What Does Income Mobility Reveal About the Tax Risk-Reward Tradeoff?

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Keywords: *tax avoidance, international tax, income shifting, firm value, cash flows*

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ABSTRACT:

We identify a subset of income mobile firms asserted to achieve greater tax savings with lower incremental risk to assess the overall risk-return relation in the context of tax avoidance. We begin by developing a measure of income mobility, which synthesizes several firm-level characteristics that reflect ex ante opportunities to exploit multi-jurisdictional tax planning. We document that income mobile firms engage in more long-term tax avoidance than non-income mobile firms. Further, investors place a higher value on cash tax savings generated by income mobile firms, consistent with investors viewing income mobile tax avoidance as less risky. We conclude that income mobile firms are able to achieve greater tax avoidance with less risk and use this conclusion to evaluate various proxies for tax risk proxies proposed in the literature. Univariate comparisons reveal that income mobile firms have less volatile cash effective tax rates and retain a greater portion of uncertain tax benefits than non-income mobile firms, but that their tax reserves and coefficients of variation are higher. Multivariate analyses suggest that it is important to also take into account the level of tax avoidance when comparing risk proxies. These findings deepen our understanding of tax risk, as well as of the risk-reward trade-off of tax strategies. Our contributions are constructing a composite measure that more powerfully identifies a subset of firms capable engaging in sustainable tax avoidance than any single component of the measure and providing a more nuanced understanding of tax risk.

Keywords: *tax avoidance, international tax, income shifting, firm value, cash flows*

1. INTRODUCTION

Does greater risk always accompany greater tax avoidance? We define tax risk as the likelihood that benefits claimed will not be sustained in the future, whether because of audit, changes in the law, or operational changes that diminish the benefits of existing tax planning. We examine whether high *levels* of tax avoidance correlate with this definition of risk, consistent with standard expectations of risk-return relations. Because each firm has different opportunities for tax avoidance we expect some firms to sustain high levels of tax avoidance without incurring significant risk. To test this conjecture, we identify a group of income mobile firms whose operations afford them many opportunities for lower-risk tax avoidance. We first confirm that these firms enjoy greater tax savings than non-income mobile firms, as expected. Then, holding the *level* of tax avoidance constant, we find that cash tax savings are more positively associated with firm value for income mobile firms. Assuming market efficiency, these results suggest that income mobile tax avoidance bears less incremental risk. We use this finding to examine how well existing proxies for tax risk capture the risk-return relation in general and for income mobile firms in particular. Our results highlight potential limitations of assuming that high avoidance equates to high risk for all firms and help identify strengths and weaknesses of existing proxies for tax risk.

Standard principal-agent models predict that risk-averse managers require higher expected payoffs if they must assume greater risk.[1] In the context of taxation, we expect that given a menu of available tax planning strategies, risk-averse managers will implement low risk strategies before implementing high risk ones. As the number of strategies implemented increases, the tax savings and the associated risk should both increase. A logical conclusion from

[1] Crocker and Slemrod (2005) explore the added complexity of the principal-agent model in corporate tax avoidance because most penalties for corporate tax avoidance affect the firm and not the manager.

this framework is that greater tax savings incur more tax risk, all else equal. Lisowsky et al. (2013) provide a visual framework depicting effective tax rates (ETR) as capturing all forms of tax avoidance with differing levels of risk and characterize those transactions that lack business purpose (tax shelters) as the riskiest. Some readers could interpret their diagram to suggest that lower ETRs represent a more risky tax posture, all else equal. A critical and often overlooked consideration in using such an assertion in cross-sectional tests, however, is that the menu of available tax planning strategies is *not equal* across firms. Some firms have a greater number of low-risk strategies available to them.

Our effort to better understand the tax risk-return relation is motivated by a claimed counter-example to the theory that high returns imply high risk. Kleinbard (2012) asserts that income mobile firms are well-positioned to:

> …capture tax rents by deflecting high-tax source country pretax returns to very low-tax jurisdictions and… thereby capture a rate of return much higher than world after-tax norms, *without incremental risk* [emphasis added]. (671)

We predict that income mobile firms avoid more tax than other firms on average but, holding the level of tax avoidance constant, income mobile firms incur less tax risk. Income mobile firms have a larger menu of tax avoidance opportunities because they can locate valuable capital (e.g., intangible property and unique processes) throughout the world and benefit from income shifting and deferral of U.S. taxes on foreign income. Additionally, these firms can diversify tax risk by taking advantage of various tax incentives (e.g., R&D incentives) and tax holidays in multiple

jurisdictions.[2] Loss of tax benefits in one jurisdiction therefore has less of an impact on income mobile tax avoidance.

Because capturing income mobility is critical to our cross-sectional comparisons, we construct and validate our proxy before conducting tests of the risk-return relation. We measure income mobility by combining several characteristics associated with opportunities to sustain tax benefits: foreign sales, research and development (R&D) and advertising expenditures, gross profit margins, and high-tech industry membership. Our composite score uses the quintile of each category, following Bentley et al. (2013), plus a bonus for being in a high-tech industry.

Following Collins et al. (1998), we estimate that income mobile firms shift more income to low-tax jurisdictions than other multinational firms in response to U.S.-foreign tax rate differentials. This evidence highlights one mechanism through which income mobile firms can achieve tax savings. We then test our hypothesis that income mobile firms avoid more tax overall. Univariate analysis shows that income mobile firms have 2.9 percent lower Cash ETRs and 3.3 percent lower GAAP ETRs on average. Income mobile firms also report significantly higher permanently reinvested foreign earnings and lower average foreign tax rates. We also find that within each component of our income mobility measure (i.e., firms with substantial R&D), income mobile firms have lower ETRs. This finding provides additional evidence that our composite measure captures tax planning opportunities better than any single component of the measure alone.

[2]Additional types of income mobile tax avoidance include incorporating a subsidiary controlled foreign corporation to manufacture and sell products directly to consumers. For example, China has historically offered a 50 percent reduced tax rate for five years to foreign-owned enterprises that invest in designated locations and preferred industries. Firms with advanced production technology receive additional tax benefits beyond five years. For more detail, see Chan and Mo (2000). Further, although the U.S. took the lead internationally when it implemented the R&D credit in 1981, several other countries have since implemented more favorable incentives, and firms relying solely on U.S. R&D tax incentives are therefore at a disadvantage compared to firms that can benefit from such incentives worldwide.

Next, we examine how investors value income mobile tax avoidance. Adapting existing models that explore the valuation of tax avoidance (e.g., Chyz 2013; Desai and Dharmapala 2009), we test whether the association between firm value and cash tax savings is greater for income mobile firms, controlling for investment opportunities and firm-specific operating risk. We find that the market places a higher value on tax savings when firms are income mobile, all else equal, and infer from these results that the market attributes either greater persistence or less risk to income mobile tax avoidance.[3] Using firm-specific regressions to estimate persistence, we find no difference in the persistence of cash ETRs between income mobile and other firms holding the level of tax avoidance constant. This result suggests that the higher valuation of income mobile tax avoidance stems from perceived lower risk and help further validate Kleinbard's (2012) assertion that income mobile firms achieve less risky tax benefits.

We next consider whether tests using common proxies for tax risk reflect the differential riskiness of income mobile tax avoidance. We use the reserve for uncertain tax positions, the standard deviation of the cash ETR, and the coefficient of variation in the cash ETR as proxies for tax risk. First, we observe that income mobile firms report higher reserves for uncertain tax positions, which is not surprising given that income mobile firms enjoy tax savings in multiple jurisdictions and that the rules of FIN 48 do not permit taxpayers to offset unfavorable expected outcomes in one jurisdiction with favorable outcomes in another. However, in untabulated tests we also find that income mobile firms release a smaller proportion of their reserves in estimated payments to tax authorities in settlement of disputes. Second, we estimate that income mobile

[3] Similar to McGuire et al. (2013), we characterize persistent tax avoidance as reflecting the same level of tax benefits claimed year after year. In contrast, tax risk reflects the possibility that benefits claimed in the current year will be overturned in future years. For example, a firm that engages in no tax planning over time has both perfectly persistent tax avoidance (the level of tax avoidance is consistently zero over time) and zero-risk tax avoidance (if not claiming any tax benefits today, there is no risk that those benefits will be overturned in future years). However, a firm that claims a tax benefit this year may not have the same opportunity for tax avoidance next year (i.e., not persistent) but the benefit claimed may not be overturned in the future (i.e., risky).

firms have lower standard deviations of cash ETRs over rolling five-year periods, suggesting less variance in tax outcomes for income mobile firms. Because income mobile firms have lower cash ETRs on average, they would need to have larger percentage fluctuations in annual cash ETRs to generate the same standard deviation as non-income mobile firms. Finally, we find that the coefficient of variation in the cash ETR (i.e., the five-year standard deviation in cash ETR scaled by the mean) is higher for income mobile firms, but that this is because the numerator is scaled by a *lower* mean cash ETR. This univariate analysis highlights potential shortcomings of existing proxies for tax risk when the level of tax avoidance is not held constant and when the differential effect of FIN 48 for multinational firms is not considered.

Next, we use multivariate analysis to further understand the association between tax avoidance and tax risk, and to test whether that association is different for income mobile firms. Multivariate analysis allows us to hold constant the level of tax avoidance when comparing risk measures between the two groups of firms. We find that tax reserves are increasing in the level of tax avoidance for income mobile firms but not for other firms. As previously noted, FIN 48 rules create excess tax reserves for income mobile firms. Even after controlling for the level of tax avoidance, income mobile firms have smaller standard deviations of cash ETRs than other firms on average, consistent with results from our market tests. However, contrary to standard predictions about the risk-return relation, the standard deviation of cash ETRs is decreasing in tax avoidance, although at a slower rate for income mobile firms. Consistent with standard predictions about the risk-return relation, the coefficient of variation is increasing in tax avoidance for non-income mobile firms overall. Income mobile firms have lower coefficients of variation in the cash ETR holding the level of tax avoidance constant, and the coefficient of variation increases in tax avoidance at a slower rate for income mobile firms. This result is

consistent with income mobile firms having less risky tax avoidance. We conclude that greater risk does not universally accompany greater tax avoidance.

Our study contributes to the literature by using a unique subset of firms with greater opportunities for tax avoidance to provide a careful examination of the tax risk-return relation and proxies for tax risk. We find that some proxies do not support the standard prediction that risk and return are positively correlated when using the one- or five-year cash ETR as the measure of return. We also find that these proxies can be biased by the *level* of tax avoidance, making it necessary to control for the level when comparing risk across groups. Our conclusion that the level of tax avoidance is not always a good proxy for the associated risk is of interest to researchers, policy makers, and financial statement users trying to assess tax risk. Our mixed evidence about the association between tax avoidance and tax risk, using existing proxies for tax risk proposed in the literature, suggests caution as financial statement users and researchers attempt to understand and assess cross-sectional differences in tax risk.

