Governance and Taxes: Evidence from Regression Discontinuity[*]

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Abstract

We implement a regression discontinuity design to examine the effect of institutional ownership on tax avoidance. We find that positive shocks to institutional ownership around Russell 1000/2000 index reconstitutions lead, on average, to significant decreases in effective tax rates and additional evidence for prioritization of cash over book-tax savings. This shock is also associated with greater use of international tax planning using subsidiaries located in tax havens. These effects are smaller for firms with initially strong governance and high levels of executive equity compensation, suggesting poor governance as an explanation for the undersheltering puzzle. Further, these effects vary across the distribution of effective tax rates, with the largest decreases for firms with the highest effective tax rates, and increases for firms in the bottom quartile of the distribution, consistent with institutional ownership pushing firms towards an optimal level of tax avoidance.

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1 Introduction

How does corporate governance affect tax avoidance? Better corporate governance, for example, through increased institutional ownership, should lead to better alignment of the incentives of managers and shareholders, and so also to a level of tax avoidance that is closer to the optimal choice from the perspective of shareholders. Whether this results in an increase or a decrease in effective tax rates (ETRs) depends on whether the initial level of investment in tax avoidance activities is too high or too low. Weisbach [2002] argues that the significant benefits of using tax shelters combined with the low probability of getting caught yield an 'undersheltering puzzle'. However, the extant empirical literature on this topic, particularly as it concerns corporate governance and tax avoidance, is mixed (Armstrong et al. [2014]).

In this paper, we provide new evidence to this debate using a regression discontinuity approach that compares the tax avoidance behavior of firms just-added to the Russell 2000 index with those just-excluded. The Russell indexes are particularly amenable to a regression discontinuity approach because index inclusion is based on a ranking by market capitalization on May 31 of each year. At that date, the top 1000 firms become members of the Russell 1000, and the following 2000 become members of the Russell 2000. Therefore, close to the threshold, inclusion in each index is quasi-random with respect to corporate policies. As in Crane et al. [2014] and Chang et al. [2015], we find a significant increase in institutional ownership following inclusion in the Russell 2000 index at the Russell 1000/2000 threshold. Notably, Mullins [2014] finds that other blockholders are not displaced by these new institutional owners.[1]

We find that positive shocks to institutional ownership around Russell 2000 index re-

[1] Chang et al. [2015], Crane et al. [2014], and Mullins [2014] find that the discontinuity in institutional ownership around the Russell 1000/2000 index threshold is related to improvements in corporate governance, as demonstrated by changes in CEO performance-sensitive compensation, CEO turnover, capital expenditures, cash and diversifying acquisitions, profitability, and equity prices. Similarly, Bird and Karolyi [2015] show that these increases in institutional ownership are associated with increased quantity and quality of corporate disclosure.

constitutions over the period 1996-2006 lead, on average, to significant decreases in effective tax rates for firms just-added compared to those just-excluded. That is, consistent with Crane et al. [2014], we find that firms just-added to the Russell 2000 index experience a 10% increase in institutional ownership. This exogenous increase in institutional ownership leads to declines in effective tax rates on the order of two percentage points, or 8-12%, relative to those just-excluded, even after including firm fixed effects, year fixed effects, and a broad set of time-varying firm control variables. This corresponds to a $9.35 million decrease in cash taxes paid per year for the average firm in our sample. We observe this change for both book and cash effective tax rates, with evidence for larger effects on the cash rate, consistent with an institutional investor focus on cashflow. Increased institutional ownership appears to lead to such effects both through improvements in monitoring, as proxied by turnover in the board of directors, and through increases in managerial incentives induced by relatively higher option compensation.

To investigate a potential mechanism through which this tax avoidance is accomplished, we also investigate the practice of international tax planning through the use of tax haven subsidiaries. We find that a one percentage point increase in institutional ownership leads to a 2.2% increase in the likelihood of having a subsidiary in at least one tax haven country, a 10.4% increase in the number of subsidiaries in tax havens in total, and a 3.7% increase in the number of distinct tax haven countries in which a firm is active. These results suggest that, on average, institutional investors encourage international tax planning activities. Because firms may be unable to execute new international tax planning initiatives quickly, we investigate the time series properties of the tax haven effect. Consistent with set-up costs, we find evidence that the change in tax haven use and effective tax rates increases over the three years following exogenous changes in institutional ownership.

If these changes to tax avoidance behavior are indeed the result of changes in governance, we would expect the magnitude and the direction of the effects to depend on a firm's pre-index inclusion governance and level of tax avoidance. First, the positive shock to governance should matter most for firms with poor initial governance. We find this to be the case when measuring governance using the Gompers et al. [2003] G-index or the level of executive equity compensation from Execucomp. When allowing for heterogeneity of the effect in both of these measures, we find that high governance and high equity incentives both diminish the change in tax avoidance.

One would also expect to see larger increases in tax avoidance for firms with low initial tax avoidance (high effective tax rates). Allowing the effect of institutional ownership to vary by the quartile of the effective tax rate confirms this intuition. In fact, for firms with the lowest effective tax rates, inclusion in the Russell 2000 index actually results in a relative increase in GAAP tax rates. Particularly when looking at changes in cash effective tax rates, there is a clear monotonicity in effect, with firms in the top quartile of effective tax rates seeing decreases on the order of four percentage points. The preference of institutional investors for cash over GAAP tax expense savings is starkest in the top and bottom quartiles of the effective tax rate distribution. This result is consistent with the survey evidence of Graham et al. [2013] that 84% of responding tax executives said that GAAP ETR was at least as important to them as cash taxes. Hence, larger decreases in cash effective tax rates can be explained by a relatively more severe undersheltering problem as far as cash savings are concerned, as well as the relative importance of cashflow to institutional investors. Importantly, these results cannot be explained solely by mean-reversion in tax avoidance. Because the conditional changes in tax rates we observe are systematically related to index reconstitutions, the degree of mean reversion must be *different* for firms that experience an increase in institutional ownership around index reconstitutions. In fact, this is exactly why we interpret the result as being consistent with the existence of some 'optimal' or desired level of tax avoidance on the part of institutional investors.

These results contribute to our understanding of the determinants of corporate tax avoidance and suggest that improvements in governance lead to more tax avoidance, especially through the use of international tax planning strategies. The cross-sectional results based on differences in ex ante governance and tax avoidance are consistent with institutional ownership pushing firms toward a common level of tax avoidance and suggest that one of the unintended consequences of governance-improving reforms will be some convergence of effective tax rates, and a decline in government tax revenues.

Recent work by Balakrishnan et al. [2014] finds that tax avoidance is associated with increased information asymmetry, as measured, for example, by analyst forecast errors. Further, they find that managers appear to attempt to mitigate this asymmetry by increasing disclosure. In related recent work (Bird and Karolyi [2015]), we find that index reconstitutions are associated with improvements in the quantity and quality of corporate disclosure. Hence, managers affected by this exogenous shock to governance both increase their tax avoidance and apparently improve their disclosure enough to offset any associated information asymmetry.

The extant literature on tax avoidance and governance has so far found conflicting results. Minnick and Noga [2010] find weak evidence that governance is associated with domestic and foreign tax avoidance, while Khurana and Moser [2012] show that higher ownership by long-horizon institutional investors is associated with *decreased* tax avoidance, especially for firms with otherwise poor governance. These results are based on cross-sectional variation in institutional ownership and so rely on strategies, such as instrumental variables, to disentangle the drivers of corporate tax avoidance and institutional ownership. Desai and Dharmapala [2009] approach this issue indirectly, by looking at tax avoidance and firm value. They find that tax avoidance significantly improves firm value only for well governed firms. If one assumes that institutional investors care about maximizing the market value of the firm, then this result is consistent with our finding that improved governance leads to increased tax avoidance, with the largest effects for firms starting out with poor governance.

