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Religiosity and Tax Avoidance

Abstract

In this paper, we examine religiosity as one determinant of tax avoidance by corporate and individual taxpayers. Prior research suggests a relation between religiosity and risk aversion. Because aggressive tax avoidance strategies involve significant uncertainty and possible penalties and damage to reputation, we predict that higher levels of religiosity are associated with less aggressive (i.e., less risky) tax positions. Consistent with this prediction, we find that firms headquartered in more religious US counties are less likely to avoid taxes. We also find that religiosity is consistently associated with lower tax avoidance by individual taxpayers as measured by underreported income. These results hold after controlling for several firm-level as well as county-level demographic characteristics identified in prior research as affecting tax avoidance by corporate and/or individual taxpayers. We conclude that religiosity is a significant determinant of tax avoidance by corporate and individual taxpayers.

Key words: tax avoidance, religiosity
JEL: M40

Religiosity and Tax Avoidance

1. INTRODUCTION

In this paper we examine religiosity as one determinant of corporate and individual tax avoidance. At this time, our understanding of why some firms and individuals avoid taxes more than others is less than complete (Shevlin 2007). With respect to firms, prior research suggests that tax avoidance in influenced by corporate attributes such as profitability, intangible assets, R&D spending, the extent of foreign operations, leverage and aggressiveness in financial reporting (e.g., Frank et al. 2009; Graham and Tucker 2006; Gupta and Newberry 1997; Rego 2003; Wilson 2009). However, Dyreng et al. (2010a) suggest that individual managers have an influence on a firm's tax aggressiveness that is incremental to firm characteristics. Because tax avoidance is risky, it can impose costs on managers as well as their employers. Given that religiosity is associated with risk aversion (Hilary and Hui 2009; Miller and Hoffman 1995; Osoba 2003), we argue that religiosity can influence managers to undertake less aggressive (i.e., risky) tax positions, and thus account for some of the variation in tax avoidance across firms.[1]

Specifically, we hypothesize that higher levels of religious affiliation in the population in the county of a firm's corporate headquarters (or an individual taxpayer's domicile) is associated with lower tax avoidance. The extant literature offers two related perspectives on religiosity that motivate our inquiry. The first perspective focuses on risk aversion and the role of religion in lowering risk taking. Specifically, prior research suggests that religiosity is positively correlated with the individual's aversion to risk, i.e., more anxious individuals are more likely to seek comfort through participation in religion (Malinowski 1925; Gaspar and Clore 1998; Miller and Hoffman 1995). Recent survey evidence also suggests a negative association between religious attendance and measures of risk-taking such as living in unsafe or unsecure localities or trying new/different things in life (Hilary and Hui 2009). Although the

[1] As noted by Slemrod (2007), the line between legal tax avoidance and illegal tax evasion is quite blurry since what is illegal is generally not known ex ante, i.e., given the complexity of the tax law, the legality of tax shelter transactions is often determined ex post. However, aggressive (risky) tax avoidance involves greater uncertainty, i.e., involve tax positions that are less likely to be sustained upon audit (Rego and Wilson 2012).

benefits of tax avoidance are straightforward (i.e., increased cash flow), tax aggressiveness can also impose substantial costs in the form of time devoted to tax planning and resolving IRS audits. Further, if the IRS is successful in challenging an aggressive tax position, the costs can be materially higher in terms of interest charges, legal penalties, and reputation loss if the aggressive tax avoidance becomes publicly known (e.g., Hanlon and Slemrod 2009; Wilson 2009). Consequently, consistent with risk aversion (i.e., to avoid the risk of being audited and exposed to these penalties and losses), religiosity can be expected to be associated with lower tax avoidance for both corporate and individual taxpayers.

The second perspective on religiosity emphasizes the role of religion as a social mechanism for influencing behavior in economic and social interactions (Kennedy and Lawton 1998; North 1991; Stulz and Williamson 2003). Religion-based social norms potentially are a powerful behavioral influence because they encompass a wider menu of rewards and sanctions, i.e., religion may be viewed as a sanctioning system that inhibits unethical or opportunistic behavior. Further, violation of religion-based social norms may induce negative feelings in the individual which, in turn, may result in a tarnished self-image that could impair the social functioning of the individual. Potentially, the negative feelings associated with violating religion-based social norms may serve as a stronger deterrent than the perceived threat of legal sanctions (Grasmick and Bursick 1990).