Further, we believe our measure of income mobility will be useful to researchers and policy makers. First, researchers could use our measure to test a broad range of theories with cross-sectional predictions based on the extent of multinational tax planning. For example, ballooning foreign cash balances (e.g., Campbell et al. 2014; Foley et al. 2007; Tomy 2014) can create agency conflicts and governance concerns (e.g., Masulis et al. 2012), lead to inefficient investments abroad (Edwards et al. 2013; Hanlon et al. 2013), complicate corporate structures (Lewellen and Robinson 2013), and impact dividend payout policies and financing decisions (Albring et al. 2011; Foley et al. 2007; Nessa 2014). We expect these issues to be exacerbated for firms with significant tax planning opportunities because they have greater ability to trap cash

abroad. Researchers could use our measure of income mobility to test these cross-sectional predictions.

The measure also allows researchers to identify firms with similar opportunities for tax avoidance based on multiple dimensions of business operations. Importantly, our measure explicitly relies on firm characteristics indicative of its underlying income sources and not on the realized level or variation of tax avoidance. We recommend researchers conducting tests that use tax avoidance or tax risk as explanatory variables consider substituting our measure of income mobility or including it to better distinguish more risky from less risky avoidance in cross-sectional tests. For example, in a recently published study, Brown and Drake (2014) use our measure to test the effects of network ties among firms with similar operations and business strategies. Researchers could also use the measure to study ex post realizations of income shifting on a sample of firms well-positioned to engage in such behavior, thereby shedding light on the cost-benefit trade-offs of these types of tax avoidance.[4]

2. BACKGROUND AND CONCEPTUAL FRAMEWORK

Related Literature

Two lines of research motivate us to re-evaluate the tax risk-return relation and develop a measure of income mobility. The first is the extensive literature in finance and accounting examining the determinants and consequences of corporate income tax avoidance. Recently, this literature also directly addresses tax risk. The second is the literature in accounting and economics that focuses on cross-jurisdictional income shifting. The income shifting literature informs our definition of income mobility.

[4] Working papers by Dyreng and Markle (2014) and Wagener and Watrin (2013) also use our measure of income mobility.

Tax Avoidance and Tax Risk

First, several published and concurrent papers explore the determinants and consequences of corporate income tax avoidance for a broad cross-section of firms. These studies attempt to control for firm-level characteristics that contribute to opportunities for explicit tax minimization such as size (Armstrong et al. 2012; Gupta and Newberry 1997; Manzon and Plesko 2002; Rego 2003; Zimmerman 1983), foreign operations (Collins et al. 1998; Klassen et al. 1993; Mills and Newberry 2004; Rego 2003), leverage (Graham 2000, 1996; Graham and Tucker 2006; Gupta and Newberry 1997; Mills and Newberry 2005; Newberry and Dhaliwal 2001; Wilson 2009) and capital intensity (Gupta and Newberry 1997; Stickney and McGee 1982). This research design assumes that these characteristics adequately identify opportunities for tax planning and uniformly affect tax avoidance across a broad cross-section of firms.

All the literature above essentially addresses level effects – that is, they study cross-sectional differences in tax avoidance. Recent research also addresses the riskiness of tax avoidance. These studies vary in their definitions of tax risk. For example, Shevlin et al. (2013) define tax risk as the probability of audit or managerial rent extraction and Guenther et al. (2013) define tax risk as uncertainty about future tax obligations, including penalties. Because a goal of this study is to provide a framework for examining tax risk, we propose a definition of tax risk that is broad enough to encompass commonalities of the various existing definitions yet specific enough to allow a meaningful discussion: the likelihood that tax benefits will not be sustained in the future, whether because of audit, changes in the law, or operational changes that diminish the benefits of existing tax planning. We note that the McGuire et al. (2013) definition of sustainability as a consistent level of tax avoidance over time is analogous to persistence in this study.

Concurrent research proposes several proxies for tax risk, including the five-year standard deviation of cash ETRs (Guenther et al. 2013), the five-year standard deviation of cash ETRs scaled by the mean cash ETR over that same period (McGuire et al. 2013), a six point score of ex ante tax risk (Neuman et al. 2013), and the FIN 48 reserve (UTB) (e.g., Rego and Wilson 2012). In turn, numerous papers associate various outcomes with their proxy of choice, such as ETR volatility and stock price volatility (Guenther et al. 2013), the coefficient of variation and earnings persistence (McGuire et al. 2013), the UTB and investor valuation (Drake et al. 2014) or the cost of equity capital (Hutchens and Rego 2013), and the level of ETR and cost of debt (Shevlin et al. 2013). However, although these papers also include cross-sectional variables to explain variation in tax risk, they do not yet consider that some types of firms enjoy a larger set of avoidance opportunities. We expect that, holding avoidance constant, firms with more avoidance opportunities incur lower risk.

Developing a measure that captures tax planning opportunities along multiple dimensions based on underlying similarities in business operations and asset structure could (i) provide a powerful subsample in which to examine questions about the determinants and consequences of tax avoidance, (ii) allow for the possibility that some firm characteristics differentially affect tax avoidance opportunities based on a firm's fundamental operations, (iii) identify an ideally informative sub-sample for examining the relative merits of different proxies for tax risk, which could help (iv) update our priors about tax risk and return.

Income shifting and Income Mobility

Increasing globalization and strong tax incentives for U.S. corporations to shift income to lower tax jurisdictions has spurred much research in accounting and economics exploring

outcome-based measures of tax-motivated income shifting.[5] Additionally, some studies attribute recently documented increases in income shifting to changes in the regulatory landscape, financial reporting benefits, or firm appetite for tax risk. However such increases in income shifting could be driven by increased globalization and economic rents for innovation (see e.g., Klassen and Laplante 2012b).

A broad economics literature highlights the difficulty of taxing mobile capital (e.g., Gordon and Nielsen 1997; Slemrod and Wilson 2009; Wilson 1999, 2005). This literature describes income mobile firms as those whose business operations and asset structures allow them locate valuable capital (e.g., intangible property, processes) in low-tax jurisdictions. U.S. multinationals can transfer income from the U.S. to subsidiaries in low-tax jurisdictions to benefit from U.S. deferral of taxes on income earned by a foreign corporation. Foreign multinationals with mobile income can also more successfully shift income out of high-tax territorial countries. A substantial business presence in foreign jurisdictions also affords income mobile firms the chance to exploit other tax incentives that those jurisdictions offer.

Prior literature establishes that successful international income shifting requires more than foreign sales or presence in a low-tax jurisdiction like a tax haven (Desai et al. 2006; Dischinger and Riedel 2011; Krautheim and Schmidt-Eisenlohr 2011). For example, when attempting to identify taxpayers engaged in income shifting, the IRS identifies R&D activity and location, descriptions of patents, trademarks and other intellectual property, geographic and organizational structure, and segmented operational and profitability levels as core business factors that must be analyzed. IRS agents also compare key financial ratios within industries to

[5] See, for example, Collins and Shackelford (1998), Collins et al. (1998), De Simone (2014), Dharmapala and Riedel (2013), Gramlich et al. (2004), Grubert and Mutti (1991), Hines and Rice (1994), Huizinga and Laeven (2008), Klassen et al. (1993), Klassen and Laplante (2012a), Markle (2013). Dyreng and Markle (2014) outline the two approaches most commonly used to estimate income shifting and note the limitations of both.

identify cross-border income shifting. We draw on the academic income shifting literature, tax authority procedures, and our institutional knowledge and combine four fundamental firm-level measures with industry membership to classify firms as "income mobile." Given data limitations, our four firm-level measures are "flow" proxies are designed to capture key characteristics of the firm's asset base and structure.

First, a large global footprint allows firms to locate key components of their operations abroad and lay the foundation for shifting income. The proportion of sales to unrelated foreign customers provides a summary measure of that global footprint. Firms with high foreign sales have both the incentive and the opportunity to structure foreign operations in a way that allows them to serve their global market base while optimizing tax burdens.[6] Thus, although some U.S. multinationals still engage in substantial export sales from the U.S. direct to foreign customers, the modern multinational business structures its supply chain in a tax-efficient way to take advantage of U.S. deferral of taxation on foreign earnings. For example Caterpillar, historically known for its export sales structure, recently made headlines for transferring its international parts distribution division to a wholly-owned Swiss subsidiary to mitigate its worldwide tax burden (McCoy 2014).

Second and third, we include R&D and advertising. Significant R&D and advertising expenditures amplify opportunities for worldwide tax avoidance in several ways. The main benefit is that firms can locate the valuable intellectual property created through R&D and advertising expenditures in low-tax jurisdictions and charge royalties to affiliates for its use. This

[6] We use foreign sales to capture foreign activity for three reasons. First, although decades ago researchers used foreign assets to capture the extent of firms' foreign operations because that measure was not confounded by foreign export sales, foreign assets are not as widely reported as they were in the past. For example, Oler et al. (2007) report that only 19 percent of their sample discloses foreign assets. Second, recent studies that estimate foreign assets (e.g., Campbell et al. 2014) often rely on foreign sales to develop their estimates. Third, we are interested in capturing intellectual property, and any available measure of foreign assets likely understates the value of internally-developed intellectual property.

allows companies to shift gross income to low-tax jurisdictions while allocating expenses to high-tax jurisdictions.[7] Second, many countries provide tax incentives for R&D activities. The economics literature notes that R&D is increasingly mobile to foreign jurisdictions (e.g., Griffith and Bloom 2001, Abramovsky et al. 2008).

Our fourth measure is the gross profit margin. Intellectual property generates excess rents due to patent, trademark and copyright protections. Thus, gross profit margin is an ex post measure of intellectual property. Firms with unique products that generate high gross margins have more flexibility to reduce their global tax burden through strategic transfer pricing because tax authorities have more difficulty obtaining comparable arm's-length prices to challenge the taxpayer.

Finally, industry provides an added indication of income mobility because technological innovations that create intellectual property are more common in certain industries.[8] Thus, we also include membership in high-tech (including pharmaceutical) industries (following Francis and Schipper 1999) as a component of our summary measure. In sum, we classify firms with a high proportion of foreign sales, significant R&D and advertising expenditures, high gross profit margins and those that operate in a high-tech industry as "income mobile." Our contribution is constructing a composite measure that aggregates these proxies to provide a more powerful measure of low-risk, long-term tax avoidance than its component parts, as we predict and test below. Further, we use our measure to provide novel evidence on the tax risk-return relation.

[7] Further, R&D and advertising activities often generate substantial expenses related to administrative support, such as legal costs associated with patent and trademark applications and defense. Firms can provide such administrative services in low-tax jurisdictions and charge fees to affiliates in high-tax jurisdictions with a mark-up.

[8] Dyreng et al. (2008) document low long-run cash ETRs tend to cluster in certain industries. Our measure of income mobility identifies firms with low long-run cash ETRs based on multiple dimensions that include industry.

Hypotheses

We seek a deeper understanding of income mobile tax avoidance, including the level of tax avoidance achieved over the long run, the mechanisms through which income mobile firms generate tax benefits, and the relative riskiness of income mobile tax avoidance. We first validate our conjectures that the characteristics of income mobile firms permit greater opportunities for tax avoidance, and that such firms take advantage of those opportunities. Interestingly, recent empirical work generally finds little evidence that low tax firms have more R&D, advertising, or intangibles (e.g., Dyreng et al. 2008) or that foreign assets and geographic complexity are significant determinants of low ETRs (e.g., Armstrong et al. 2011). Thus, we believe there remains some tension in our prediction, and evidence consistent with this prediction is necessary to proceed to the second stage of exploring the risk-return relation.