Desai and Dharmapala [2006] develop a model to understand the effect of equity incentives on tax avoidance. The direct effect is that increasing equity incentives causes managers' incentives to become better aligned with shareholders, leading them to increase cashflow by engaging in tax avoidance. However, rent extraction also falls, and if tax avoidance and rent extraction are complements, say, because of complexity and monitoring problems, then tax avoidance will fall. The net effect can in fact be less tax avoidance where governance is poor, and so the scope for decreased rent extraction is the largest. In fact, this is what Desai and Dharmapala [2006] find empirically–increases in the level of executive equity incentives are significantly associated with decreased tax avoidance, but only for firms with weak governance. In a similar vein, Chen et al. [2010] study tax avoidance at family firms and find that such firms are relatively less tax aggressive; they argue that this is a response to minority shareholder concerns about the complementarity between rent extraction and complex tax avoidance.

Armstrong et al. [2014] highlight the importance of considering differential effects of corporate governance on tax avoidance across the distribution of tax avoidance. They find that governance, as measured by the financial sophistication and independence of the board, has a mitigating effect on extreme levels of tax avoidance, with little effect for firms at the mean or median level of tax avoidance. Our findings, using plausibly exogenous shocks to corporate governance, illustrate a similar pattern of effects.

Analysts are also known to play an important role in corporate governance (Chen, Harford, and Lin [2015]). Chen, Chiu, and Shevlin [2014] show that tax avoidance increases following declines in analyst coverage associated with broker closures and mergers.[2] This effect is particularly strong for weakly governed firms and does not appear to be associated with actual cashflow benefits, suggesting that analysts play a positive role in aligning managers' behavior with shareholders' objectives. The fact that the significant effects in Chen et al. [2014] mainly concern reductions in book tax expense is consistent with the primary focus of analysts on earnings per share, and other book measures, rather than cashflow.

The rest of the paper proceeds as follows: Section 2 describes the data and our empirical strategy, Section 3 presents the results for the effect of index reconstitutions on tax avoidance,

[2] Allen et al. [2014] document similar effects using a related strategy.

Section 4 investigates how this effect varies by initial governance and the nature of executives' equity incentives, Section 5 shows how effects vary by the ex ante distribution of effective tax rates, and Section 6 concludes.

2 Data and Empirical Strategy

2.1 Data

Our empirical methodology depends upon changes in Russell 1000/2000 index membership over time. Two approaches have been used in the literature to identify these index membership lists. First, because the Russell 1000 and 2000 indexes are explicitly determined by market capitalization rank as of the last trading day in May each year, the index memberships can be constructed using CRSP data. Second, Russell provides data for academic use. Because Crane et al. [2014] argue that predicting index inclusion for a fixed sample size can induce a bias from index misclassifications, we use index membership lists for the subset of reconstitutions covered by the Russell-provided data in robustness checks of our main results. Our data on institutional holdings come from Spectrum 13-F filings.

As our main measures of tax avoidance behavior, we use effective tax rates, measured using both book tax expense (*GAAP ETR*) and cash taxes paid (*CASH ETR*), following Dyreng et al. [2010]. The benefits to using these effective tax rate measures are that they are easily observable and salient measures of tax avoidance activity, particularly after including firm fixed effects and a rich set of control variables. The main cost is that these rates are not meaningful for firms with negative pretax income, so that we lose these firms in the main analysis. Such firms have a weaker incentive to engage in tax avoidance activity, since their only potential benefit would be to reduce future tax expenses, which may never actually arrive. Hence, our focus in the baseline results is estimating tax avoidance changes for the majority of firms with positive taxable income.

We also consider measures of a firm's use of tax havens, along three different margins, using the subsidiary disclosure in Exhibit 21 of the annual report, as in Dyreng and Lindsey [2009].[3] The simplest is a dummy variable for any disclosed tax haven subsidiaries, and we also investigate count variables for the distinct number of tax haven subsidiaries, as well as the number of distinct tax haven countries in which at least one subsidiary is located. These variables have the benefit of being generally available even for firms with negative income, mitigating the selection problem associated with the use of effective tax rates, and, in fact, permitting a comparison of the tax avoidance behavior following index reconstitutions across taxable and nontaxable firms. In addition, the tax haven variables can potentially illustrate a mechanism through which a firm's effective tax rate is changed.

Previous literature on the cross-sectional determinants of corporate tax avoidance documents the empirical importance of including a variety of firm level control variables (Hanlon and Heitzman [2010]). To that end, we include log total assets to account for firm size, R&D expense, earnings before income, taxes, depreciation and amortization (EBITDA),[4] advertising expense, selling, general and administrative expense (SG&A), year-over-year change in net sales, capital expenditures, leverage, cash and short-term investments, a dummy variable equal to one if a firm has any foreign income, intangible assets, gross property, plant and equipment and a dummy variable equal to one if the firm has any net operating losses. Except for size, change in sales and the two dummy variables, each of these control variables is scaled by total assets. We also include a measure of earnings quality from Beatty et al. [2010] to account for changes in earnings quality due to the change in institutional ownership because of the presence of earnings in the denominator of the ETR measures. Table 1 shows the summary statistics for our measures of tax avoidance and these control variables for our main estimation sample, discussed below. Our sample covers the period 1996 - 2006 and includes 6,603 unique firms. We end our sample period in 2006 because Russell introduced a policy called "banding", which changed their index assignment methodology in 2007 to

[3]We thank Scott Dyreng for making the subsidiary data available on his website.

[4]We choose to control for EBITDA following Dyreng et al. [2010]; replacing this with pre-tax income yields quantitatively similar results.

reduce switches from one index to another. Banding poses a challenge to our empirical approach in that it may allow two firms that should swap places in their respective indexes to remain in their current indexes if the market capitalization difference is small. In effect, this induces some arbitrary rule in index assignment based on market capitalization differentials, which invalidates our regression discontinuity design.

2.2 Empirical Strategy

Our goal is to estimate the effect of an exogenous shock to institutional ownership on corporate tax avoidance. We rely on the previous literature on Russell 1000 and Russell 2000 membership that provides evidence of a discontinuity in institutional ownership around the index membership thresholds. Russell index membership satisfies the key aspects of a regression discontinuity design because membership is based on the May 31 closing-price implied market capitalization rank. While the market capitalization *rank* discontinuities are public knowledge and consistent through time, the underlying market *capitalization* thresholds are time-varying and depend on the cross-sectional distribution of market capitalization at the end of the May 31 trading day. Firms in the top 1000 ranked market capitalization on that day become members of the Russell 1000 and the subsequent 2000, those ranked between 1001 and 3000, comprise the Russell 2000. Therefore, especially close to these market capitalization rank thresholds, Russell index reconstitutions are quasi-random with respect to corporate disclosure policy.

As in Crane et al. [2014], we estimate the following two stage model:

$$IO_{i,t} = \alpha + \tau D_{i,t} + \textstyle\sum_{j=1}^{k} \delta_j R_{i,t}^j + \sum_{j=1}^{k} \gamma_j D_{i,t} R_{i,t}^j + \beta X_{i,t} + u_i + v_t + \epsilon_{i,t} \quad (1)$$

$$Y_{i,t} = \beta_0 + \beta_1 \widehat{IO}_{i,t} + \beta_2 X_{i,t} + u_i + v_t + \epsilon_{i,t} \quad (2)$$

where u_i and v_t represent firm and year fixed effects, respectively, $D_{i,t}$ is an indicator variable that equals one if firm i is a Russell 2000 index member in year t and zero otherwise, $R_{i,t}$ represents the market capitalization rank of firm i in year t minus 1,000, $IO_{i,t}$ represents the fraction of firm i's shares outstanding owned by institutions in year t, and $Y_{i,t}$ represents different measures of tax avoidance, including GAAP and cash effective tax rates, as well as several measures of tax haven activity. $X_{i,t}$ includes a set of time-varying firm characteristics as controls. We include year fixed effects to remove the possibility that the results are being driven by secular changes in tax avoidance or tax policy and firm fixed effects to mitigate selection on time-invariant, unobservable firm characteristics. The parameter k represents the order of the polynomial chosen to maximize the Bayesian information criterion (BIC) as in Lee and Lemieux [2010]. Note that an increase in tax avoidance following Russell 2000 index inclusion will be seen as $\beta < 0$ when using either effective tax rate as the dependent variable and $\beta > 0$ when using the tax haven measures.

