		No		Yes		No	
N		41,480		18,386		18,166		4,928	
Adjusted R^2		0.374		0.413		0.397		0.252	

Notes: This table presents the results of OLS regressions of the cost of equity (*COE*) capital on tax haven incorporation (*HAVEN*), control variables, and industry, and year fixed effects. Columns (1) and (3) also include base country fixed effects. *, **, *** indicate one-tailed statistical significance at levels of 0.10, 0.05, and 0.01, respectively, following our predictions. Standard errors are clustered by firm. Variables are defined in the Appendix.

TABLE 4

The differential association between the cost of equity capital and tax haven incorporation as tax risk, information risk, and legal risk increases

Panel A: Individual hypothesis tests

		(1)		(2)		(3)		(4)	
	Pred.	*COE*		*COE*		*COE*		*COE*	
Variable	Sign	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
HAVEN	+	0.0182***	6.83	0.0156***	5.17	0.0167***	4.31	0.0148***	3.71
TAXRISK	+	0.0824***	3.59						
HAVEN×TAXRISK	+	0.2274**	1.66						
LOWAFOL	+			0.0067***	7.09				
HAVEN×LOWAFOL	+			0.0105***	2.64				
HAVEN×LOWLAW	+					0.0085**	1.75		
HAVEN×LOWDIRLIAB	+							0.0112**	2.28
TAXAVOID	-	-0.1810***	-7.49	-0.1704***	-8.85	-0.1680***	-8.72	-0.1676***	-8.70
TXDIFF	+	0.2037***	7.07	0.2319***	10.20	0.2369***	10.43	0.2373***	10.45
SIZE	-	-0.0038***	-7.95	-0.0054***	-14.20	-0.0046***	-10.72	-0.0046***	-10.72
EBITDA	-	-0.0969***	-11.64	-0.0915***	-11.96	-0.0902***	-11.83	-0.0903***	-11.84
σEBITDA	+	0.0991***	6.32	0.0169***	2.67	0.0173***	2.71	0.0172***	2.71
LEV	+	0.0472***	14.13	0.0349***	13.57	0.0338***	13.07	0.0338***	13.09
BTM	+	0.0164***	11.21	0.0170***	11.13	0.0167***	10.89	0.0167***	10.89
AFOL	-	-0.0051***	-6.10			-0.0063***	-8.03	-0.0064***	-8.05
RET	-	-0.0115***	-13.26	-0.0116***	-15.73	-0.0118***	-15.85	-0.0118***	-15.86
σRET	+	0.2634***	19.16	0.2645***	23.61	0.2680***	23.79	0.2679***	23.79
BIAS	+	0.0631***	5.10	0.0714***	7.84	0.0712***	7.81	0.0713***	7.81
Constant		0.1261***	4.98	0.1548***	7.76	0.1613***	7.88	0.1608***	7.86
Year indicators		Yes		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes		Yes	
Country indicators		Yes		Yes		Yes		Yes	
N		29,865		41,480		41,480		41,480	
Adjusted R^2		0.384		0.373		0.374		0.374	

TABLE 4
The differential association between the cost of equity capital and tax haven incorporation as tax risk, information risk, and legal risk increases

Panel B: Combined hypothesis tests

		(1)		(2)		(3)		(4)	
	Pred.	All firm-years				Non-Chinese firm-years			
Variable	Sign	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
HAVEN	+	0.0096**	2.10	0.0072*	1.54	0.0061*	1.40	0.0043	0.95
TAXRISK	+	0.0803***	3.50	0.0797***	3.47	0.0800***	3.48	0.0797***	3.47
HAVEN×TAXRISK	+	0.2489**	1.77	0.2597**	1.87	0.3321***	2.48	0.3334***	2.51
LOWAFOL	+	0.0059***	5.76	0.0060***	5.83	0.0057***	5.33	0.0057***	5.37
HAVEN×LOWAFOL	+	0.0068*	1.49	0.0060*	1.36	0.0101*	1.51	0.0092*	1.41
HAVEN×LOWLAW	+	0.0077*	1.32			-0.0013	0.09		
HAVEN×LOWDIRLIAB	+			0.0117**	2.06			0.0139*	1.50
Constant		0.1173***	4.82	0.1163***	4.78	0.1165***	4.78	0.1088***	4.59
Controls		Included		Included		Included		Included	
Year indicators		Yes		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes		Yes	
Country indicators		Yes		Yes		Yes		Yes	
N		29,865		29,865		26,318		26,318	
Adjusted R^2		0.384		0.384		0.406		0.406	