Hypothesis 1*: Income mobile firms achieve greater tax avoidance than other firms, all else equal.*

We further examine the assertion that income mobile firms achieve higher levels of tax avoidance without incurring as much risk as other firms. Anecdotally, we know that income mobile firms engage in a wide range of numerous tax positions in a large number of taxing jurisdictions. On the one hand, entering into more tax positions in more jurisdictions could subject these firms to more tax risk relative to non-income mobile firms simply because there are more positions and taxing authorities to challenge tax benefits. On the other hand, by spreading a large amount of potential tax benefit across more tax positions and jurisdictions, income mobile firms can potentially diversify away a significant portion of their tax uncertainty. Additionally, Kleinbard (2012) argues that an economically significant portion of income mobile tax avoidance occurs through perfectly legal means, suggesting that although there may be some

uncertainty in the exact amount of tax benefit ultimately sustained in each tax position, income mobile firms effectively can exploit opportunities for tax savings without incremental risk (Kleinbard 2012). We test this assertion in the alternative form below.

Hypothesis 2: *Income mobile firms incur less tax risk than other firms, holding the level of tax avoidance and all else equal.*

3. MEASURING INCOME MOBILITY

Sample Selection

We begin with all observations in Compustat from 1993 to 2012 with sufficient data to calculate variables required for analysis. Following Dyreng et al. 2008, we eliminate REITs (SIC=6798) and any firm with "LP" or "Partners" in the name to remove from the sample flow-through entities not subject to entity level income tax. We also eliminate all unprofitable firm-years and observations with cash ETRs less than zero or greater than one.[9] The final sample consists of 46,044 firm-year observations representing 7,175 firms. Table 1 describes the sample.

[Insert Table 1 here.]

Sample firms have mean (median) one-year cash ETRs of 26.0 percent (25.8 percent), and mean (median) five-year cash ETRs of 28.9 percent (29.4 percent), consistent with Dyreng et al. (2008). Both of these values are less than the combined U.S. federal and blended state statutory tax rate of approximately 39 percent, suggesting that all sample firms on average engage in income tax avoidance. The mean (median) GAAP ETR is 32.2 (35.0) percent, suggesting that sample firms engage in activities, such as claiming tax credits or designating

[9] This sample screen eliminates observations that obtain a tax refund on book profits as well as firms with tax burdens exceeding 100% of book profits, and is consistent with common selection criteria (Guenther et al. 2013, McGuire et al. 2013). As we discuss in the results section, nearly all our results are robust to restoring loss observations to the sample.

foreign earnings as permanently reinvested, that reduce the GAAP ETR. Finding average cash ETRs that are lower than GAAP ETRs suggests that our sample firms engage in temporary tax avoidance as well as permanent tax avoidance. The median state ETR is 3.7 percent, suggesting some state tax avoidance relative to the blended state statutory rate faced by most U.S. corporations (Gupta et al. 2014). Sample firms report an average foreign ETR of 27.6 percent and permanently reinvested earnings (*PRE*) of $1.9M. These factors reflect the lower statutory tax rates available outside of the U.S. on which U.S. tax is not being accrued.

Our sample firms report reserves for uncertain tax benefits (*TaxReserve)* equal to 0.8 percent of assets, on average. Further, we estimate that 39 cents of each dollar of reserves reported at the end of year *t* is released through settlements in the next three years, which could result in cash payments to taxing authorities.[10] This amount is consistent with the estimates in Robinson et al. (2014).

Constructing a Measure of Income Mobility

Broadly following the methodology of Bentley et al. (2013), we classify firms as income mobile based on quintile rankings of foreign sales, R&D, advertising and profit margin, and membership in a high-tech industry. We begin by ranking all observations by year based on R&D and advertising expense, both scaled by assets. Consistent with prior literature (Core et al. 2003; Demers and Lev 2001), we intend these expenditures to capture firm-level investments in intangible assets that might be insufficiently reflected in book value. We also rank observations by year based on foreign sales as a percent of total sales, and by profit margin. We set missing

[10] As noted in Robinson et al. (2014) the amount reported in the "Settlements" line of the FIN 48 tabular rollforward provides an imperfect estimate of amounts paid to taxing authorities to settle uncertain positions. The language in FIN 48 is somewhat ambiguous and requires companies report amounts "related" to settlements on this line. Therefore, for some firms this line could represent cash payments and for other firms it could represent the entire reserve originally accrued for the settled position and thus exceed the cash payment. It is therefore possible that this amount overstates cash tax payments for some firms.

values of R&D and advertising expense to zero when ranking. We also set missing foreign sales to zero when the firm does not report any foreign pre-tax income.

We partition observations into quintiles based on each of these four dimensions. Observations in the top quintile of each characteristic receive a score of four, observations in the second highest quintile a score of three, and so on such that observations in the bottom quintile receive a score of zero. We sum these scores and then add four if the observation is from a high-tech industry, and zero otherwise. We classify the following three-digit SIC codes as high-tech following prior literature (Core et al. 2003; Francis and Schipper 1999): 283, 357, 360-368, 481, 737, and 873. Thus, each firm-year observation obtains a score ranging from zero to 20, with lower scores representing less income mobility. We then rank all observations by their total score and set *IncomeMobile* to 1 if the observation has a score in the top quintile by year. Once we characterize a firm as income mobile, we set *IncomeMobile* to 1 for all subsequent years.[11]

Characteristics of Income Mobile Firms

Table 2 presents information about the classification of income mobile firms. Approximately 24 percent of the sample is considered income mobile and Panel A provides examples of income mobile and non-income mobile firms. As intended, our measure classifies R&D intensive multinational firms in high-tech industries like HP and Wyeth as income mobile. Non-income mobile firms include brick-and-mortar, domestic firms such as Costco Wholesale and financial institutions such as Wells Fargo.

[11] We adopt this method because it is simple to execute and replicate in future research. It is not clear, however, that an equal weighting of each dimension is appropriate. Therefore, we provide additional evidence that the findings herein are robust to using principal component analysis. See Appendix A for details. Results are qualitatively unchanged if we define *Income Mobile* by classifying firms as income mobile on a yearly basis and to identifying income mobile observations versus income mobile firms by ranking each observation by year or in the pooled sample. Results are robust to defining *IncomeMobile* based on alternative groupings of high-tech and pharmaceutical industries as well as to omitting industry altogether from our measure. Finally, all results remain unchanged if we restore loss observations and/or exclude financial firms from the sample.

[Insert Table 2 here.]

Panel B shows the percentage of observations in each component of income mobility that our measure classifies as income mobile. For example, 78 percent of observations in the top quintile of R&D expense (*High_R&D*) are classified as income mobile. Conversely, Panel C shows the percentage of income mobile observations by component. Only 65 percent of income mobile observations are in the top quintile of R&D expense. We note that 66 percent of the income mobile firms identified by our summary measure come from high-tech industries. Therefore, over one-third of observations that we characterize as income mobile operate in other industries. This descriptive analysis underscores the importance of considering dimensions other than industry membership when constructing a measure of income mobility. Focusing exclusively on high-tech industries would exclude firms like Nike that have a mobile asset base due to their valuable brand and flexibility to structure global operations. It also provides comfort that the characteristics of income mobile firms we present below reflect more than just membership in high-tech industries.

Panel D shows the distribution of income mobile firms by industry using the Fama-French 30 industry groups. The largest percent of income mobile firms (36 percent) comes from the Business Equipment industry group, which includes firms such as AMD, Apple and 3M. Another 17 percent each come from Personal and Business Services (which includes many internet-based companies such as Yahoo, Earthlink and Peoplesoft) and from Healthcare (which includes pharmaceutical firms like Abbott and Wyeth). Additionally, many other income mobile firms come from nearly all of the other Fama-French 30 industries not generally considered to be high-tech. This analysis highlights that our income mobility measure captures firm characteristics other than industry that contribute to opportunities for long-run tax avoidance.

Panel E presents descriptive statistics comparing income mobile firms to the rest of the sample. Although income mobile firms are no smaller than other firms based on each group's mean, median sales and assets are statistically smaller for income mobile firms. By construction, income mobile firms report more R&D, advertising expense and foreign sales, have higher gross profit margins, and are more likely to operate in a high-tech industry ($p<0.001$). These results are robust to alternative sample selection criteria, such as including loss firms and/or excluding financial firms (SIC 6000). [12]

Channels of Income Mobile Tax Avoidance

We assert that income mobile firms have greater opportunities for international tax planning, including income shifting, because of the nature of their business operations and asset structures. Due to the confidentiality of tax returns in the U.S. and the lack of financial statement disclosures about specific tax avoidance activities, it is difficult to validate our assertion that the underlying business operations of income mobile firms facilitate their tax avoidance. However, we can use existing methods to examine whether income mobile firms shift more income from the U.S., a relatively high-tax country, to low-tax foreign jurisdictions relative to other firms, as our theory would suggest. We adapt the research design from Collins et al. (1998) to estimate cross-sectional differences in tax-motivated income shifting and determine whether income mobile firms appear to shift more income from the U.S. to low-tax foreign jurisdictions than other firms, all else equal.[13] Although this test cannot capture shifting between foreign jurisdictions, it should understate tax-motivated income shifting more for income mobile firms.

[12] When discussing robustness to alternative sample selection criteria, we re-rank the alternative sample by the components of income mobility and re-calculate *IncomeMobile* for the alternative sample before re-performing any tests.

[13] We acknowledge that firms have opportunities to shift income among low-tax jurisdictions outside of the U.S. Our estimates of US to foreign income shifting therefore represent a lower bound of the extent to which income mobile firms respond to tax incentives to shift income.

Focusing on the subset of sample firms with the potential to shift income internationally (i.e., observations with non-missing and non-zero foreign sales), we estimate the foreign return on sales (foreign pre-tax income / foreign sales) as a function of the worldwide return on sales, income mobility, and the firm's average foreign tax rate, which is a proxy for tax incentives to shift income. [14]

(1) $FOR\_ROS = \beta_0 + \beta_1 * WW\_ROS + \beta_2 * IncomeMobile + \beta_3 * IncomeMobile * FTR + \beta_4 * Non\_IncomeMobile * FTR + YearFE + \varepsilon$

The interaction between *IncomeMobile* and *FTR* captures the extent to which income mobile firms incrementally shift income in response to tax incentives. We expect β_3 to be positive. Additionally, we expect β_3 to be greater than β_4, suggesting that income mobile firms engage in more tax-motivated income shifting relative to other firms. We acknowledge that this approach tests only for income shifting across the US border; consistent with Collins et al. (1998). Because we only have aggregate foreign financial information, we are unable to test for foreign-to-foreign income shifting activities.