Intuitively, this system of equations ensures that the variation in institutional ownership that we use to identify our coefficient of interest, β_1, comes from Russell index reconstitutions. Because the effect of index reconstitutions on tax policy operates through the institutional ownership channel, we utilize a fuzzy regression discontinuity design. Technically, the change in tax policy happens stochastically with respect to the threshold; an observed change in tax policy around the rank threshold does not happen with certainty, which is the differentiating requirement that a sharp regression discontinuity design would require.

A fuzzy regression discontinuity design requires a two stage least squares design as in equations (1) and (2), which means that we can reinterpret the market capitalization ranks and rank threshold as instrumental variables. Thus, the conditions for instrument validity must be satisfied. We observe relevance in Figure 1, which plots the discontinuity in institutional ownership around the rank threshold of 1000. Firms just to the left of the rank threshold are included in the Russell 1000 and firms just to the right of the threshold are included in the Russell 2000. Beyond the statistical relevance of the the rank threshold, relevance is satisfied because of two institutional features of the Russell indexes. First, approximately twice as much institutional investor money is invested in the Russell 2000 compared to the Russell 1000 (Chang et al. [2015]). Second, Russell indexes are value-weighted, meaning that a firm just-included in the Russell 1000 index will have a much lower index weight than a firm just-excluded from the Russell 1000 index. These two features suggest that the discontinuity in institutional ownership around the May 31 market capitalization rank threshold of 1000 is a result of the Russell index methodology. Valid instruments must also satisfy the exclusion criterion. In our case, exclusion is satisfied because other observables are locally continuous at the rank threshold. That is, inclusion in the Russell 1000 or Russell 2000 will not impact tax policy directly. Rather, its effect on tax policy exists only because of its effect on institutional ownership.

Because the fuzzy regression discontinuity design is appropriate to our setting, the smooth local polynomial plots we present in Figures 2 and 3 are reduced-form in the sense that they abstract away from the change in institutional ownership at the rank threshold. In these figures, we can only interpret the jump in tax rates and tax haven use around the rank threshold as a result of institutional ownership because we also observe the discontinuity in institutional ownership at the rank threshold, which is shown in Figure 1, and because of the aforementioned features of the Russell indexes. These two features suggest that the discontinuity in institutional ownership around the May 31 market capitalization rank threshold of 1000 is a result of Russell index methodology. Note that the two stage empirical strategy employed in our formal tests directly connects the firm-level variation in institutional ownership due to index reconstitutions with changes in tax policy at the same firm.

Table 2 presents estimates of $\tau_{i,t}$ from equation (1) in which $k = 0,\ 1,\ and\, 2$ for simplicity. We rely on Crane et al. [2014] for graphical evidence of the discontinuity in institutional ownership and evidence of a discontinuity in institutional ownership across institution types. Our evidence is consistent with that of Crane et al. [2014] in that we find strong evidence of a discontinuity in institutional ownership around the Russell 1000/2000 threshold. Regardless of k, our estimates of the Russell 2000 inclusion effect on institutional ownership at the Russell 1000/2000 threshold are statistically significant at least at the 5% level. For $k = 2$, the polynomial form chosen by the BIC, we find that firms just-included in the Russell 2000 index have a 9.8% increase in institutional ownership relative to those just-included in the Russell 1000 index.

Russell index membership is closely followed by institutional investors, particularly those who benchmark to one of the Russell indexes. Using the same index reconstitutions, Mullins [2014] reports changes in four types of institutional ownership following index reconstitutions: total institutional ownership, dedicated indexers, quasi-indexers, and transient investors. Among firms just-excluded from the Russell 1000 index, total institutional ownership increases by 10%, while dedicated indexer ownership increases by 4-5%, which implies that quasi indexers and transient investors also increase ownership in these firms. This is not particularly surprising given the prevalence of benchmarking investment performance against indexes, and, in particular, the greater institutional following of the Russell 2000 index relative to the Russell 1000 index, as documented by Chang et al. [2015]. Furthermore, because the Russell indexes are value-weighted, the index weight applied to firms at the top of the Russell 2000 index have a much larger weight in that index than firms at the bottom of the Russell 1000 index (Chang et al. [2015]). Mullins [2014] provides further evidence that other blockholders, including insiders and outsiders, are not displaced by these new institutional owners, which implies that retail investors, the group least likely to exert monitoring effort in governance, are the displaced shareholders.

Moreover, Crane et al. [2014] also document a discontinuity in voting participation at the Russell 1000/2000 index threshold, suggesting that these institutional investors are not simply passive stakeholders from a governance perspective. These results provide causal evidence that Russell 1000 index membership has an economically large impact on institutional ownership and activity. This evidence complements arguments from Azar et al. [2014] and McCahery et al. [2014], which suggest that even small, apparently passive institutions engage in corporate governance. This means that even changes in dedicated indexer ownership are likely to impact corporate policies.

3 Index Reconstitutions and Tax Avoidance

In this section, we investigate how index reconstitutions, and the consequent increase in institutional ownership, affect a firm's level of tax avoidance, as measured by effective tax rates and tax haven use.

3.1 Cash Effective Tax Rate

To start, we investigate tax avoidance using cash effective tax rates because, at least in the long run, what should concern shareholders is the cashflow associated with the firm rather than the reported income. Real tax avoidance, at least in the long run, results in actual tax savings in the sense that it results in less cash paid to the treasury, rather than changes in the timing or re-labeling of income streams based on generally accepted accounting principles (Dyreng et al. [2008]). Further, income tax expense can be used an earnings management device (Dhaliwal et al. [2004]), potentially complicating inference given the possibility of managers manipulating earnings to increase their chance of being included in indexes. For these reasons, we also investigate the effect of index reconstitutions on cash effective tax rates.

Table 3 presents our baseline results and reveals that, on average, at the discontinuity, inclusion in the Russell 2000 index leads to decreases in effective tax rates – firms increase their tax avoidance. Both with and without a set of time-varying firm controls, cash effective tax rates fall significantly for firms firms just added to the index relative to those just excluded. Specifically, for a one percentage point increase in institutional ownership caused by inclusion in the Russell 2000, a firm's cash effective tax rate falls by about 0.3 percentage points, which is significant at the one percent level. Given that switching indexes from the Russell 1000 to the Russell 2000 results, on average, in an increase in institutional ownership of ten percentage points, these tax avoidance effects amount to three percentage points of effective tax rates, or 12% of the mean cash effective tax rate in the sample of 24%. This corresponds to a \$9.35 million decrease in cash taxes paid per year for the average firm in our sample.

In principle, rather than an intended goal of institutional investors, these changes in tax avoidance could be mechanical or indirect consequences of other changes affecting firms around the time of reconstitutions. In fact, the effect remains statistically significant and its magnitude falls by about a third when control variables are included. This means that other changes happening at these firms, which may or may not be directly related to tax strategy, account for part of the effect from (1), but still leave a statistically significant decline. Specifically, this effect declines somewhat to about 0.2 percentage points for a one percentage point increase in institutional ownership when firm-level controls are included, suggesting that other behavioral changes by firms are weakly pushing in the direction of increased tax avoidance as well.

3.2 GAAP Effective Tax Rate

We next turn to book effective tax rates. As with cash rates, we find increases in institutional ownership associated with Russell 2000 index inclusion are associated with decreases in tax rates. However, the magnitude and statistical significance of the changes in GAAP tax rates are lower, with larger standard errors. In the basic specification of column (3), without firm control variables, but including the full set of fixed effects, we can see that an increase in institutional ownership of one percentage point results in a decrease of GAAP effective tax rates of .06 percentage points, which is not statistically significant.