Consistent with the notion that a religion-based social identity and sense of belonging affects individual behavior, recent empirical research in accounting and finance suggests that local religious beliefs impact a wide range of corporate decisions including financial reporting irregularities and accruals-based earnings manipulation (Dyreng et al. 2012, McGuire et al. 2012), overgenerous executive compensation (Grullon et al. 2010), and risk exposure (Hilary and Hui 2009). Broadly speaking, the literature suggests that the behavior of individuals (including that of corporate senior executives) is shaped by the religious beliefs of the community in which the individual (firm) is domiciled (headquartered). In other words, local religious values cannot be separated from business life, i.e., individuals (whether they themselves are personally religious or not) are influenced by the religion-based social norms of the local community in which they work and reside. Thus, prior research suggests that

local religion-based social norms contribute to an individual's ethical behavior, and by extension, corporate behavior in terms of limiting opportunism in economic interactions (e.g., McGuire et al. 2012). Altogether, for reasons related to both perspectives, i.e., religiosity-related risk aversion as well as violation of religion-based social norms, we predict a negative relation between religiosity in the community (county) and tax avoidance by corporate and individual taxpayers.

To test our prediction, we analyze corporate and individual taxpayer data separately. We gauge corporate tax avoidance by utilizing a firm's cash effective tax rates, tax shelter prediction scores, and estimated amount of unrecognized tax benefits. To capture the extent of tax avoidance by individual taxpayers, we estimate the fraction of income omitted from individual tax returns filed within the county by comparing the aggregate county-wide adjusted gross income (per the Internal Revenue Service) with the aggregate county-wide household income (per the U.S. Census Bureau annual American Community Services survey). Consistent with prior research (e.g., Hilary and Hui 2009), we measure religiosity based on the extent of religious affiliation in the county in which a firm is headquartered or an individual taxpayer is domiciled. Specifically, we measure religiosity as the fraction of the U.S. county-wide population that claims affiliation with an organized religion as reported by the American Religions Data Archive's (ARDA) religious congregations and membership studies. In addition, we decompose the religiosity measure by examining Protestant and Catholic adherence.[2]

For the corporate analysis, our sample consists of over 33,000 firm-years (4,670 firms) over a 19-year period (1992-2010). For the analysis of individual taxpayers, our sample covers 3,700 county-years spanning the period 2005-2009. Our results indicate that religiosity is consistently associated with lower tax avoidance by corporations as well as individual taxpayers. In terms of economic significance, we find that an increase in county-level religiosity by one standard deviation increases corporate effective tax rates by 0.48 percentage points and reduces individual tax avoidance at the aggregate county level by 0.89

[2] Hilary and Hui (2009) suggest that decomposing the religiosity metric into Catholic and Protestant components helps eliminate the possibility of correlated omitted variables because Catholic and Protestant religious adherence are negatively correlated, creating a situation where an omitted variable would need to be correlated in opposite directions with the two religion variables, and also correlated with the dependent variable.

percentage points. These results hold after controlling for several firm-level as well as county-level demographic characteristics identified in prior research as affecting tax avoidance by corporate and/or individual taxpayers.

Our study makes two contributions to the literature. First, to date, empirical tax research has focused primarily on the role of firm characteristics in tax avoidance (for reviews, see Shackelford and Shevlin 2001; Hanlon and Heitzman 2010). More recently, Dyreng et al. (2010) find that individual executives have an incremental effect on their firms' tax avoidance that cannot be explained by firm characteristics. Their argument is that individual top executives are partially responsible for the variation in tax avoidance across firms, not necessarily through direct involvement in the tax function, but by setting the "tone at the top." Relatedly, Dyreng et al. (2012) finds that firms in more religious areas are less likely to use a tax shelter. Our study complements Dyreng et al. (2012) by undertaking a more comprehensive examination of the effects of religious social norms on tax avoidance by examining multiple measures of corporate tax avoidance and decomposing the religiosity measures into Protestant and Catholic components. We show that firms headquartered in more religious communities are less likely to avoid taxes. Thus, our results suggest that religiosity may explain the channel by which corporate executives exercise their incremental effect on tax avoidance. In addition, we examine how individual taxpayers' characteristics influence their tax reporting choices and find that religiosity is associated with lower tax avoidance by *individual* taxpayers.