Panel A of Table 3 provides descriptive statistics for variables of interest in this regression. Income mobile firms have pre-tax returns on foreign sales (*FOR_ROS*) that are 1.4 percent higher, on average, than non-income mobile firms. Consistent with Collins et al. (1998), we interpret this result to mean that tax-motivated income shifting dominates the effects of potential implicit taxes in foreign jurisdictions for income mobile firms. Additionally, the difference between the U.S. statutory rate and average foreign tax rate (*FTR*), which captures the

[14] Conducting an analysis of tax-motivated income shifting on the entire sample would bias towards finding that income mobile firms shift more income, because they are more likely to have the opportunity to shift income by construction. We therefore first identify the sub-sample of 12,965 firm-year observations with foreign sales and use the approach in the Constructing a Measure of Income Mobility section to characterize firms in this sub-sample as income mobile. We estimate Equation 1 on this sub-sample. Consistent with Collins et al., we calculate the foreign tax rate (*FTR*) as total foreign taxes (*TXFO* and *TXDO*) scaled by total foreign pre-tax income (*PIFO*).

tax incentive to shift income, is 3.5 percent higher for income mobile firms, consistent with our conjecture that income mobile firms enjoy greater tax incentives worldwide. The combination of higher pre-tax returns on foreign sales and lower foreign tax rates suggests that income mobile firms experience even higher after-tax returns on foreign sales, consistent with the conjecture by Kleinbard (2012). Worldwide returns on sales (*WW_ROS*) are also greater for income mobile firms than non-income mobile firms. The higher *WW_ROS* highlights the need for a multivariate analysis of tax-motivated income shifting, because prior literature documents that worldwide returns are a significant determinant of foreign returns. We therefore estimate the effect of *IncomeMobile* on foreign returns on sales, controlling for worldwide returns on sales.

[Insert Table 3 here.]

Panel B reports the results of this multivariate tax-motivated income shifting analysis. As expected, we find a positive and significant coefficient on the interaction between *IncomeMobile* and *FTR* that is significantly larger than the coefficient on the interaction between *Non_IncomeMobile* and *FTR*. These results suggest that income mobile firms shift more income than other firms. Consistent with prior work, we also find foreign returns on sales are positively associated with worldwide returns on sales, as expected. Unexpectedly, we find that the main effect of income mobility on foreign return on sales is negative. However, we already include worldwide return on sales in the regression, and that positive coefficient will capture some of the higher profitability (both worldwide and foreign) that income mobile firms enjoy. These multivariate tests of income shifting provide substantial evidence that the firms we characterize as income mobile are, on average, able to engage in the types of tax avoidance we intend to capture with our measure. Specifically, our analyses support our conjecture that income mobile

firms have opportunities to significantly minimize worldwide income taxes by structuring global operations to support tax-motivated income shifting strategies.

4. TESTS OF HYPOTHESES

Evidence on the level of income mobile tax avoidance (H1)

Income mobile firms report mean (median) GAAP ETRs that are significantly lower by 3.3 (3.4) percent than those reported by non-income mobile firms. This is consistent with income mobile firms earning a greater percentage of their income in low-tax jurisdictions and designating it as permanently reinvested under APB 23.[15] As further support for this assertion, we document that income mobile firms report median *PRE* of $325M, which is significantly higher than median *PRE* reported by non-income mobile firms of $206M.[16] Finding lower GAAP ETRs is also consistent with income mobile firms being able to take advantage of tax credits and other tax incentives that are permanent in nature.

[Insert Table 4 here.]

Income mobile firms report significantly lower values of one-year and five-year cash ETRs (*CashETR* and *CashETR5*, respectively) than non-income mobile firms. Income mobile firms have five-year cash ETRs that are 2.5 percent lower at the median than other firms. Based on the median value of pre-tax income in our sample ($45M), this represents a savings of approximately $1.1M per firm-year. These tests of average tax avoidance suggest that income mobile firms engage in more short-term and long-term tax avoidance than non-income mobile firms. These results are generally robust to including loss firms and/or excluding financial firms.

[15] All mean and median differences are significant at the one percent level.

[16] Income mobile *PRE* scaled by total assets (*AT)* is likewise significantly larger at both the mean and median at the 1% significance level in untabulated tests. Income mobile firms also have opportunities to repatriate PRE and pay only modest U.S. taxes. For example, Dell, an income mobile firm, recently completed a $7B tax-free repatriation using an international reorganization.

Panel B shows the classification of firms as income mobile or non-income mobile within each component of income mobility. For example, within the 9,206 observations in the highest quintile of *R&D* (*High_R&D),* 78.22% are income mobile. We then compare the one- and five-year cash ETRs of income mobile and non-income mobile firms within each component group. We document in untabulated tests that in all five groups, income mobile firms report significantly lower values of *CashETR* and *CashETR5*. This descriptive analysis illustrates that the summary measure contributes to lower one- and five-year cash ETRs more so than any single component of the measure. Therefore, aggregating these characteristics predicted to be associated with greater tax avoidance identifies a subset of firms that is best able to maximize explicit tax savings.[17] These ETR comparisons reflect the totality of tax planning opportunities for income mobile firms and support our assertion that the combination of the five characteristics we use to classify firms as income mobile contributes to opportunities for more tax avoidance.

Evidence of the Risk-Return Relationship (H2)

Market tests

To test Hypothesis 2, we examine market perceptions of the tax risk associated with income mobile tax avoidance. We follow an extensive line of prior research (e.g., Allayannis and Weston 2001; Chyz 2013; Desai and Dharmapala 2009; Lang and Maffett 2011; Lang and Stulz 1994) and use an approximation of *Tobin's q* as a proxy for firm value. However, we confirm results are robust to measuring firm value as the market value of common equity scaled by the book value of assets and as the market value of equity scaled by book value of equity.[18]

[17] Recent empirical work generally finds little evidence that foreign assets and geographic complexity are significant determinants of low ETRs (e.g., Armstrong et al. 2012).

[18] In contrast, Thomas and Zhang (2013) examine investor reactions to tax surprise and focus on identifying situations in which reported tax expense is more likely to serve a proxy-for-profitability role or a matching role. Because we restrict our sample to profitable firm-years and include controls for growth, we expect cash taxes to more closely represent value lost to tax authorities than an alternative proxy for profitability.

To examine the effect of corporate tax avoidance on firm value, we estimate the following model:

(2) $$Tobin's\ q = \beta_0 + \beta_1 * CashTax + \beta_2 * IncomeMobile + \beta_3 * CashTax * IncomeMobile + \beta_4 * NOL + \beta_5 * R\&D + \beta_6 * Size + \beta_7 * Leverage + \beta_8 * Foreign + \beta_9 * Volatility + IndFE + YearFE + \varepsilon$$

Because income mobile firms have greater values of *Tobin's q* on average, we expect a positive main effect of income mobility (i.e., $\beta_2 > 0$). However, our coefficient of interest is β_3, which estimates the differential effect of cash tax savings on firm value for income mobile firms, incremental to the main effect of income mobility. A significant $\beta_3 > 0$ suggests that investors perceive income mobile tax avoidance to be either more persistent or less risky.

We use cash tax savings as a measure of tax avoidance because it captures a broader range of tax avoidance and is less confounded by financial reporting judgment than accrued tax expense (Hanlon and Heitzman 2010). We then multiply our measures of cash tax savings, *CashETR* and *CashETR5*, by negative one in all regressions so that tax avoidance is increasing in the resulting *CashTax* measures. Because we include year- and industry- fixed effects in all of our regression specifications, β_1 captures the effect of deviations from average industry and year cash ETRs on firm value.

Following prior literature examining firm value, we include controls for size, growth, investment opportunities and risk (e.g., Chyz 2013; Claessens et al. 2002; Desai and Dharmapala 2009; Lang and Maffett 2011). *R&D* captures investment in intangible assets that affect market value but not book value. This variable also captures expected future growth due to investments in intangible assets (Core et al. 2003). We control for firm size using the natural log of sales, and for the extent of foreign operations using the absolute value of foreign pre-tax income to total

pre-tax income. We include stock return volatility, calculated as the annualized standard deviation of monthly stock returns reported in CRSP (*RET*) over 60 months to control for risk. Additionally, we augment the model to include controls for tax planning incentives and opportunities. We include tax net operating loss carryforwards and leverage to control for reduced incentives to engage in tax avoidance (e.g., Graham and Tucker 2006, Manzon and Plesko 2002). Because income mobility is associated with greater growth and investment opportunities, we include additional controls for capital expenditures and historical sales growth (Core et al. 2003). All specifications include industry and year fixed effects and cluster standard errors by firm. All continuous variables are winsorized at one and 99 percent.

Panel A of Table 5 describes the variables used in our market test. Panel B of Table 5 presents results from estimating Equation (2). *CashTax* is positively associated with firm value for non-income mobile firms, consistent with shareholders valuing cash tax savings, on average. We find a statistically significant incremental positive association between *CashETR* and *Tobin's q* for income mobile firms. Because *Tobin's q* reflects firm value relative to cumulative historical book value and one-year *CashETR* is a current measure, we also confirm that results are robust to using *CashETR5* as a measure of tax avoidance. The strength of results using *CashETR5* is that it captures a firm's historical ability to engage in long-term tax avoidance, the benefits of which are ultimately sustained.

[Insert Table 5 here.]

All valuation results are robust to *excluding* industry membership from our measure of income mobility. Thus, we are confident that our measure captures more than just an industry effect. We also substitute for *Tobin's q* other measures of firm value, including the market value of equity scaled by the book value of assets and the market value of equity scaled by book value

of equity with similar results. Finally, results are robust to restoring loss observations to the sample and/or to excluding financial firms from the sample.

Tests of tax persistence

Given that income mobile firms avoid more tax on average than other firms, we use tests of persistence to help interpret our finding that income mobile tax avoidance is more highly valued by market participants after controlling for growth and firm-specific operating risk. Valuation models suggest that an item of income or expense commands a higher valuation when it reflects greater persistence, higher growth, or less risk. To better understand whether the differential valuation of income mobile tax avoidance is attributable to greater persistence and/or lower risk, we evaluate the persistence of income mobile firms' cash ETRs relative to non-income mobile firms.[19]

Following the methodology of Francis and Smith (2005) who re-examine persistence of accruals and cash flows, we estimate firm-specific rolling five-year time-series regressions of $CashETR_{t+1}$ on $CashETR_t$, and calculate the average coefficient on $CashETR_t$ by firm (C*ETRPersistence*). We then estimate *CETRPersistence* as a function of *CashETR*, *IncomeMobility*, and *IncomeMobility*CashETR*. This regression tests whether *CashETR* is more or less persistent for income mobile firms, holding the level of tax avoidance constant. We find that persistence is increasing in the level of *CashETR* but we find no differential persistence in *CashETR* between income mobile firms and other firms. Because we control for growth and firm-specific operating risk, these findings suggest that the *higher* market valuation of income

[19] We can directly measure the persistence of tax avoidance following well-established earnings persistence models. However, because one purpose of our study is to evaluate the construct validity of proxies for tax risk, we use the market valuation tests in conjunction with tests of tax avoidance persistence to shed light on proxies for tax risk.

mobile tax avoidance, holding the level of tax avoidance constant, is not driven by differential persistence but rather by lower risk.[20] Our next tests explore proxies for tax risk further.