Notes: This table presents the results of OLS regressions of the cost of equity (*COE*) capital on tax haven incorporation (*HAVEN*) and *HAVEN* interacted with variables measuring tax risk (*TAX RISK*), information risk (*LOWAFOL*), and base country-level legal risk *(LOWLAW* and *LOWDIRLIAB*). *LOWLAW* and *LOWDIRLIAB* are excluded from the regressions in columns (3) and (4) of panel A and all columns in panel B, as these variables would be perfectly collinear with the country fixed effects (Hanlon et al. 2015). Panel A includes the interactions individually, and panel B includes all three interactions in the same model. Control variables and base country, industry, and year fixed effects are also included. *, **, *** indicate one-tailed statistical significance at levels of 0.10, 0.05, and 0.01, respectively, following our predictions. Standard errors are clustered by firm. Variables are defined in the Appendix.

TABLE 5
Difference-in-differences tests

Panel A: Difference-in-differences test using corporate inversions

Variable	Pred. Sign	(1) *COE* Coef.	t-stat	(2) *COE* Coef.	t-stat
HAVEN_NONINV	+	0.0224***	9.01	0.0224***	9.00
INVERSIONFIRM	?	-0.0047	-0.63		
INVERSIONFIRM×*POST*	+	0.0222***	2.72		
$INVERSIONFIRM_{t-3\ and\ prior}$	?			-0.0071	-0.86
$INVERSIONFIRM_{t-2}$	?			0.0027	0.23
$INVERSIONFIRM_{t-1}$	?			0.0014	0.14
$INVERSIONFIRM_{t}$	+			0.0241**	1.72
$INVERSIONFIRM_{t+1}$	+			0.0137**	1.89
$INVERSIONFIRM_{t+2}$	+			0.0236***	2.66
$INVERSIONFIRM_{t+3\ and\ after}$	+			0.0149***	2.78
Controls		Yes		Yes	
Year indicators		Yes		Yes	
Industry indicators		Yes		Yes	
Country indicators		Yes		Yes	
N		41,480		41,480	
Adjusted R^2		0.374		0.374	

TABLE 5
Difference-in-differences tests

Panel B: Difference-in-differences test with entropy-balanced subsamples

		(1) Noninversion tax haven firms and control firms		(2) Inversion firms and control firms		(3) Inversion firms only (pre and post)	
Variable	Pred. Sign	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
HAVEN	+	0.0206***	6.90				
INVERSIONFIRM	?			-0.0050	-0.83		
POST	+					0.0179**	2.18
*INVERSIONFIRM*POST*	+			0.0207***	2.96		
TAXAVOID	−	-0.2885***	-4.67	-0.3257***	-4.79	-0.2131*	-1.45
TXDIFF	+	0.3428***	4.00	0.3212***	2.55	-0.1377	-0.77
SIZE	−	-0.0061***	-5.92	-0.0029*	-1.30	-0.0054	-1.13
EBITDA	−	-0.0850***	-7.52	-0.0686***	-3.40	-0.1269**	-2.36
σEBITDA	+	0.0645***	3.58	0.0348*	1.64	0.1477**	1.88
LEV	+	0.0463***	5.99	0.0411***	3.18	-0.0245	-0.79
BTM	+	0.0141***	9.31	0.0055	1.01	-0.0018	-0.41
AFOL	−	-0.0061***	-3.40	-0.0114***	-3.09	-0.0029	-0.39
RET	−	-0.0099***	-7.68	-0.0171***	-4.04	-0.0126*	-1.35
σRET	+	0.2448***	10.32	0.3043***	5.76	0.1716**	1.96
BIAS	+	0.0584***	3.33	0.0087	0.26	0.2129**	1.83
Constant		0.1863***	5.54	0.1878***	5.88	0.1813***	5.05
Year indicators		Yes		Yes		No	
Industry indicators		Yes		Yes		No	
Country indicators		Yes		Yes		No	
N		41,049		39,384		431	
Adjusted R^2		0.354		0.379		0.233	

Notes: This table presents the results of OLS regressions of the cost of equity (*COE*) capital on corporate inversion activity. In column (1) of panel A, the main effect of *POST* is subsumed by year fixed effects but is coded as a binary variable equal to one following inversion for inversion firms, and zero otherwise. The difference-in-differences estimator is the interaction term *INVERSIONFIRM*×*POST*. Noninverting firms with tax-haven-incorporated parents are identified by *HAVEN_NONINV*. Column (2) presents the parallel trends analysis. Panel B analyzes the post-inversion effect using three different subsamples. Column (1) includes noninversion tax haven firms (*HAVEN_NONINV*) and control (nonhaven) firms. Column (2) includes inversion firms (*INVERSIONFIRM*) and control (nonhaven firms). *POST* is subsumed by year fixed effects in column (2). Column (3) includes only inversion firms (*INVERSIONFIRM* = 1) so the main effect of *INVERSIONFIRM* is subsumed by the intercept. Base country, industry, and year fixed effects are also included in columns (1) and (2), but not in column (3). *, **, *** indicate one-tailed statistical significance at levels of 0.10, 0.05, and 0.01, respectively, following our predictions. Standard errors are clustered by firm. All variables are defined in the Appendix.