Second, we contribute to the broader literature stream that suggests that religion-based social norms can serve as a mechanism for influencing corporate decision making (e.g., Dyreng et al. 2012; Grullon et al. 2010; Hilary and Hui 2009; McGuire et al. 2011). Our study contributes to that literature by suggesting that religiosity can serve as a social mechanism for lowering corporate tax avoidance as well. Given the complexity of the current tax law, the sophistication of extant tax shelters, the decline in the IRS' enforcement activities, and the ubiquity and salience of tax avoidance (Slemrod 2007), it is important to examine and document alternative mechanisms that can potentially contribute to greater tax compliance. Further, we decompose the religiosity measures into Protestant and Catholic components

and assess the effects of the two denominations on tax avoidance for both corporate and individual taxpayers. Notably, Shu et al. (2011) examine religious beliefs and mutual fund risk-taking behaviors, and suggest that Protestants are more risk averse than Catholics. However, as noted previously, although the first perspective on religiosity relates to risk aversion, there is also a second perspective which focuses on moral restraint, i.e., the role of religion in inhibiting unethical or opportunistic behavior. Consistent with the notion that Catholics tend to view taxes as a moral responsibility to support the poor (Curran 1985; USCatholic.org 2012), our findings broadly suggest that Catholics engage in less tax avoidance than Protestants.

The rest of this paper is structured as follows: Section 2 discusses the development of our Hypotheses, while sections 3 and 4 outline our sample, research design and empirical results for corporate and individual taxpayers, respectively. Section 6 concludes the paper.

2. Hypotheses Development

As evidence of the ubiquity and importance of tax avoidance in the US, Slemrod (2007) suggests that the overall avoidance rate for federal (corporate and individual) income taxes is about 17 percent with an annual tax gap (i.e., the difference between taxes owed and paid) in excess of $200 billion. By contrast, the IRS (2006) estimates the tax gap for tax year 2001 at $353 billion. Further, Slemrod (2007) notes that the Internal Revenue Services' (IRS) enforcement activities have declined sharply in recent years while the complexity of the tax law and the sophistication of tax shelters have grown, increasing the likelihood of tax avoidance. Collectively, these developments increase the relevance and importance of understanding tax avoidance by corporate and individual taxpayers.

2.1. Corporate tax avoidance

Prior research has identified several firm characteristics as being associated with variations in lower effective tax rates (ETRs) as a measure of tax avoidance across firms. These characteristics include firm size, profitability, leverage, capital intensity, and foreign operations (Gupta and Newberry 1997; Porcano 1986; Rego 2003; Shevlin and Porter 1992; Stickney and McGee 1982; Zimmerman 1983). More recently, companies accused of tax sheltering have been found to be more profitable, to report

larger book-tax differences, have higher R&D spending and less leverage, and to operate subsidiaries in foreign tax havens (Graham and Tucker 2006; Lisowsky 2010; Wilson 2009). Further, ownership structure (family ownership and dual class share structure) appears to be related to tax avoidance behavior (Chen et al. 2010; McGuire et al. 2012). However, private equity ownership appears to be related to an increase in tax avoidance in the firms they invest (Badertscher et al. 2011).

Separately, Slemrod (2004) suggests that risk-neutral shareholders presumably expect managers to act on their behalf and utilize all available opportunities (subject to cost-benefit considerations) to minimize corporate tax liabilities. Indeed, given that the income tax represents a significant cost of doing business (potentially amounting to a third of pre-tax earnings), Weisbach (2002) refers to the under-sheltering puzzle, i.e., why isn't there more corporate tax avoidance to benefit shareholders? However, placed in the context of the separation of ownership and control (agency problems), it is understandable that managers may be risk averse, i.e., have personal concerns about the probability of detection and punishment (penalties), leading to lower tax avoidance than otherwise. More recently, Dyreng et al. (2010) suggest that individual executives are an important determinant in their employers' tax avoidance, i.e., these managers have an incremental effect on tax avoidance that cannot be explained by firm characteristics.

One possible determinant of corporate tax avoidance that has been little explored in the prior literature involves managers and religiosity. However, the religiosity of corporate executives is neither public information nor directly observable. Indeed, it would be illegal for an employer or the IRS to inquire about the religious background of managers or other employees. Still, prior research suggests a positive relation between religiosity and the risk aversion of individuals. Thus, Miller and Hoffman (1995) report a negative association between religiosity and individuals' attitude to risk and danger. Also, Osoba (2003) provide evidence which suggests that church attendance is higher among risk-averse individuals. Similarly, Hilary and Hui (2009) indicate that individuals who attend religious services are less likely to accept riskier payouts and are also more risk averse. Further, they (Hilary and Hui 2009) indicate a link between religiosity at the county level and corporate behavior, i.e., firms domiciled in more

religious counties tend to be more risk averse as reflected in their corporate culture and behavior. In other words, they suggest that managers of firms headquartered in areas in which the population is more religious tend to be more risk averse. Thus, as noted previously, because tax avoidance is risky (i.e., involves tax positions that are less likely to be sustained upon audit and can expose the firm to legal penalties and loss of reputation), we argue that religiosity is related to lower tax avoidance.