Univariate tests of tax risk-return

Table 3 suggests that income mobile firms achieve more short-term and long-term tax avoidance than non-income mobile firms. Consistent with our definition of tax risk, we consider tax avoidance to be less risky if a substantial portion of the benefits claimed in the current period is retained by the firm in future periods. The lower long-term cash ETR provides initial evidence suggesting that the tax benefits of income mobile firms are less risky, on average. We examine how this differential level of tax avoidance correlates with multiple proxies for tax risk.

Panel A of Table 6 reports mean and median tax risk proxies used in prior and concurrent research, partitioning the sample by whether the firm is *IncomeMobile*. First, we use disclosures of the reserve for uncertain tax positions (*TaxReserve*), and find that income mobile firms have significantly *higher* reserves than non-income mobile firms.[21] We further analyze FIN 48 settlement disclosures, following Robinson et al. 2014 to interpret reserve releases from settlements as payments in settlement. This untabulated analysis reveals that on average, income mobile firms pay 35 cents in years *t+1* through *t+3* of every dollar of reserve as of year *t*. In contrast, non-income mobile firms pay 41 cents, and the six cent difference is significant. Thus,

[20] Because adequately controlling for growth is critical to our conclusion that the differential valuation of income mobile tax avoidance is attributable to lower risk, in untabulated analysis, we include controls for projected future growth from I/B/E/S with unchanged results.

[21] Lisowsky et al. (2013) conclude that FIN 48 reserves are the best proxy for tax aggressiveness because it is the only proxy consistently related to tax shelters. Income mobile firms report higher FIN 48 reserves likely because they operate in more jurisdictions than non-income mobile firms. This is not surprising because FIN 48 (ASC 740) does not allow companies to offset positions between jurisdictions. We therefore focus our attention on how these reserves unwind.

it appears that income mobile firms retain a greater portion of their uncertain tax positions than non-income mobile firms. [22]

[Insert Table 6 here.]

We then evaluate the volatility of the cash ETR using two measures proposed by concurrent literature. First, similar to Guenther et al. (2013), we calculate the five-year standard deviation of the cash ETR from year *t-4* through year *t (STD_CETR)* and use this statistic as a proxy for tax risk. We document that income mobile firms have *lower* standard deviations than non-income mobile firms, suggesting less volatile or risky tax avoidance.

Next, we follow McGuire et al. (2013) and calculate the coefficient of variation of the cash ETR (*CV_CETR*) as the five-year standard deviation of the cash ETR ending in year *t* scaled by the average cash ETR during the same period. As a proxy for tax risk, *CV_CETR* assumes that large fluctuations in cash ETRs are consistent with positions taken in one year being reversed in a subsequent year such that larger values are assumed to represent riskier tax avoidance. We document that income mobile firms have *higher* coefficients of variation of the cash ETR. However, because income mobile firms have lower standard deviations of cash ETR, their higher *CV_CETRs* are attributable to their smaller average five-year cash ETRs. For example, an income mobile firm that reports cash ETRs that fluctuate between 28 and 30 percent will have the same standard deviation but a greater coefficient of variation than a non-income mobile firm that does no tax planning and reports cash ETRs that fluctuate between 38 and 40 percent. Therefore, the coefficient of variation is positively correlated with both smooth tax avoidance and little or no tax avoidance.

[22] We obtain similar results when measuring the portion of uncertain tax benefits retained following Drake et al. (2014). Those authors measure retained uncertain tax benefits as the decrease in FIN 48 reserves attributable to statute lapses or changes in facts and circumstances less decreases due to settlements, as a percentage of assets.

Figures 1 to 3 display the relation between tax risk and tax reward by income mobility. In each Figure, the y-axis is increasing in tax risk, as measured by *TaxReserve*, *STD_CETR*, and *CV_CETR*. Similarly, the x-axis is increasing in tax "reward" or *CashTax* as measured by the one-year *CashETR* multiplied by negative one. Results are generally robust to using five-year cash ETRs. Fitting a trend line between the proxies for tax risk and cash ETRs by income mobility provides a more nuanced description of the risk-reward relation. The slope for income mobile firms is not consistently smaller or larger than other firms across the three figures, suggesting that the difference in the risk-return relation between the two groups depends on the underlying level of tax avoidance. The Figures therefore corroborate our observation of a denominator effect when using *CV_CETR* as a proxy for tax risk, emphasize the importance of considering the level of tax avoidance when evaluating tax risk using these proxies, and motivate a multivariate analysis of the risk-reward relation.

In addition to providing more insight into risk-return relation for the two subsets of firms, Figures 1 to 3 also allow us to begin to draw some conclusions about the risk-return relation in general. We observe that lower annual cash ETRs are generally associated with higher *TaxReserves* and higher *CV_CETRs*. This evidence is broadly consistent with lower ETRs equating to more tax risk, on average. However, contrary to standard predictions about the risk-return relation, the standard deviation of cash ETRs is *decreasing* in tax avoidance. However, because the standard deviation is an absolute measure of deviation from the mean, a firm with a lower mean cash ETR would need to have larger annual cash ETR fluctuations in percentage terms relative to its mean cash ETR to generate the same standard deviation as a firm with a higher cash ETR. Nonetheless, the non-standard risk-reward relation of the standard deviation of

the cash ETR is potentially a weakness of this proxy for tax risk, and reinforces the need to jointly consider the level and volatility of tax avoidance.

Multivariate tests of tax risk-return

To examine differences in tax risk across income mobile and non-income mobile firms holding the level of tax avoidance constant, we estimate each tax risk proxy as a function of *CashTax*, *IncomeMobility*, and the interaction between the two. We present these results in Table 6, Panel B. We multiply our measure of cash tax savings, the one-year *CashETR*, by negative one in all regressions so that tax avoidance is increasing in *CashTax*. Consistent with univariate results, we find that income mobile firms have higher FIN 48 reserves than non-income mobile firms, and that these reserves increase more for income mobile firms as tax avoidance increases. However, we find no relation between cash ETRs and *TaxReserves* for non-income mobile firms, consistent with the flat dotted line in Figure 1.

The most intriguing results are for the standard deviation and coefficient of variation. We find that the standard deviation of the ETR *decreases* as tax avoidance *increases* for non-income mobile firms, consistent with the downward sloping lines of Figure 2. This result provides further evidence that the five-year standard deviation of the ETR does not exhibit the hypothesized risk-reward relation in the pooled cross-section of firms. Consistent with expectations, the coefficient of variation increases as tax avoidance increases as shown in Figure 3. The coefficient of variation is generally lower for income mobile firms and increases at a lower rate as tax avoidance increases, relative to non-income mobile firms. All results of this multivariate analysis are robust to additionally controlling for firm risk.

In sum, the risk proxies we test generate conflicting evidence. We find that income mobile firms are able to sustain larger tax benefits over longer horizons than non-income mobile

firms. Despite exhibiting higher FIN 48 reserves, untabulated tests show income mobile firms settle or keep larger portions of the FIN 48 reserve for uncertain tax benefits. The standard deviation of ETR as a proxy for tax risk suggests in both samples that tax risk decreases as tax avoidance increases. Further, although the tax risk proxy put forth by McGuire et al. (2013) is higher for income mobile firms in univariate tests, once the level of tax avoidance is held constant, income mobile firms have lower coefficients of variations relative to non-income mobile firms. These findings are robust to alternative sample selection criteria, such as including loss firms and/or excluding financial firms. We therefore urge researchers to consider both the mean and variance outcomes of tax planning to better understand the risk/reward tradeoff. In this study, we estimate that income mobile firms achieve a five-year cash ETR "benefit" that on average is six percent of the mean five-year cash ETR of non-income mobile firms without incurring additional risk (measured using the standard deviation of five-year cash ETRs).

5. CONCLUSIONS

This study develops a novel measure that identifies a subset of firms that we characterize as income mobile, and then examines the tax characteristics of these firms. Specifically, we are the first to empirically document that income mobile firms achieve greater long-term tax benefits via multi-jurisdictional tax planning (such as income shifting) without incurring additional tax risk. Market tests reveal that investors place a higher value on cash tax savings generated by income mobile firms relative to that generated by other firms. Tests of the persistence of income mobile tax avoidance suggest that the higher valuation of income mobile tax avoidance is more consistent with investors understanding and valuing lower riskiness of the tax avoidance than higher persistence. These firms therefore appear to achieve an off-equilibrium blend of risks and rewards from tax avoidance activities.

Our descriptive analysis illustrates that our composite measure of income mobility more powerfully explains long-term tax avoidance than any single component of the measure. Further, some of these characteristics are not individually well-behaved but in our aggregate measure identify a subset of firms that is best able to maximize explicit tax savings. We believe this parsimonious measure will be useful to researchers and policy makers seeking to identify or analyze a subset of firms that achieve long-term, sustainable tax avoidance.

We also use our income mobility measure to further our understanding of proxies for tax risk and the risk-reward trade-offs of tax avoidance in the pooled sample. Although our analysis contributes to this literature by deepening our understanding of the relative merits and weaknesses of each proxy, it is not the focus of this study to develop an alternative proxy. We therefore leave it to future research to improve upon the proxies for tax risk available to researchers, policy makers, analysts, and market participants.