Going from column (3) to column (4), we add a set of time-varying firm control variables to account for other changing drivers of tax avoidance around index reconstitutions. This change increases the magnitude of the decline in GAAP effective tax rates to 0.15 percentage points, which is significant at the 10% level. This implies that other changes at firms around the Russell 2000 inclusion are leading to higher effective tax rates, somewhat masking strategic changes in tax avoidance.

If we compare the results using the GAAP ETR and the cash ETR, we can see that the cash effect is relatively larger in each specification: without controls across columns (1) and (3), and with controls across columns (2) and (4). Without controls, this difference is strongly statistically significant, though the difference becomes marginally insignificant when firm-level controls are included. These results are consistent with institutional investors prioritizing higher cashflow over higher reported income, at least on average, and may also reflect a more severe undersheltering problem for cash rather than book income tax expense. Differential ability to affect cash taxes paid relative to book tax expense may also be relevant, given that there appear to be more strategies which reduce cash taxes paid without affecting book tax expense (such as accelerated depreciation) than the converse. We return to this issue in Section 5.

3.3 Use of Tax Havens

So far, we have shown that index inclusion is associated with significantly lower effective tax rates. We next turn to a possible mechanism through which these reductions are accomplished – international tax planning. Since most international tax planning involves the use of subsidiaries in low tax jurisdictions like tax havens, and subsidiary locations are available from firms' annual reports, we focus on three different measures of firms' presence in tax havens. Table 4 presents the results, with the mean of each tax haven measure in the preceding year included at the bottom of the table for ease of interpretation.

Column (1) shows that a one percentage point increase in institutional ownership causes a 0.34 percentage point increase in the likelihood of a firm having at least one tax haven subsidiary, though this effect falls below conventional significance levels. Including firm controls decreases the effect to 0.22 percentage points, though the larger decline in the standard error means that this result is significant at the 10% level. These results actually understate the magnitude of the effect, since firms which already had a haven subsidiary cannot respond along this margin; an alternative interpretation is that Russell 2000 index inclusion leads 7-10% of firms which did not have a tax haven affiliate to invest in one.

In order to study international tax planning intensity, particularly for the majority of firms in the sample which already made some use of tax havens prior to index inclusion, we also carry out our empirical tests using a count of tax haven subsidiaries and a count of distinct tax haven countries in which the firm is active. Both measures increase following a one percentage point increase in institutional ownership, with the total number of tax haven subsidiaries rising by 1.06 percentage points and the total number of distinct tax haven countries used by 0.38 percentage points. For the average increase in institutional ownership from Russell 2000 inclusion, these magnitudes correspond to a 10.4% increase in the number of tax haven subsidiaries and a 3.7% increase in the number of distinct haven countries used. These results suggest that incremental institutional ownership associated with index inclusion is associated with increased complexity and intensity of international tax planning, even for those firms which were already active in tax havens. In particular, the big change in the number of tax haven countries used suggests a more 'innovative' approach to tax planning, above and beyond just increasing the use of existing strategies.

These results show that at least some of the change in effective tax rates associated with index inclusion can be attributed to increases in tax haven activity. Dyreng and Lindsey [2009] find that having material operations in at least one tax haven country is associated with a 1.5 percentage point lower book effective tax rate. This means that for the 7-10% of firms around the threshold which did not have a tax haven subsidiary pre-inclusion, and added one thereafter, we can explain approximately the whole effective tax rate change through the use of haven tax avoidance strategies. However, we find such a change in effective rate on average across all firms around the threshold, so that such strategies are unlikely to explain the entirety of the effects we find. Of course, it may also be the case that the firms in our sample are particularly able to exploit international tax planning relative to the broad sample in Dyreng and Lindsey [2009].

Beyond highlighting a mechanism through tax avoidance is accomplished, our three tax haven measures also address the possible selection issue related to effective tax rates–that we require positive taxable income in order to calculate such rates. In the preceding results, no such sample requirement was necessary. This shows that even including firms with negative income, and so a possibly mitigated incentive to avoid tax, yields statistically significant effects.[5] It is important to note that these tax haven results may possibly have an alternative explanation-improved disclosure following increases in institutional ownership. To investigate this possibility, we investigate the timing of the effect, where we expect to see some delay in response, if in fact real behavior is changing. Table 5 shows how the effect of institutional ownership varies in the first, second and third years following index reconstitutions for the main effects we have identified so far-cash ETR and use of tax havens. As expected, the increased tax avoidance, according to each measure, increases as time passes, given the greater opportunity to adapt tax strategies to the objectives of institutional owners, though is only statistically significant in a few of the cases.

For several other reasons, we expect that the haven results point to at least some actual change in behavior, even if the subsidiary disclosures are indeed improved following Russell 2000 membership. First, the changes in cash ETRs discussed above must be coming from some real behavioral changes by firms, of which the use of international tax planning is a natural example. Second, international tax planning activity could respond quite quickly by making greater use of existing subsidiaries and structures. Such a response could lift some existing subsidiaries and haven countries to the level of materiality, and so would get disclosed in the years immediately following the firm's change in tax strategy.

3.4 Other Mechanisms and Measures

International tax planning is one mechanism by which firms can change their GAAP and cash effective tax rates, but it is by no means the only potential mechanism. Therefore, in

[5]There is nonetheless some incentive for loss firms to set up tax haven subsidiaries to prepare for future profits and also to engage in more complicated loss shifting strategies, as studied in De Simone et al. [2014]; however, it may be difficult to observe such strategies without more disaggregated data.

this section, we address explanations and robustness by exploring alternative measures of tax aggressiveness previously proposed in the tax literature. We use book-tax differences, or $BTD_{i,t}$, a residual measure of the book-tax gap, or $TS_{i,t}$, and a tax shelter prediction score, or $Shelter_{i,t}$.[6] Additionally, we follow Balakrishnan et al. [2014] by introducing industry-by-year-adjusted measures of GAAP and cash ETRs to account for unobservable time-varying industry forces that may impact tax planning. Wilson [2009] provides evidence that $Shelter_{i,t}$ is significantly associated with actual cases of tax sheltering, and Desai and Dharmapala [2006] argue that their residual measure of the book-tax gap, or $TS_{i,t}$, which is adjusted for total accruals, is a more precise measure of tax sheltering activity than simple book-tax differences. Lastly, we include a measure of cash effective tax rates with operating cash flows in the denominator, rather than book income, because of recent work by Guenther et al. [2014]. They show that cash ETRs can be low either because of tax aggressiveness decreasing the numerator, or the inflation of earnings leading to a higher denominator, and that replacing book income with operating cash flows effectively removes the latter effect.

The results presented in Table 6 are broadly consistent with the effective tax rate and tax haven findings. Firms just-added to the Russell 2000 index become more tax aggressive relative to firms just-excluded, on average. These findings suggest that international tax planning is not the only source of changes in tax rates around index reconstitutions and that the influx of institutional investors impacts both the permanent and temporary components of book-tax differences. Results using the operating cash flow version of the cash ETR are in fact larger relative to their respective means than the regular cash ETR, which is consistent with the results of Bird and Karolyi [2015] that institutional ownership leads to improved earnings quality, and, thus, less earnings manipulation and mechanically higher ETRs. This means that the cash ETR results from Table 3 are, in fact, biased downwards.

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[6] Formally, using Compustat variable codes, we calculate $BTD_{i,t} = \frac{1}{AT_{i,t-1}}\left[PI_{i,t} - \frac{(TXFED_{i,t}+TXFO_{i,t})}{0.35}\right]$. We calculate $TS_{i,t}$ as the residual from a regression of $BTD_{i,t} = \beta_1 TA_{i,t} + \mu_i + \epsilon_{i,t}$, where $TA_{i,t}$ equals total accruals scaled by lagged total assets. Finally, we calculate $Shelter_{i,t} = -4.30 + 6.63BTD - 1.72(\frac{DLTT+DLC}{AT_{t-1}}) + 0.66 \ln AT_{t-1} + 2.26(\frac{PI}{AT_{t-1}}) + 1.62FORINCOME + 1.56(\frac{XRD}{AT_{t-1}})$, where $FORINCOME$ is an indicator variable that equals one if the company has any foreign income.