Consistent with prior research (Hilary and Hui 2009; Kumar et al. 2011), we assume that religiosity at the local (county) level influences local cultural values and norms and consequently affects the tax avoidance of managers residing in that county, even if they are not personally religious. After all, corporate decisions are not made by companies but by their executives, and these executives' decisions at work are likely influenced by what they do in the outside social and cultural environment (Hilary and Hui 2009). Consequently, religiosity at the community level may be expected to influence corporate tax avoidance.

From a different (i.e., non-risk aversion) perspective, Anderson (1988) suggests that Adam Smith (of *Wealth of Nations* fame) viewed religion as a type of internal moral enforcement mechanism. From this perspective, religion is a social mechanism for internalizing beliefs that restrain unethical behavior (e.g., McGuire et al. 2012). This view is consistent with that of North (1991) who suggests that religious precepts reinforce local cultural traditions in limiting opportunism in economic and social interactions.

In sum, given the role of religiosity in increasing risk aversion and in inhibiting unethical or opportunistic behavior, we predict that religiosity has a restraining influence on corporate tax avoidance. Our first Hypothesis (for corporate taxpayers), stated in the alternate form, is as follows:

H1: For corporate taxpayers, there is negative relation between the religiosity of the county in which the firm is headquartered and tax avoidance.

2.2 Individual tax avoidance

An essential difference between individual and corporate tax avoidance is the absence of agency problems, i.e., the lack of separation of ownership and control as an issue. Consequently, individual tax avoidance decisions are likely to reflect solely the private interests of the individual

taxpayer. The prior literature (e.g., Fischer et al. 1992; Jackson and Milliron 1986; Slemrod 1992) suggests that individual avoidance is determined by marginal tax rates, audit rates (i.e., the likelihood of detection), and penalty rates. However, given the low frequency of IRS audits, Alm (1991) suggests that financial self-interests alone cannot totally describe individual tax compliance because avoidance is likely to be far higher if detection and punishment were the only influencing factors.[3]

In this section, we address the role of religiosity in explaining the variation in individual tax avoidance. Once again, the religiosity of individual taxpayers is not public information and it would be illegal for the IRS to inquire about the religious background of individual taxpayers. Still, the arguments for predicting that religiosity is related to lower tax avoidance for individual tax payers are broadly similar to the arguments discussed previously for corporate taxpayers. First, previous research suggests a positive relation between religiosity and risk aversion (Hilary and Hui 2009; Miller and Hoffman 1995; Osoba 2003). Given that tax avoidance is potentially risky (because of the risk of being audited, exposure to legal penalties and possible loss of reputation), and the relation between religiosity and risk aversion, we argue that religiosity is related to lower tax avoidance. Second, religion is a social mechanism for influencing conduct in economic and social interactions (Kennedy and Lawton 1998; North 1991; Stulz and Williamson 2003). Thus, religiosity can be expected to deter unethical behavior, i.e., the negative feelings associated with violating religion-based social norms may serve as a stronger deterrent than the perceived threat of legal sanctions (Grasmick and Bursick 1990). Hence, consistent with prior research (Hilary and Hui 2009; Kumar et al. 2011) we assume that individuals internalize the norms of the community is which they reside and act in-line with local values, i.e., that religiosity at the local (county) level influences local cultural values and norms and consequently affects the tax avoidance decisions of individuals residing in that county, even if they are not personally religious. In other words, community religious norms may be expected to influence personal decision making including tax avoidance.

Our second Hypothesis (for individual taxpayers), stated in the alternate form, is as follows:

[3] The "puzzle of tax compliance is why people pay taxes, not why they evade them," (Alm 1991, p. 578).

H2: For individual taxpayers, there is negative relation between tax avoidance and the religiosity of the county in which the individual taxpayer is located.

3. Corporate Tax Avoidance Tests

In this section, we discuss our hypothesis H1 concerning the impact of religiosity on corporate tax avoidance.