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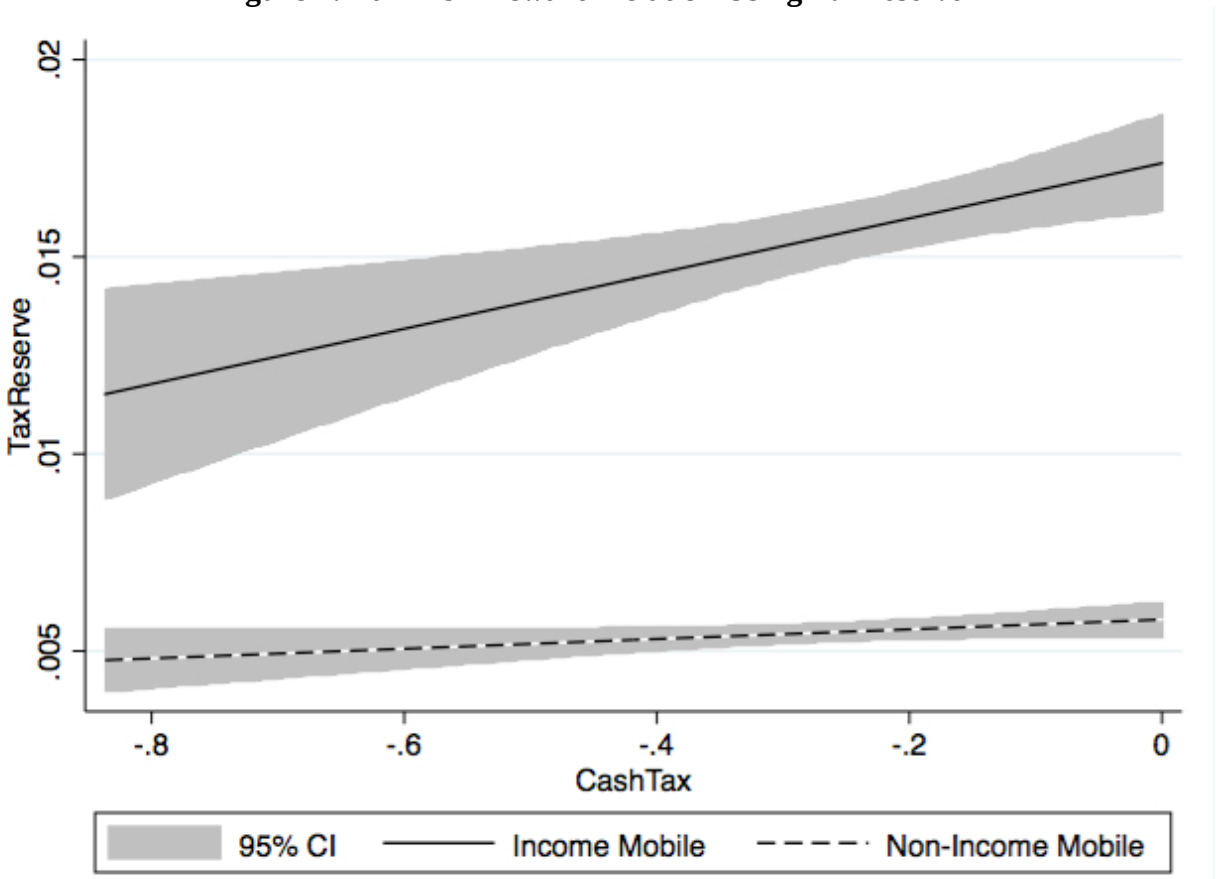
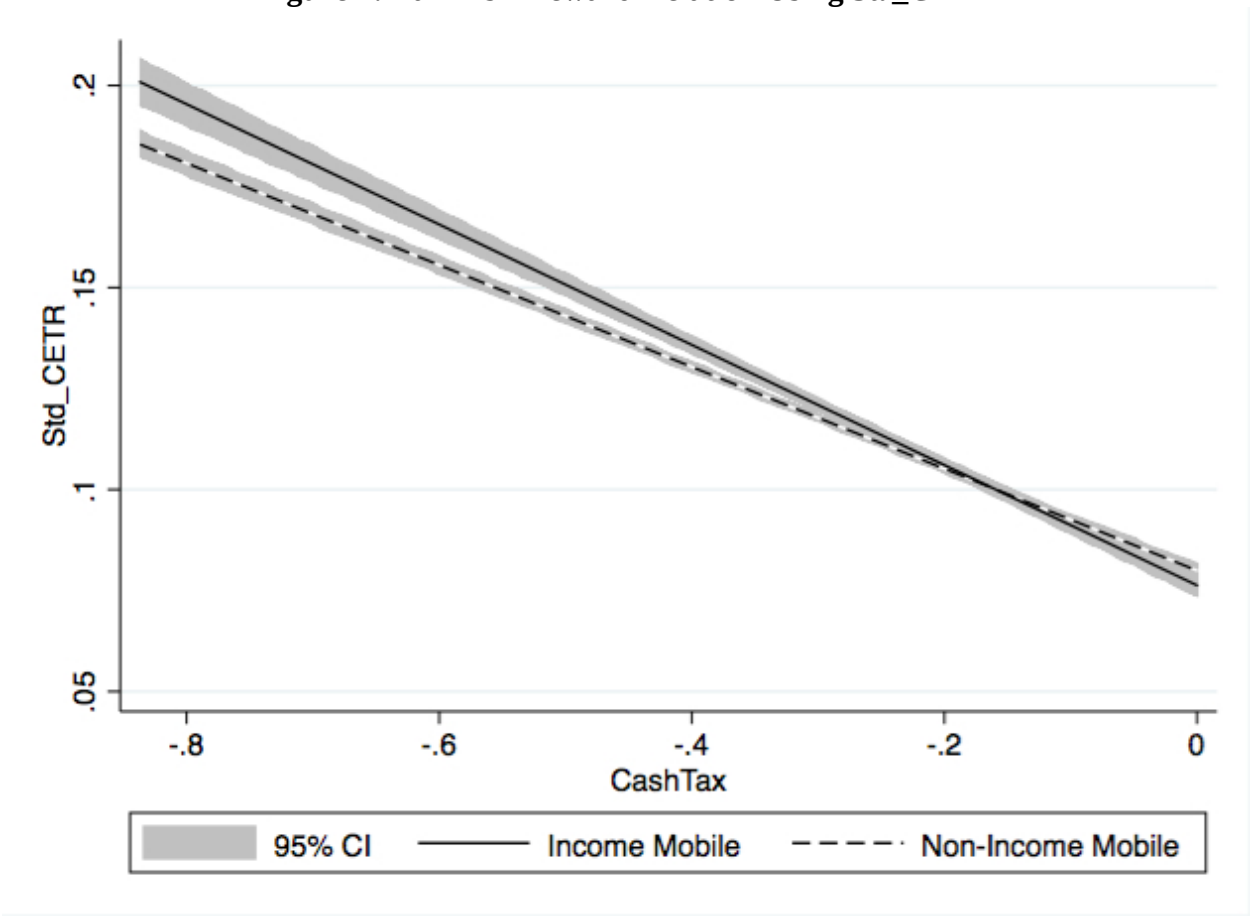
Figure 1: Tax Risk-Reward Relation Using *TaxReserve*



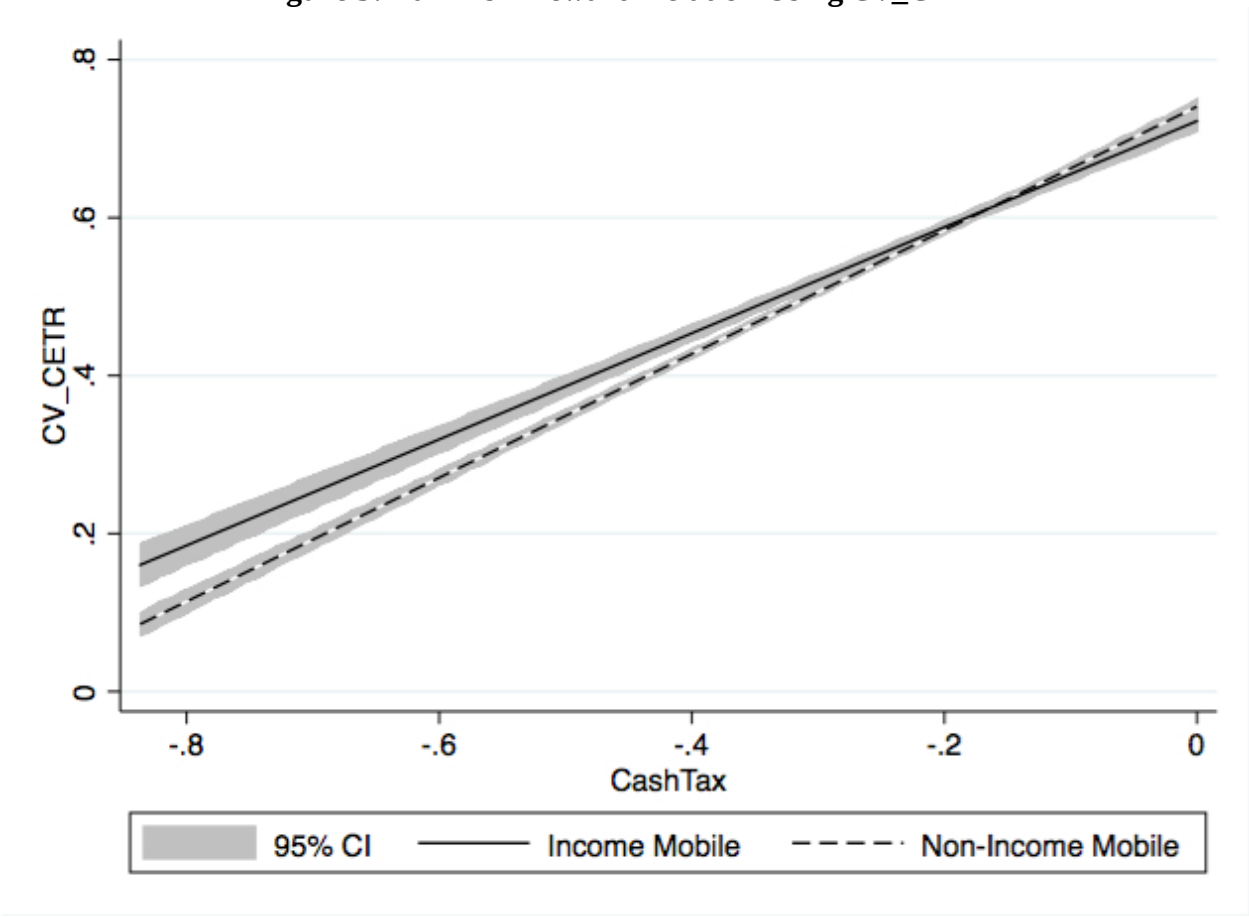
The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. For each test of mean and median differences, we limit the sample to observations with non-missing variables. *CashTax* is the one-year cash effective tax rate *(TXPD/PI)* multiplied by (-1) so as to be increasing in tax avoidance. *TaxReserve* is the reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT)*.

Figure 2: Tax Risk-Reward Relation Using *Std_CETR*



The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. For each test of mean and median differences, we limit the sample to observations with non-missing variables. *CashTax* is the one-year cash effective tax rate *(TXPD/PI)* multiplied by (-1) so as to be increasing in tax avoidance. *Std_CETR* is the five-year standard deviation of *CashETR*.

Figure 3: Tax Risk-Reward Relation Using *CV_CETR*



The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. For each test of mean and median differences, we limit the sample to observations with non-missing variables. *CashTax* is the one-year cash effective tax rate *(TXPD/PI)* multiplied by (-1) so as to be increasing in tax avoidance. *CV_CETR* is *Std_CETR* scaled by the five-year mean *CashETR*, where *Std_CETR* is the five-year standard deviation of *CashETR*.

Appendix A
Alternative Calculation of Income Mobility

Because it is not clear that equal weighting of all components is appropriate, we conduct principal component analysis to provide an alternative classification of income mobile firms. This analysis generates two distinct components, with component loadings that emerge presented below.

	Component 1 (*Development*)	Component 2 (*Uniqueness*)
Rotated Component Loading		
R&D	**0.8328**	0.0757
Advertising	(0.1342)	**0.9094**
PctForeignSales	**0.5732**	(0.0905)
PctGP	0.5058	**0.4832**
HighTech	**0.7752**	0.0190

R&D is research and development expense scaled by total assets *(XRD/AT). Advertising* is advertising expense scaled by total assets *(XAD/AT). PctForeignSales* is foreign sales reported in the Compustat segments database scaled by worldwide total sales *(SALE). PctGP* is gross profit percentage (*GP/SALE*). *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry as defined in Francis and Schipper (1999).

The first component, which we label *Development*, appears to capture characteristics associated with firms' ability to develop innovative products and processes with international appeal and thereby benefit from global tax planning. The second component, which we label *Uniqueness*, appears to serve as a proxy for product differentiation and uniqueness, which can be crucial in allowing firms more flexibility to strategically set intercompany prices and therefore shift income in tax-advantaged ways. Following Bratten et al. (2013), we divide observations into two groups based on the median values of each component and set *IncomeMobile*=1 for observations that fall above the median on both components. All results presented herein are qualitatively similar using this approach to identify income mobile firms, although the principal component analysis approach is not robust when we include loss firms in the sample.