4 Executive Equity Incentives and Governance

In this section, we investigate whether the effects of index reconstitutions on tax avoidance vary predictably according to a firm's ex ante levels of governance and executive compensation structure, motivated by the findings of Desai and Dharmapala [2006] and Armstrong et al. [2014]. The effect of the positive shock to governance from the increase in institutional ownership following inclusion in the Russell 2000 index should depend on the firm's initial governance position as long as the effect of institutional ownership on governance is nonlinear. If, as expected, the effect is diminishing in the ex ante level of governance, then we should see larger effects on tax avoidance from index inclusion for firms with poor initial governance. Likewise, executive equity incentives should play a similar role in aligning managerial incentives with those of shareholders and so any tax avoidance effects should be diminishing in the level of such incentives. Essentially, the undersheltering identified in Section 3 should be concentrated in firms with poor governance and a lack of equity incentives. To investigate these hypotheses, we interact the effect of Russell 2000 inclusion-induced institutional ownership with dummy variables denoting high initial governance, defined as firms whose Gompers et al. [2003] G-index is below the cross-sectional mean for that year,[7] and high equity incentives, defined as firms whose executive equity compensation is above the cross-sectional mean for that year. We also alternatively measure governance using the ex ante level of institutional ownership since it is this measure of governance which is directly affected in our experiment, and to avoid the address the concern that the G-index is mostly associated with entrenchment rather than aspects of governance having more to do with monitoring and incentive alignment, which might be more closely connected to a firm's tax strategy.

We start by investigating the effect of high equity incentives, to proxy for a high level of incentive alignment, on tax avoidance, as measured by cash effective tax rates, in column

[7]We use the five year moving average of the G-index because it is not available all the way through our sample period, though this variable is quite persistent over time. However, similar results are obtained if drop firm-years for which the G-index is not available.

(1) of Table 7. This shows that the effect of index inclusion for firms with high levels of equity incentives is essentially zero – the entire effect on tax avoidance comes from firms with low levels of equity incentives. In column (2), we instead interact the index inclusion dummy variable with the good governance measure and find a similar result. The change in tax avoidance for firms with good governance is negative but statistically indistinguishable from zero so that the whole increase in tax avoidance in the sample is coming from firms with poor pre-inclusion governance.

Equity compensation and corporate governance can play similar roles in motivating managers, as suggested by the results above, so we include all differential effects at once to investigate how they interact to determine the effect of incremental institutional ownership on tax avoidance. The results of column (3) show that it is mainly poor governance which leads to undersheltering. Put differently, poor equity incentives reduce tax avoidance only when governance is otherwise poor. When governance is good, as measured by either the G-index or institutional ownership, equity incentives no longer have a significant effect on tax avoidance.

Replicating the above three specifications for the GAAP effective tax rate yields similar results – tax avoidance increases following index inclusion for firms with poor governance or below average levels of equity incentives. These results show that the average results from columns (3) and (4) in Table 3 are concealing significant impacts of institutional ownership on book tax avoidance for a large subset of firms.

4.1 How Does Institutional Ownership Affect Tax Avoidance?

In the preceding sections, we documented evidence that exogenous shocks to institutional ownership from Russell index reconstitutions led to economically and statistically significant increases in tax avoidance, as measured by effective tax rates, use of tax havens and book-tax differences. One question that remains is the mechanism whereby these new institutional owners actually affect the tax strategy pursued by the firm. Institutional owners use their influence and votes directly to monitor and, thus, affect these strategies, or indirectly by incentivizing the firm's managers to pursue actions consistent with the objectives of the institutional shareholders. We investigate these two possibilities in Table 8.

The most obvious and observable way for institutional investors to monitor firms is through the board of directors. A change in such monitoring behavior should often be associated with turnover on the board. Hence if increased monitoring is to explain changes in tax avoidance, we would expect to see larger effects on behavior in cases where index reconstitutions are followed by some change in the composition of the board of directors. To identify this turnover without losing any firms from our sample, we make use of firms' 8-K filings (Current Report) to the SEC. Specifically, we code a firm as experiencing board turnover if the firm filed an 8-K including an Item 6, "Resignations of Registrant's Directors", (or Item 5.02 under the new coding system used after 2004), in the year after inclusion in the Russell 2000. In column (1), we interact institutional ownership with this dummy variable and find that the fall in effective tax rates is significantly greater when the composition of the board of directors has changed.

To investigate the incentive mechanism, in column (2) we add an interaction term between institutional ownership and the change in the fair value of option awards to the CEO of firm i between years t and $t-1$, as a percentage of total assets. The coefficient on this interaction term enters negatively and is significant at the 10% level, so that firms where executives got more high-powered equity incentives following the increase in institutional ownership also undertook a greater increase in tax avoidance. Hence it appears that improved governance, in this case measured by increased in institutional ownership, leads to more tax avoidance, as a result of both increased monitoring as well as explicit incentive alignment. However, there is still a negative effect of institutional ownership on the cash effective tax rate in the absence of these particular strategies (as seen by the significantly negative coefficient on uninteracted institutional ownership). This is to be expected, since, for example, monitoring could be increased or improved even under the existing board through interaction between the new shareholders and the board or managers directly.

In column (3) of Table 8, we include interactions of both director turnover and the change in options granted to the CEO. Both effects survive with similar magnitudes, although only the director turnover effect is still significant (at the 10% level), likely because the two mechanisms used by institutional shareholders are closely related, leading to multicollinearity. That is, monitoring of the firm increases through changes to the board of directors and this additional monitoring often coincides in changes to managerial incentives. Note that these regressions also include the level of the director turnover variable as well as the measure of option compensation, which addresses the possibility that changes in option compensation, or the tax treatment thereof, lead to mechanical changes in effective tax rates which could undermine our interpretation of our results.

5 Cross-sectional Variation in Tax Avoidance

The key insight of Armstrong et al. [2014] is that the relationship of governance and tax avoidance varies over the distribution of effective tax rates. Intuitively, governance should have a mitigating effect on extreme levels of tax avoidance in the sense that improved governance should lead to increases in particularly low effective tax rates and decreases in particularly high effective tax rates. Likewise, the magnitude of the change should be largest for extreme tax rates, since it is likely less costly for a firm to adjust its tax rate back towards the mean the more extreme it was to start. In fact, this is what Armstrong et al. [2014] find, though they cannot rule out reverse causality or omitted variables as alternative explanations. In this section, we use our regression discontinuity approach to investigate this heterogeneity. As in Section 4, we allow the effect of index inclusion to vary based on the quartile of the firm's pre-reconstitution year effective tax rate.

The first two columns of Table 9 implement this strategy for the cash ETR. Strikingly, the effect of increases in institutional ownership from index inclusion on the tax rate for firms with the lowest ETRs (i.e. highest level of tax avoidance) turns positive. These are the firms which are most likely to be overinvesting in tax avoidance, so that new institutional owners will cause a shift in strategy towards less tax avoidance. That the effect switches signs for firms with the lowest effective tax rates is reassuring, because it seems plausible, given anecdotal evidence on the use of tax shelters, that at least some firms are actually below their optimal tax rate because of aggressive tax planning. The effects for the other three quartiles are monotonically decreasing, reaching statistically significant declines for the third and fourth quartiles.