TABLE 6
Additional tests linking tax haven incorporation to tax risk

Panel A: Comparison of tax-motivated income shifting between tax haven and nonhaven firms

		(1) Base countries with ≥ 10 obs *AvgFROS*		(2) US-based firms only *AvgFROS*	
Variable	Pred. Sign	Coef.	t-stat	Coef.	t-stat
AvgROS	+	0.5739***	12.59	0.5862***	12.18
HighAvgFTR	?	-0.0190***	-3.62	-0.0201***	-3.46
LowAvgFTR×*AvgFTR*	−	-0.0859***	-2.67	-0.0993**	-2.58
HighAvgFTR×*AvgFTR*	−	-0.0297***	-7.28	-0.0284***	-7.05
HAVEN	?	-0.0432	-1.04	-0.0298	-0.72
AvgROS×*HAVEN*	?	-0.0062	-0.03	-0.0355	-0.14
HighAvgFTR×*HAVEN*	?	-0.0070	-0.19	-0.0203	-0.51
LowAvgFTR×*AvgFTR*×*HAVEN*	−	-0.3803**	-2.07	-0.3256*	-1.87
HighAvgFTR×*AvgFTR*×*HAVEN*	?	0.0659***	2.82	0.0627***	2.75
Constant		-0.0013	-0.06	0.0362***	2.87
Year indicators		Yes		Yes	
Industry indicators		Yes		Yes	
Country indicators		Yes		n/a	
N		5,975		5,603	
N (*HAVEN* = 1)		103		86	
Adjusted R^2		0.368		0.378	

TABLE 6
Additional tests linking tax haven incorporation to tax risk

Panel B: Comparison of UTBs between tax haven and nonhaven firms

	HAVEN = 1		*HAVEN* = 0			Test of Differences	
	N	Mean	N	Mean	Mean diff.	Pred. sign	t-stat
CYUTBINC	253	0.2339	6,655	0.1879	0.046**	+	1.97
UTBPEN_IS	174	0.0546	3,895	0.0353	0.019**	+	2.30
UTBPEN_BS	183	0.2833	5,441	0.1907	0.093***	+	6.02

TABLE 6
Additional tests linking tax haven incorporation to tax risk

Panel C: The differential association between the cost of equity capital and tax haven incorporation as tax risk increases using ex ante proxies for tax risk based on income mobility

		(1)		(2)		(3)	
	Pred.	*COE*		*COE*		*COE*	
Variable	Sign	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
HAVEN	+	0.0208***	8.36	0.0207***	8.67	0.0204***	7.59
RD	+	0.0102	1.13				
*HAVEN*RD*	+	0.0490*	1.44				
RDDIFF	+			0.0125*	1.37		
*HAVEN*RDDIFF*	+			0.0711**	2.06		
*HAVEN*MOBIND*	+					0.0059*	1.38
Controls		Yes		Yes		Yes	
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Country indicators		Yes		Yes		Yes	
N		41,480		41,480		41,480	
Adjusted R^2		0.374		0.374		0.374	

Notes: This table presents additional analyses linking tax haven incorporation to tax risk. Panel A compares tax-motivated income shifting between tax haven and nonhaven firms, using the methodology of Klassen and Laplante (2012).Klassen and Laplante (2012) estimate the following model:

$$AvgFROS_{it} = \alpha_0 + \beta_1 AvgRoS_{it} + \beta_2 HighAvgFTR_{it} + \beta_3 LowAvgFTR_{it} \times AvgFTR_{it} + \beta_4 HighAvgFTR_{it} \times AvgFTR_{it} + \Sigma \beta_{5k} Industry_{it} + \Sigma \beta_{6k} Year_{it} \quad (4)$$