Table 1
Descriptive Statistics

	N	Mean	Std Dev	20th Pctl	Median	80th Pctl
Firm Characteristics						
Sales	46,044	3,297	8,969	64.61	477.6	2,488
Assets	46,044	8,313	51,686	81.77	636.1	3,503
Tax Avoidance Measures						
CashETR	46,044	0.260	0.173	0.058	0.258	0.380
CashETR5	37,338	0.289	0.144	0.160	0.294	0.387
ETR	43,993	0.322	0.112	0.228	0.350	0.392
StateETR	33,514	0.043	0.043	0.006	0.037	0.064
ForeignETR	14,980	0.276	0.175	0.108	0.278	0.396
PRE	3,379	1,865	5,050	30.57	254.0	1,540
Tax Risk Measures						
TaxReserve	9,134	0.008	0.013	0.000	0.003	0.014
Std_CETR	37,387	0.114	0.081	0.043	0.094	0.179
CV_CETR	36,987	0.535	0.386	0.220	0.436	0.866
Valuation Variables						
Tobinsq	46,044	1.794	1.147	1.035	1.403	2.238
NOL	46,044	0.043	0.152	0.000	0.000	0.029
Size	46,044	6.211	2.011	4.168	6.169	7.819
Leverage	46,044	0.194	0.171	0.013	0.168	0.349
Foreign	46,044	0.013	0.028	0.000	0.000	0.018
Volatility	46,044	0.466	0.211	0.300	0.427	0.645
CapEx	46,044	0.053	0.061	0.009	0.036	0.079
SalesGrowth	46,034	0.149	0.206	0.01	0.101	0.238

The sample comprises 46,044 profitable, non-flow-through firm-year observations from Compustat that have values of *CashETR* between 0 and 1. We describe the variables only for the observations that have non-missing values because not all variables presented here are used in our main tests. *Sales* are annual sales (*SALE)* in $USD millions. Assets are year-end total assets in $USD millions (*AT)*. *CashETR* is cash taxes paid scaled by total pre-tax income (*TXPD/PI)*. *CashETR5* is the five-year sum of cash taxes paid scaled by the five year sum of total pre-tax income. *ETR* is total (current plus deferred) tax expense scaled by total pre-tax income *(TXT/PI)*. *StateETR* is total (current plus deferred) state tax expense scaled by total pre-tax income (*(TXS+TXDS)/PI)*. *ForeignETR* is total (current plus deferred) foreign tax expense scaled by pre-tax income ((*TXFO+TXDFO)/PI*). *PRE* is permanently reinvested earnings reported by Audit Analytics. *TaxReserve* is the FIN 48 reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT*). *Std_CETR* is the five-year standard deviation of *CashETR*. *CV_CETR* is *Std_CETR* scaled by the five-year mean *CashCETR. Tobin's q* is the market value of assets scaled by the book value of assets. *NOL* is tax loss carryforwards scaled by total assets (*TLCF/AT*). *Size* is the natural log of total sales (*SALE)*. *Leverage* is total (current and long-term) debt scaled by total assets (*(DLC+DLTT)/LT)*. *Foreign* is the absolute value of foreign pre-tax income (*PIFO)* scaled by assets (*AT*). *Volatility* is the annualized standard deviation of stock returns over the prior 60 months. *CapEx* is capital expenditures scaled by total assets (*CAPX/AT)*. *SalesGrowth* is the average percentage growth in sales (*SALE)* over the three prior years ending in year t. We replace missing values of *NOL*, *Foreign* and *CapEx* with zero.

Table 2
Income Mobile Firms

Panel A
Examples of Income Mobile and Non-Income Mobile Firms

Income Mobile	Non-Income Mobile
Abbott Labs	Albertson's
Agilent Technologies	Alcoa
Ebay	Barnes & Noble Inc.
HP	Costco Wholesale
IBM	Dillard's Inc.
Intel	Marathon Oil Company
Nike	Metlife Inc.
Wyeth	Wells Fargo & Co

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. This panel provides examples of firms in each group. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT), Advertising (XAD/AT), PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry.

Panel B
Percent of Observations in Each Group That Are Income Mobile

Group	% Income Mobile
High_R&D	78.22%
High_PctGP	45.17%
High_PctForeignSales	54.89%
High_Advertising	38.34%
HighTech	83.28%
Full Sample	24.09%

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. Groups represent the highest quintile of each component of *IncomeMobile.* For example, 78.22% of all observations in the top quintile of *R&D* are classified as Income Mobile. *IncomeMobile* is as defined above. *High_R&D, High_PctGP, High_PctForeignSales* and *High_Advertising* are indicator variables equal to 1 if the observation is in the top quintile of the variable of interest. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is as defined above.

Panel C
Percent of Income Mobile Observations in Each Group

Group	% Income Mobile
High_R&D	64.93%
High_PctGP	37.51%
High_PctForeignSales	45.56%
High_Advertising	31.84%
HighTech	66.49%
Full Sample	24.09%

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. Groups represent the highest quintile of each component of *IncomeMobile.* For example, 64.93% of all observations where *IncomeMobile*=1 are also in the top quintile of *R&D*. *High_R&D, High_PctGP, High_PctForeignSales* and *High_Advertising* and *HighTech* are as defined above.

Table 2 (cont'd)
Panel D
Percent of Observations by Industry and Income Mobility

	Income Mobile		Non-Income Mobile	
FF Industry	**N**	**%**	**N**	**%**
Aircraft, Ships and Railroads	8	0.07%	346	0.99%
Apparel	63	0.57%	722	2.07%
Automobiles	105	0.95%	666	1.91%
Beer and Liquor	47	0.42%	145	0.41%
Business Equipment	4,043	36.46%	1,177	3.37%
Business Supplies and Shipping Containers	89	0.80%	755	2.16%
Chemicals	241	2.17%	783	2.24%
Communication	341	3.07%	588	1.68%
Construction Materials	102	0.92%	1,420	4.06%
Consumer Goods	341	3.07%	525	1.50%
Electrical Equipment	521	4.70%	231	0.66%
Fabricated Products	445	4.01%	1,606	4.59%
Financial Institutions	111	1.00%	7,072	20.23%
Food Products	181	1.63%	1,057	3.02%
Healthcare	1,889	17.03%	1,569	4.49%
Other	141	1.27%	925	2.65%
Personal and Business Services	1,936	17.46%	2,515	7.20%
Petroleum and Natural Gas	36	0.32%	1,769	5.06%
Precious Metals and Mining	7	0.06%	375	1.07%
Printing and Publishing	56	0.50%	518	1.48%
Recreation	222	2.00%	660	1.89%
Retail	55	0.50%	2,540	7.27%
Steel Works	14	0.13%	676	1.93%
Textiles	3	0.03%	217	0.62%
Tobacco Products	22	0.20%	30	0.09%
Transportation	11	0.10%	1,218	3.48%
Wholesale	60	0.54%	1,818	5.20%
Coal	0	0.00%	56	0.16%
Restaurants, Hotels, and Motels	0	0.00%	848	2.43%
Utilities	0	0.00%	2,127	6.09%
Total	11,090	100.0%	34,954	100.0%

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,964 firm-years where *IncomeMobile*=0. This panel presents the distribution of observations where *IncomeMobile*=1 across 30 industry groupings as defined by Fama and French. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT), Advertising (XAD/AT), PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 2 (cont'd)
Panel E
Descriptive Statistics by Income Mobility

	IncomeMobile			Non-Income Mobile		
	N	Mean	Median	N	Mean	Median
Firm Characteristics						
Sales	11,090	3,905	429	34,954	3,104	496.4 *
Assets	11,090	4,937	521	34,954	9,383	676.2 ***
Income Mobility Characteristics						
R&D	11,090	0.067	0.056	34,954	0.007 ***	0.000 ***
Advertising	11,090	0.014	0.000	34,954	0.008 ***	0.000 ***
PctForeignSales	11,090	0.362	0.340	34,954	0.113 ***	0.000 ***
PctGP	11,090	0.537	0.527	34,954	0.357 ***	0.316 ***
HighTech	11,090	0.665	1.000	34,954	0.042 ***	0.000 ***

The sample of 46,044 profitable, non-flow-through firm-year observations from Compustat that have values of *CashETR* between 0 and 1 comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. For each test of mean and median differences, we limit the sample to the observations with non-missing variables. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *Sales* are annual sales in $USD millions (*SALE)*. Assets are year-end total assets in $USD millions (*AT)*. *CashETR* is cash taxes paid scaled by total pre-tax income (*TXPD/PI*). *CashETR5* is the five-year sum of cash taxes paid scaled by the five year sum of total pre-tax income. *ETR* is total (current plus deferred) tax expense scaled by total pre-tax income (*TXT/PI)*. *StateETR* is total (current plus deferred) state tax expense ((*TXS+TXDS)/PI)* scaled by total pre-tax income. *ForeignETR* is total (current plus deferred) foreign tax expense scaled by foreign pre-tax income ((*TXFO+TXDFO)/PIFO*). *PRE* is permanently reinvested earnings reported by Audit Analytics *TaxReserve* is the *FIN 48* reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT*). ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 3
Tax Motivated Income Shifting

Panel A
Univariate Analysis of Income Shifting Variables

	IncomeMobile (N=3,267)		Non-Income Mobile (N=9,698)		Difference	
	Mean	Median	Mean	Median	Mean	Median
Dependent Variable						
FOR_ROS	0.125	0.097	0.111	0.084	0.014 ***	0.013 ***
Control Variables						
WW_ROS	0.140	0.120	0.098	0.081	0.042 ***	0.039 ***
FTR	0.055	0.063	0.020	0.025	0.035 ***	0.038 ***

Table 3 uses a sample of 12,965 firm-year observations with foreign sales greater than 0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *FOR_ROS* is pre-tax foreign income (*PIFO*) scaled by foreign sales as reported in the Compustat segments database. *WW_ROS* is pre-tax income (*PI*) scaled by total sales (*SALE*). *FTR* is the difference between the US statutory tax rate of 35% and the firm's average foreign tax rate, measured as total foreign taxes (*TXFO+TXDFO*) divided by total foreign sales. The incentive to shift income to foreign jurisdictions is increasing in *FTR*. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 3, cont'd
Panel B
Multivariate Analysis

*FOR_ROS = β0 + β1*WW_ROS + β2*IncomeMobile + β3*IncomeMobile*FTR + β4*Non-IncomeMobile*FTR + YearFE*

Independent Variables	Predicted Sign	
Intercept		0.0537 ***
		(0.011)
Variables of interest		
WW_ROS	+	0.5470 ***
		(0.025)
IncomeMobile	+	-0.0108 ***
		(0.004)
IncomeMobile*FTR	+	0.1338 ***
		(0.011)
Non-IncomeMobile*FTR	+	0.0811 ***
		(0.007)
F-test		
β3>β4		<0.0001
Adj. R^2		0.334
Firm-year observations		12965