Turning to the GAAP ETR in columns (3) and (4), we find a similar monotonicity of results, with a significantly significant increase in the rate in the bottom quartile leading monotonically to a large decrease in the rate for the top quartile, of almost three percentage points on average for a firm just included in the Russell 2000 index. Overall, these results, combined with those of Section 4, suggest that institutional ownership compresses the cross-sectional distribution of tax rates, pushing firms toward their 'optimal' tax rate. Importantly, these results cannot be explained solely by mean-reversion in tax avoidance. Because the conditional changes in tax rates we observe are systematically related to index reconstitutions, the degree of mean reversion must be *different* for firms that experience an increase in institutional ownership around index reconstitutions. In fact, this is exactly why we interpret the result as being consistent with the existence of some 'optimal' or desired level of tax avoidance on the part of institutional investors.

Table 3 documented suggestive evidence for a preference by institutional investors for cash over book tax savings, consistent with an institutional focus on cashflow. Comparing the cash and GAAP ETR results in Table 9 provides some additional evidence for this prioritization. In the top quartile, where presumably the incentive of institutional investors to adjust the firm's tax strategy is highest, there are large, statistically significant differences between the two sets of results. Cash ETRs decrease much more for the top quartile relative to the GAAP measure, while this relationship flips for the bottom quartile.

These results fit with the tax haven results from Section 3.3 in the sense that the marginal reduction in effective tax rates from the increased use of tax havens should be highest for firms with the highest initial effective tax rates. Incremental use of tax havens almost certainly leads to cashflow benefits, but only leads to higher reported income if the earnings are designated as permanently reinvested, thus avoiding any deferred tax charge, which is not always the case.

6 Conclusion

In this paper, we study the link between corporate tax avoidance and institutional ownership using a regression discontinuity approach which exploits the quasi-random nature of Russell 1000/2000 index inclusion for firms around the market capitalization threshold. Our main result is that firms just-added to the Russell 2000 index experience declines in effective tax rates and increase their use of tax haven subsidiaries, relative to those just excluded from the index. These increases in tax avoidance are largest for firms with poor ex ante governance and high initial tax rates, which suggests that increases in institutional ownership push firms toward their 'optimal' tax rate, and implicate poor governance as an explanation for the undersheltering puzzle. Institutional investors appear to be particularly concerned with cash effective tax rates, in contrast with managers and analysts. Further, these results imply that improvements in corporate governance will lead to increased tax avoidance, declines in tax revenue and some convergence in effective tax rates.

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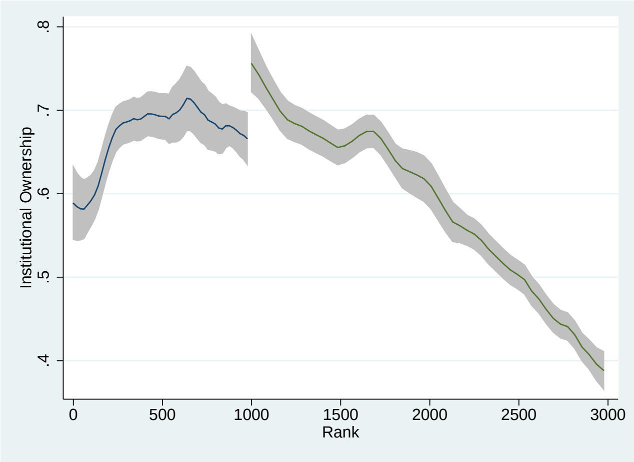