We modify this equation by adding an indicator variable for tax haven incorporation (*HAVEN*) and interacting *HAVEN* with each of the variables. A negative coefficient on *LowAvgFTR*×*AvgFTR*×*HAVEN* indicates greater outbound shifting (i.e., out of the base country) by tax haven firms, consistent with our prediction. The sample for this test is all firms with data to estimate the model with at least 10 firm-years in the base country (column (1)) and only US-based firms (column (2)). Base country, industry, and year fixed effects are also included in column (1), and industry and year fixed effects are included in column (2). Panel B presents univariate comparisons of tax risk between tax haven (*HAVEN*) and nonhaven firms using Uncertain Tax Benefit (UTB) disclosures. The sample for this analysis is all firm-years in the primary sample with UTB data in Compustat (available from 2007-2013). Panel C presents the results of OLS regressions of the cost of equity (*COE*) capital on tax haven incorporation (*HAVEN*) and *HAVEN* interacted with three additional proxies for ex ante tax risk based on income mobility. *, **, *** indicate one-tailed statistical significance levels of 0.10, 0.05, and 0.01, respectively, following our predictions. Standard errors are clustered by firm. Variables are defined in the Appendix.

TABLE 7
Alternative Measures of Cost of Capital

Variable	Pred. Sign	(1) *RET* Coef.	t-stat	(2) *σRET* Coef.	t-stat	(3) *COD* Coef.	t-stat
HAVEN	+	0.0596***	3.56	0.0085***	5.09	0.0026**	1.76
TAXAVOID	-	1.9809***	11.51	-0.0929***	-6.39	-0.0754***	-5.06
TXDIFF	+	1.1700***	6.44	0.1108***	6.50	-0.0121	-0.78
SIZE	-	-0.0032*	-1.32	-0.0101***	-31.09	-0.0008***	-2.86
EBITDA	-	0.4896***	9.69	-0.0355***	-10.56	0.0086***	2.71
σEBITDA	+	0.0565**	1.74	0.0633***	5.00	0.0063*	1.40
LEV	+	-0.0469***	-2.93	0.0160***	9.28	-0.0021	-1.27
BTM	+	-0.1050***	-13.07	0.0056***	9.70	-0.0003	-0.94
AFOL	-	-0.0632***	-11.97	0.0062***	10.32	-0.0032***	-6.28
RET	-					0.0010***	2.34
σRET	+					0.0549***	9.78
Constant		0.1380**	1.82	0.1662***	18.86	0.1057***	11.07
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Country indicators		Yes		Yes		Yes	
N		41,480		41,480		32,489	
Adjusted R^2		0.279		0.383		0.173	

Notes: This table presents the results of OLS regressions of alternative proxies for the cost of capital on tax haven incorporation (*HAVEN*), control variables, and base country, industry, and year fixed effects. *t*-statistics are in brackets. *, **, *** indicate two-tailed statistical significance at levels of 0.10, 0.05, and 0.01, respectively, except on *HAVEN*, where statistical testing is one-tailed following our prediction. Standard errors are clustered by firm. Variables are defined in the Appendix.

TABLE 8
Decentering analysis

Variable	Pred Sign	(1) All Firm-Years Coef.	t-stat	(2) Only Decentered Firm-Years Coef.	t-stat
HAVEN	+	0.0223***	7.79	0.0104***	2.66
Decentered Nonhaven	?	0.0090**	2.16		
TAXAVOID	−	-0.1706***	-8.85	-0.3113***	-4.93
TXDIFF	+	0.2341***	10.30	0.1116***	1.44
SIZE	−	-0.0046***	-10.78	-0.0087***	-6.20
EBITDA	−	-0.0900***	-11.84	-0.1064***	-6.00
σEBITDA	+	0.0171***	2.71	0.0291***	3.22
LEV	+	0.0339***	13.11	0.0551***	5.27
BTM	+	0.0167***	10.87	0.0128***	6.10
AFOL	−	-0.0063***	-8.01	-0.0015	-0.52
RET	−	-0.0117***	-15.82	-0.0133***	-7.36
σRET	+	0.2671***	23.68	0.2122***	7.11
BIAS	+	0.0713***	7.82	0.0647***	2.90
Constant		0.1618***	7.79	0.1629***	15.12
Year indicators		Yes		No	
Industry indicators		Yes		No	
Country indicators		Yes		No	
N		41,480		3,821	
Adjusted R^2		0.374		0.3234	

Notes: This table presents the results of OLS regressions of the cost of equity (*COE*) capital on tax haven incorporation (*HAVEN*) and nonhaven decentering (*Decentered Nonhaven*). In column (2) we limit the sample to only decentered firms (i.e., firms that are incorporated or primarily listed in a different country than the base country). Base country, industry, and year fixed effects are included in column (1). **, *** indicate one-tailed statistical significance at levels of 0.05 and 0.01, respectively, following our predictions. Standard errors are clustered by firm. Variables are defined in the Appendix.