Table 3 uses a sample of 12,965 firm-year observations with foreign sales greater than 0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. *Non-IncomeMobile* is an indicator variable equal to 1 if *IncomeMobile* is equal to 0. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *FOR_ROS* is pre-tax foreign income (*PIFO*) scaled by foreign sales as reported in the Compustat segments database. *WW_ROS* is pre-tax income (*PI*) scaled by total sales (*SALE*). *FTR* is the difference between the US statutory tax rate of 35% and the firm's average foreign tax rate, measured as total foreign taxes (*TXFO+TXDFO*) divided by total foreign sales. The incentive to shift income to foreign jurisdictions is increasing in *FTR*. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 4
Evidence on Income Mobile Tax Avoidance (H1)

Panel A
Tax Avoidance by Income Mobility

	IncomeMobile			Non-Income Mobile		
	N	Mean	Median	N	Mean	Median
CashETR	11,090	0.238	0.225	34,954	0.267 ***	0.267 ***
CashETR5	8,907	0.276	0.275	28,431	0.293 ***	0.300 ***
ETR	10,419	0.297	0.322	33,574	0.330 ***	0.356 ***
StateETR	8,424	0.035	0.028	25,090	0.045 ***	0.040 ***
ForeignETR	6,543	0.262	0.257	8,437	0.286 ***	0.290 ***
PRE	1,441	2,663	325.1	1,938	1,272	205.80 ***

The sample of 46,044 profitable, non-flow-through firm-year observations from Compustat that have values of *CashETR* between 0 and 1 comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. For each test of mean and median differences, we limit the sample to the observations with non-missing variables. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *CashETR* is cash taxes paid scaled by total pre-tax income (*TXPD/PI*). *CashETR5* is the five-year sum of cash taxes paid scaled by the five year sum of total pre-tax income. *ETR* is total (current plus deferred) tax expense scaled by total pre-tax income (*TXT/PI)*. *StateETR* is total (current plus deferred) state tax expense ((*TXS+TXDS)/PI)* scaled by total pre-tax income. *ForeignETR* is total (current plus deferred) foreign tax expense scaled by foreign pre-tax income ((*TXFO+TXDFO)/PIFO*). *PRE* is permanently reinvested earnings reported by Audit Analytics *TaxReserve* is the *FIN 48* reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT*). ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Panel B
Average Tax Avoidance by Income Mobile Component and Income Mobility

	Income Mobile			Non-Income Mobile		
Group	No. Obs.	Avg CETR	Avg CETR5	No. Obs.	Avg CETR	Avg CETR5
High_R&DExpense	7,201	22.10%	26.36%	2,005	23.18% **	29.06% ***
High_PctGP	4,160	22.01%	25.33%	5,049	23.92% ***	26.18% ***
High_PctForeignSales	5,053	23.94%	27.12%	4,153	26.52% ***	28.95% ***
High_Advertising	3,531	25.68%	29.15%	5,678	28.89% ***	31.47% ***
HighTech	7,374	22.00%	26.07%	1,480	23.73% ***	28.19% ***
Full Sample	11,090	23.75%	27.60%	34,954	26.69% ***	29.31% ***

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. This panel compares average one- and five-year cash effective tax rates between observations where *IncomeMobile*=1 and where *IncomeMobile=0* within each component of *IncomeMobile*. For example, of the 9,206 observations in the top quintile of *R&D*, 7,201 are classified as income mobile. These 7,201 income mobile observations in the highest quintile of *R&D* have an average *CETR* of 22.10% and an average *CETR5* of 26.36%. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. *High_R&D*, *High_PctGP*, *High_PctForeignSales* and *High_Advertising* are indicator variables equal to 1 if the observation is in the top quintile of the variable of interest. When ranking, we set missing values of *R&D*, *Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 5
Market Test of Tax Avoidance Based on Income Mobility

Panel A
Univariate Analysis of Valuation Variables

	IncomeMobile			Non-Income Mobile		
	N	Mean	Median	N	Mean	Median
Valuation Variables						
Tobinsq	11,090	2.408	1.976	34,954	1.599 ***	1.289 ***
NOL	11,090	0.078	0.000	34,954	0.032 ***	0.000 ***
Size	11,090	6.215	6.062	34,954	6.210 ***	6.207 *
Leverage	11,090	0.137	0.093	34,954	0.212 ***	0.190 ***
Foreign	11,090	0.030	0.01	34,954	0.008 ***	0.000 ***
Volatility	11,090	0.528	0.493	34,954	0.446 ***	0.409 ***
CapEx	11,090	0.046	0.035	34,954	0.055 ***	0.036 **
SalesGrowth	11,089	0.163	0.116	34,945	0.145 ***	0.097 ***

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT)*, *Advertising (XAD/AT)*, *PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *Tobin's q* is the market value of assets scaled by the book value of assets *((AT+PRCC_F*CHSO-CEQ)/AT). NOL* is tax loss carryforwards *(TLCF)* scaled by assets. *Size* is the natural log of sales (*SALE). Foreign* is the absolute value of foreign pre-tax income *(PIFO)* scaled by pre-tax income (*PI). Leverage* is total debt *(DLTT+DLC)* scaled by assets. *Volatility* is the annualized standard deviation of monthly stock returns (*RET)* over 60 months. *CapEx* is capital expenditures *(CAPX)* scaled by assets (*AT*). *SalesGrowth* is the average percentage of three-year sales growth ending in year *t*. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 5, Panel B
Multivariate Analysis of Market Valuation

*Tobin's q=β_0+ β_1*CashTax + β2*IncomeMobile + β3*CashTax*IncomeMobile + Controls + Year FE + Industry FE +ε*

		CashETR		CashETR5	
Independent Variables	Sign	(a)	(b)	(c)	(d)
Variables of interest					
CashTax	+	0.2766 ***	0.2504 ***	0.5941 ***	0.4160 ***
		(0.048)	(0.047)	(0.078)	(0.077)
IncomeMobile	+	0.4324 ***	0.4255 ***	0.4802 ***	0.4826 ***
		(0.050)	(0.048)	(0.067)	(0.065)
CashTax*IncomeMobile	+	0.5803 ***	0.5211 ***	0.5659 ***	0.5450 ***
		(0.110)	(0.106)	(0.163)	(0.157)
Control variables					
NOL	-	-0.2926 ***	-0.1941 ***	-0.6185 ***	-0.4981 ***
		(0.063)	(0.060)	(0.088)	(0.084)
R&D	+	4.2655 ***	4.0753 ***	4.0523 ***	3.9405 ***
		(0.437)	(0.420)	(0.510)	(0.496)
Size	+	0.0515 ***	0.0463 ***	0.0575 ***	0.0513 ***
		(0.007)	(0.006)	(0.007)	(0.007)
Leverage	-	-1.5354 ***	-1.5633 ***	-1.5711 ***	-1.6029 ***
		(0.070)	(0.069)	(0.080)	(0.079)
Foreign	+	3.8678 ***	4.0438 ***	4.1670 ***	4.2760 ***
		(0.548)	(0.539)	(0.574)	(0.569)
Volatility	+	0.4434 ***	0.1965 ***	0.6185 ***	0.3506 ***
		(0.055)	(0.052)	(0.067)	(0.063)
CapEx	+		1.9791 ***		1.8140 ***
			(0.212)		(0.236)
SalesGrowth	+		1.0114 ***		0.9949 ***
			(0.048)		(0.059)
Adj. R^2		26.44%	30.31%	27.55%	30.59%
Firm-year observations		46,044	46,034	37,338	37,334

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34, 954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT), Advertising (XAD/AT), PctForeignSales* and *PctGP* (GP/SALE) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. *Tobin's q* is the market value of assets scaled by the book value of assets *((AT+PRCC_F*CHSO-CEQ)/AT). CashTax* is either the one- or five-year cash effective tax rate *(TXPD/PI)* multiplied by (-1) so as to be increasing in tax avoidance. *NOL* is tax loss carryforwards *(TLCF)* scaled by assets. *Size* is the natural log of sales. *Foreign* is the absolute value of foreign pre-tax income *(PIFO)* scaled by pre-tax income (*PI). Leverage* is total debt *(DLTT+DLC)* scaled by assets. *Volatility* is the annualized standard deviation of monthly stock returns over 60 months. *CapEx* is capital expenditures *(CAPX)* scaled by assets (*AT). SalesGrowth* is the average percentage of three-year sales growth ending in year *t*. Standard errors clustered by firm are in parentheses. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Table 6
Evidence on Income Mobile Tax Risk (H2)

Panel A
Univariate Evidence

	IncomeMobile			Non-Income Mobile		
	N	Mean	Median	N	Mean	Median
Risk Measures						
TaxReserve	2,520	0.016	0.009	6,614	0.005 ***	0.002 ***
Std_CETR	10,066	0.113	0.092	27,321	0.114 ***	0.095 **
CV_CETR	10,016	0.557	0.464	26,971	0.527 ***	0.426 ***

The sample of 46,044 firm-year observations comprises 11,090 firm-years where *IncomeMobile* =1 and 34,954 firm-years where *IncomeMobile*=0. *IncomeMobile* is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT), Advertising (XAD/AT), PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. For each test of mean and median differences, we limit the sample to observations with non-missing variables. *TaxReserve* is the reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT)*. *Std_CETR* is the five-year standard deviation of *CashETR*. *CV_CETR* is *Std_CETR* scaled by the five-year mean *CashETR.* ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.

Panel B
Multivariate Evidence

$$Risk = \beta_0 + \beta_1 * CashTax + \beta_2 * IncomeMobile + \beta_3 * CashTax * IncomeMobile$$

Independent Variables	TaxReserve	Std_CETR	CV_CETR
Intercept	0.0058 ***	0.0800 ***	0.7407 ***
	(0.0000)	(0.0010)	(0.0040)
CashTax	0.0011	-0.1260 ***	0.7833 ***
	(0.0010)	(0.0030)	(0.0130)
IncomeMobile	0.0114 ***	-0.0037 *	-0.0183 **
	(0.0010)	(0.0020)	(0.0080)
CashTax*IncomeMobile	0.0057 ***	-0.0229 ***	-0.1114 ***
	(0.0020)	(0.0050)	(0.0250)
Adj. R^2	12.19%	7.92%	11.26%
Firm-year observations	9,134	37,387	36,987

IncomeMobile is an indicator variable equal to 1 if the sum of the annual rank of *R&D (XRD/AT), Advertising (XAD/AT), PctForeignSales* and *PctGP* (*GP/SALE*) plus (*HighTech**4) is in the top quintile by year; once a firm is characterized as income mobile, we set *IncomeMobile* to 1 for all subsequent firm-years. When ranking, we set missing values of *R&D, Advertising* and *Foreign* to zero. *HighTech* is an indicator variable equal to 1 if the observation is in a high-tech industry. For each test of mean and median differences, we limit the sample to observations with non-missing variables. *TaxReserve* is the reserve for uncertain tax benefits scaled by total assets (*TXTUBEND/AT)*. *Std_CETR* is the five-year standard deviation of *CashETR*. *CV_CETR* is *Std_CETR* scaled by the five-year mean *CashETR. CashTax* is the one-year cash effective tax rate *(TXPD/PI)* multiplied by (-1) so as to be increasing in tax avoidance. ***, ** and * represent two-tailed significance at the 1%, 5% and 10% level.