Figure 1. Institutional Ownership over Russell Index Ranks

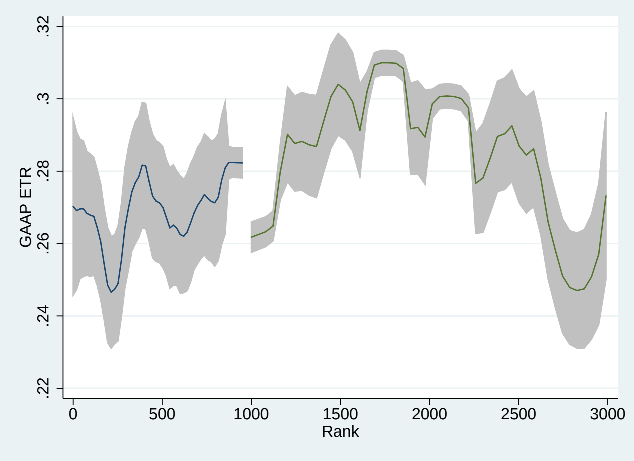

Figure 2a. GAAP ETR over Russell Index Ranks

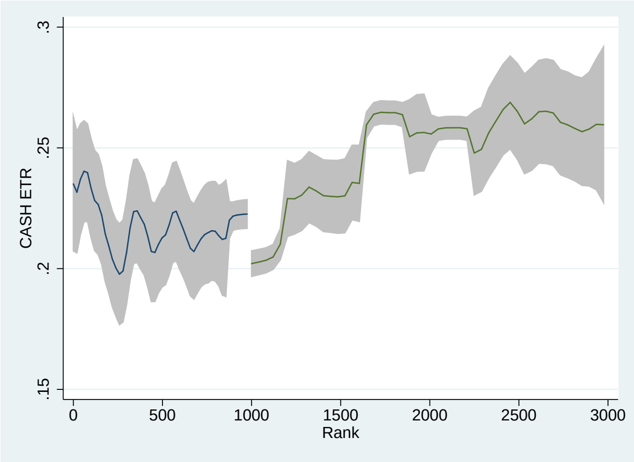

Figure 2b. CASH ETR over Russell Index Ranks

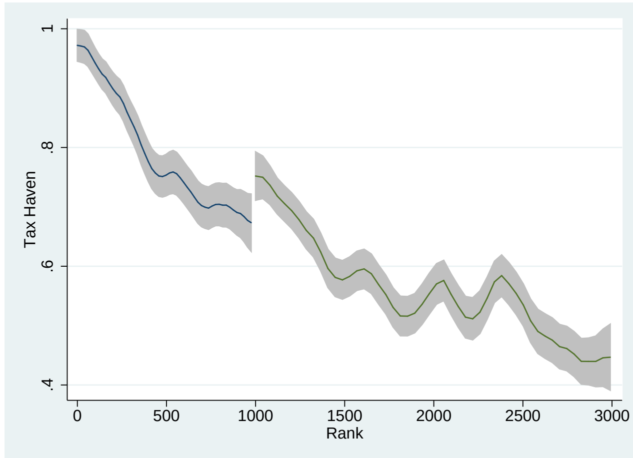

Figure 3a. Tax Haven Presence over Russell Index Ranks

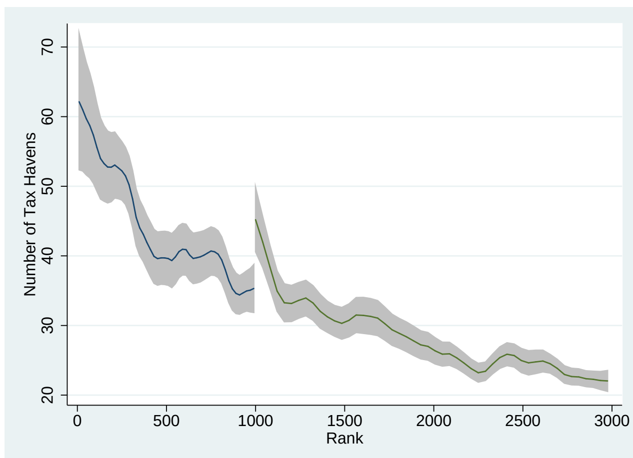

Figure 3b. Tax Haven Subsidiaries over Russell Index Ranks

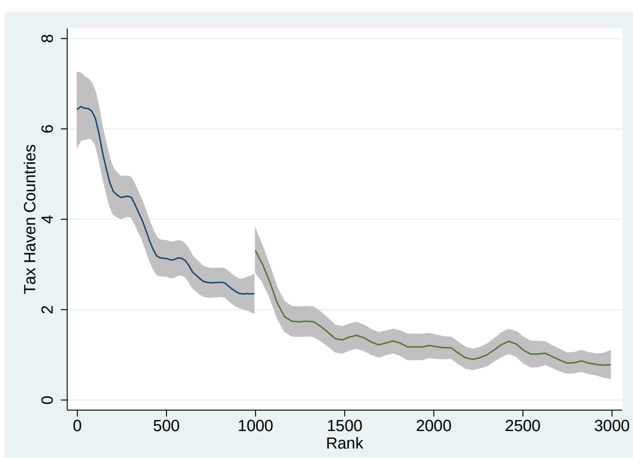

Figure 3c. Haven Country Presence over Russell Index Ranks

Table 1. Summary Statistics

This table provides firm-year level summary statistics for the firms in the Russell 1000 and Russell 2000 indexes between 1996 and 2006. $G\,Index_{i,t}$ is the five-year rolling average of the Gompers et al. [2003] governance index, which takes values between 0 and 24. $Equity\,Compensation_{i,t}$ is the proportion of total CEO compensation awarded in the form of stock or stock options. Executive compensation data come from Execucomp and pertain the the subset of firm that are in both the S&P 1500 and Russell indexes simultaneously. Other firm characteristics are scaled by total assets except for $Size_{i,t}$, which is the $\ln Total\,Assets_{i,t}$, $\Delta Sales_{i,t}$, which is the year-over-year change in net sales, and $AnyForeign_{i,t}$ and $Net\,Operating\,Loss_{i,t}$, which are both indicator variables. $AnyForeign_{i,t}$ equals one if the firm has any foreign income and zero otherwise, and $Net\,Operating\,Loss_{i,t}$ equals one if the firm has any tax loss carryforwards and zero otherwise. $GAAP\,ETR_{i,t}$ and $CASH\,ETR_{i,t}$ are constructed as in Dyreng et al. [2010], and data on tax havens come from Dyreng and Lindsey [2009]. $Tax\,Haven_{i,t}$ is an indicator variable that equals one if firm i has at least one tax haven presence in year t and zero otherwise.

	Mean	SD	25%	Median	75%
Tax Variables:					
$GAAP\,ETR_{i,t}$	27.46%	17.84%	15.28%	30.04%	36.58%
$CASH\,ETR_{i,t}$	23.98%	22.42%	6.62%	20.61%	33.43%
$Tax\,Haven_{i,t}$	61.31%	23.64%	-	-	-
Firm Characteristics:					
$IO_{i,t}$	65.18%	21.64%	48.68%	66.70%	82.37%
$G\,Index_{i,t}$	9.08	2.68	7	9	11
$EquityCompShare_{i,t}$	40.41%	2.28%	38.65%	40.26%	41.73%
$Size_{i,t}$	7.42	0.98	6.46	7.43	8.18
$R\&D_{i,t}$	0.1346	2.0937	0	0	0.0254
$EBITDA_{i,t}$	13.63%	16.08%	6.56%	12.27%	19.64%
$Advertising_{i,t}$	1.06%	2.92%	0	0	0.88%
$SG\&A_{i,t}$	20.96%	18.01%	6.63%	17.84%	31.80%
$\Delta Sales_{i,t}$	0.1988	1.2598	-0.0036	0.0913	0.2361
$CAPEX_{i,t}$	13.08%	10.91%	6.34%	9.72%	16.89%
$Leverage_{i,t}$	23.97%	21.12%	6.54%	21.92%	35.16%
$Cash_{i,t}$	15.42%	17.51%	2.68%	8.56%	22.24%
$Any\,Foreign_{i,t}$	47.71%	49.93%	-	-	-
$Intangible\,Assets_{i,t}$	17.48%	19.44%	1.72%	9.51%	28.31%
$Gross\,PP\&E_{i,t}$	39.87%	28.58%	14.76%	32.92%	64.12%
$Net\,Operating\,Losses_{i,t}$	42.21%	49.36%	-	-	-

Table 2. Institutional Ownership Around the Russell 1000/2000 Threshold

This table provides fixed effects regression estimates of the effect of Russell 2000 index membership on the fraction of shares outstanding owned by institutions, or $IO_{i,t}$, between 1996 and 2006. Specifically, we estimate $IO_{i,t} = \alpha + \tau D_{i,t} + \sum_{j=1}^{k} \delta_j R_{i,t}^j + \sum_{j=1}^{k} \gamma_j D_{i,t} R_{i,t}^j + \beta X_{i,t} + u_i + v_t + \epsilon_{i,t}$ and present estimates in which we vary k, the order of the polynomial. Columns (1) and (2) present estimates for $k = 0$, columns (3) and (4) present estimates for $k = 1$, and columns (5) and (6) present estimates for $k = 2$.

	$IO_{i,t}$					
	$k = 0$		$k = 1$		$k = 2$	
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{i,t}$	0.093**	0.086**	0.112**	0.106***	0.101**	0.098***
	(0.045)	(0.042)	(0.051)	(0.047)	(0.039)	(0.036)
$X_{i,t}$	NO	YES	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
R^2	0.7225	0.7302	0.7378	0.7429	0.7381	0.7432
Observations	22,374					

***,**,* reflect statistical significance at the 1%, 5%, and 10% levels, respectively.
Standard errors are clustered at firm level.

Table 3. Baseline Results

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. $CASH\,ETR_{i,t}$ estimates are presented in columns (1) and (2), and $GAAP\,ETR_{i,t}$ estimates are presented in columns (3) and (4). Both ETR measures are constructed as in Dyreng et al. [2010]. A two sample t-test of difference between column (1) and column (3) has a p-value of 0.0071 and a two sample t-test of difference between column (2) and column (4) has a p-value of 0.1303. The Cragg-Donald Wald F-statistic ranges from 33.21 to 54.73 depending on the specification, but all values exceed the Stock-Yogo weak instrument thresholds. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	CASH ETR		**GAAP ETR**	
	(1)	(2)	(3)	(4)
$\widehat{IO}_{i,t}$	-0.292***	-0.196**	-0.056	-0.148*
	(0.081)	(0.097)	(0.072)	(0.087)
$X_{i,t}$	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R^2	0.6897	0.6966	0.7283	0.7396
Observations	15,214		15,368	

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.
Standard errors are clustered at firm level.

Table 4. Tax Havens as a Mechanism for Tax Avoidance

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. $Tax\, Haven_{i,t}$ is an indicator variable that equals one if firm i has at least one tax haven presence in year t and zero otherwise, and both Haven Subsidiaries and Haven Country Presence are log-transformed. Data on tax havens come from Dyreng and Lindsey [2009]. The Cragg-Donald Wald F-statistic ranges from 25.95 to 58.19 in Panel A and from 18.73 to 42.99 in Panel B, but all values exceed the Stock-Yogo weak instrument thresholds. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	Tax Haven		**Haven Subsidiaries**		**Haven Country Presence**	
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{IO}_{i,t}$	0.338	0.222*	1.168***	1.059***	0.445***	0.381**
	(0.211)	(0.134)	(0.433)	(0.412)	(0.167)	(0.140)
$X_{i,t}$	NO	YES	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
R^2	0.4793	0.4861	0.1025	0.1299	0.1318	0.1513
$E[Y_{i,t-1}]$	67.72%		36.33		2.68	
Observations	22,374					

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Standard errors are clustered at firm level.

Table 5. Robustness: Delayed Tax Haven Use and Tax Rate Effects

This table provides predictive fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates and tax haven use between 1996 and 2006. Columns (1) and (2) present cash and GAAP effective tax rate evidence, and columns (3)-(5) present tax haven evidence as in Table 4. $GAAP\,ETR_{i,t}$ and $CASH\,ETR_{i,t}$ are constructed as in Dyreng et al. [2010]. Data on tax havens come from Dyreng and Lindsey [2009]. The Cragg-Donald Wald F-statistics exceed their Stock-Yogo weak instruments thresholds in all specifications. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	CASH ETR	**Tax Haven**	**Haven Subsidiaries**	**Haven Country Presence**
t	-0.196**	0.222*	1.059***	0.381**
	(0.097)	(0.134)	(0.412)	(0.140)
$t+1$	-0.221**	0.281*	1.937**	0.495**
	(0.106)	(0.152)	(0.802)	(0.236)
$t+2$	-0.315**	0.328**	1.671**	0.628**
	(0.143)	(0.162)	(0.811)	(0.304)

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Standard errors are clustered at firm level.

Table 6. Robustness: Alternative Tax Measures

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. $BTD_{i,t}$ is constructed as in Rego and Wilson [2012], $Shelter_{i,t}$ is constructed as in Wilson [2009], $TS_{i,t}$ is constructed as in Desai and Dharmapala [2008], and $Adj.GAAP\,ETR_{i,t}$ and $Adj.CASH\,ETR_{i,t}$ are adjusted effective tax rates as in Balakrishnan et al. [2014]. The Cragg-Donald Wald F-statistic ranges from 28.09 to 36.27, but all values exceed the Stock-Yogo weak instrument thresholds. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	$BTD_{i,t}$	$Shelter_{i,t}$	$TS_{i,t}$	$Adj.CASH\,ETR_{i,t}$	$Adj.GAAP\,ETR_{i,t}$	$CASH\,ETR\,OCF_{i,t}$
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{IO}_{i,t}$	0.373**	0.415***	0.417**	-0.205**	-0.131	-0.245**
	(0.169)	(0.138)	(0.178)	(0.098)	(0.088)	(0.104)
$X_{i,t}$	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
R^2	0.4579	0.6576	0.4543	0.6973	0.7398	0.7195
Observations	15,214	15,214	15,214	15,214	15,214	13,992

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Standard errors are clustered at firm level.

Table 7. Executive Equity Incentives, Governance, and Tax Avoidance

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. Columns (1)-(3) and columns (4)-(6) present cash and GAAP effective tax rate estimates, respectively. Columns (1) and (4) present evidence on the relationship between CEO equity compensation and effective tax rates, columns (2) and (5) present evidence on the relationship between corporate governance and effective tax rates, and columns (3) and (6) present triple interaction estimates for institutional ownership, CEO equity compensation, and governance. $GAAP\,ETR_{i,t}$ and $CASH\,ETR_{i,t}$ are constructed as in Dyreng et al. [2010]. $Good\,Governance_{i,t}$ is an indicator that equals one if $GIM\,Index_{i,t}$ is below the cross-sectional mean in quarter t and zero otherwise, and $High\,Equity\,Comp_{i,t-1}$ is an indicator that equals one if $Equity\,Compensation_{i,t}$ of the CEO of firm i is above the cross-sectional mean in quarter t and zero otherwise. The Cragg-Donald Wald F-statistic ranges from 22.88 to 26.76. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	CASH ETR				GAAP ETR			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)
$\widehat{IO}_{i,t}$	-0.224***	-0.211***	-0.220**	-0.263***	-0.158**	-0.160**	-0.152**	-0.164**
	(0.070)	(0.073)	(0.090)	(0.082)	(0.071)	(0.074)	(0.073)	(0.078)
$IO_{i,t} \times High\,\widehat{Equity}\,Comp_{i,t-1}$	0.078*			0.054	0.093*			0.074*
	(0.042)			(0.067)	(0.052)			(0.038)
$IO_{i,t} \times Good\,\widehat{Governance}_{i,t-1}$		0.175*		0.119*		0.122*		0.181*
		(0.106)		(0.071)		(0.069)		(0.093)
$IO_{i,t} \times \widehat{High}\,IO_{i,t-1}$			0.154***	0.179***			0.191*	0.142*
			(0.059)	(0.053)			(0.099)	(0.078)
$X_{i,t}$	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.6982	0.6985	0.6993	0.7015	0.7402	0.7404	0.7404	0.7417
Observations	9,956				10,241			

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Standard errors are clustered at firm level.

Table 8. The Governance Mechanism: Executive Turnover and Option Awards

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. Columns (1)-(3) and columns (4)-(6) present cash and GAAP effective tax rate estimates, respectively. Columns (1) and (4) present evidence on the relationship between executive and director turnover and effective tax rates, columns (2) and (5) present evidence on the relationship between changes in option award incentives and effective tax rates, and columns (3) and (6) present triple interaction estimates for institutional ownership, executive and director turnover, and changes in option award incentives. $GAAP\,ETR_{i,t}$ and $CASH\,ETR_{i,t}$ are constructed as in Dyreng et al. [2010]. $Director\,Turnover_{i,t}$ is an indicator that equals one if firm i files an Item 5.02 (Item 6 before 2004) as part of 8-K filings with the SEC in year t and zero otherwise. $\Delta Option\,Awards_{i,t}$ is the change in option awards to the CEO of firm i between years t and *t-1* as a percentage of total assets. The Cragg-Donald Wald F-statistic exceeds the Stock-Yogo weak instruments thresholds in all specifications and the Anderson LM statistic p-values are less than 0.01 in all specifications.

	CASH ETR		
	(1)	(2)	(3)
$\widehat{IO}_{i,t}$	-0.233**	-0.246***	-0.224**
	(0.097)	(0.092)	(0.105)
$IO_{i,t} \times \widehat{Director\,Turnover}_{i,t}$	-0.169**		-0.131*
	(0.078)		(0.076)
$IO_{i,t} \times \Delta \widehat{Option\,Awards}_{i,t}$		-0.305*	-0.217
		(0.182)	(0.155)
$X_{i,t}$	YES	YES	YES
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
R^2	0.7012	0.7007	0.7026
Observations		9,956	

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.
Standard errors are clustered at firm level.

Table 9. Optimal Tax Avoidance: Evidence from Ex Ante Effective Tax Rates

This table provides fixed effects regression estimates of the effect of institutional ownership, instrumented by Russell 2000 index membership, on effective tax rates between 1996 and 2006. Columns (1) and (2) present cash effective tax rate evidence, and columns (3) and (4) present GAAP effective tax rate evidence. $Q1\,ETR_{i,t-1}$, $Q2\,ETR_{i,t-1}$, $Q2\,ETR_{i,t-1}$, and $Q4\,ETR_{i,t-1}$ are indicator variables that equal one if firm i is in quartile 1, 2, 3, or 4, respectively, of the cross-sectional distribution of effective tax rates before each index reconstitution. $GAAP\,ETR_{i,t}$ and $CASH\,ETR_{i,t}$ are constructed as in Dyreng et al. [2010]. The Cragg-Donald Wald F-statistic ranges from 17.12 to 19.49. The Anderson LM statistic p-values are less than 0.01 in all specifications.

	CASH ETR		**GAAP ETR**		T-test p-value
	(1)	(2)	(3)	(4)	(1) vs. (3)
$IO_{i,t} \times \widehat{Q1ETR}_{i,t-1}$	-0.056	0.068	0.241***	0.132*	0.0017***
	(0.072)	(0.094)	(0.061)	(0.068)	
$IO_{i,t} \times \widehat{Q2ETR}_{i,t-1}$	-0.069	0.039	0.072	0.089	0.1188
	(0.066)	(0.072)	(0.062)	(0.090)	
$IO_{i,t} \times \widehat{Q3ETR}_{i,t-1}$	-0.233***	-0.180**	-0.128**	-0.097*	0.2585
	(0.076)	(0.087)	(0.053)	(0.058)	
$IO_{i,t} \times \widehat{Q4ETR}_{i,t-1}$	-0.550***	-0.432***	-0.267***	-0.297***	0.0027***
	(0.078)	(0.086)	(0.053)	(0.065)	
$X_{i,t}$	NO	YES	NO	YES	
Firm FE	YES	YES	YES	YES	
Year FE	YES	YES	YES	YES	
R^2	0.7684	0.7813	0.7323	0.7641	
Observations	15,214		15,368		

***,**,* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Standard errors are clustered at firm level.