3.1 Empirical Model

To test our hypotheses, we estimate the following pooled cross-sectional regression equation using ordinary least squares (OLS):

$$TaxAv_{i,t} = \alpha_0 + \beta_1 RELIG_{i,t} + \gamma^j CNT_{j,i,t} + \delta^k DEMO_{k,i,t} + Industry\ fixed\ effects + e_{i,t} \quad (1)$$

where *TaxAv* is a proxy for tax avoidance, *RELIG* is a proxy for the religiosity of the county where the firm's headquarters is located, *CNT* denotes a set of j firm-level control variables that have been shown in the prior literature (e.g., Mills 1998; Manzon and Plesko 2002; Rego 2003; Dyreng et al. 2008; Frank et al. 2009; Chen et al. 2010) to be correlated with tax avoidance, and *DEMO* denotes a set of demographic characteristics of the county where a firm's headquarters is located. The definitions of all variables are provided in Appendix A. All regressions include industry (Fama-French 48 industry classification) fixed effects and are estimated with heteroskedasticity-robust standard errors which are clustered by firm and year. Reported results are based on all observations, and untabulated results do not alter our inferences when we estimate equation (1) by eliminating observations with a studentized residual greater than the absolute value of 3.

3.1.1. Dependent variables

The focus of our study is the relation between religiosity and a firm's tax avoidance. Following prior research, we use three separate proxies (measures) for tax avoidance to examine the robustness of the association with our test variable religiosity. Because each measure has its limitations, prior research does not rely on any one single measure of tax avoidance. We explain each of these measures in detail next.

Our first measure of tax avoidance is the long-term average cash effective tax rate (*CETR*). It is based on the work of Dyreng et al. (2008) and is calculated as the sum of the taxes paid in cash over the current and preceding four years (Compustat TXPD) divided by pretax book income (Compustat PI) less special items (SPI) summed over the corresponding period. Higher values of cash effective tax rates reflect lower tax avoidance.[4] This measure reflects both temporary and permanent book-tax differences, and avoids tax accrual effects present in the current tax expense (Hanlon and Heitzman 2010). Moreover, it is not affected by changes in the firm's tax contingencies or cushion, and therefore, gives an accurate estimate of tax avoidance activities at the firm level (Dyreng et al. 2008). In addition, calculating effective tax rates over a five year window avoids year-to-year volatility in annual effective tax rates and identifies firms successful at avoiding taxes in the long run.

A limitation of the *CETR* pointed out by Hanlon and Heitzman (2010) is that it does not distinguish between real activities that are tax-favored and other activities specifically undertaken to reduce taxes. Stated differently, effective tax rates capture a broad range of activities, many of which are not risky or unethical (e.g., tax avoidance by purchasing tax-exempt bonds). Our next two measures, adapted from Wilson (2009) and Rego and Wilson (2012), are intended to capture risky tax positions.

Our second measure of tax avoidance is the propensity to engage in tax sheltering (*SHELTER*), computed by using the following model obtained from logit model estimates reported in Table 5 of Wilson (2009):

$$SHELTER = -4.30 + 6.63*BTD - 1.72*LEV + 0.66*SIZE + 2.26*ROA + 1.62*FOREIGN\_INCOME + 1.56*RD$$

where *BTD* measures a firm's book tax differences, *LEV* is long-term debt divided by total assets, *SIZE* is log of total assets, *ROA* is net income divided by total assets, *FOREIGN_INCOME* is an indicator

[4]Because *CETR* is calculated using data from the current and preceding four fiscal years, there is likely to be some degree of across-time dependency in *CETR* by construction. Our research design explicitly controls for this feature by basing statistical inferences on standard errors that control for firm (and time) clustering. However, as yet another test, we repeat the analysis using only observations from every 5th year (i.e., 1992, 1997, etc.). For these observations, there is no overlap in the data used to calculate *CETR*, and hence no across-time dependency in *CETR*. The results (untabulated) were qualitatively unchanged.

variable equal to 1 for firms with foreign income, 0 otherwise, and *RD* is a firm's research and development expenses scaled by total assets. A higher value of *SHELTER* reflects a larger probability of engaging in tax sheltering. Because tax shelters are single-transaction activities, the *SHELTER* variable may not reflect the full extent of risky tax avoidance activities of the firm.

Our third measure of tax avoidance is a proxy for unrecognized tax benefits. Unrecognized tax benefits is an accrued balance sheet liability, recognized pursuant to FIN 48, depicting expected future assessments to be made by taxing authorities arising from aggressive tax positions taken in current and prior accounting periods. As Hanlon and Heitzman (2010, p. 143) note, "higher unrecognized tax benefits represent more uncertainty in the firm's tax positions and thus are likely indicative of the degree of uncertainty in a firm's tax avoidance." As an accounting accrual, unrecognized tax benefits are subject to management's judgment, and hence may be influenced by financial reporting incentives. Thus, unrecognized tax benefits represent a composite measure that reflects both tax avoidance and tax-based earnings management activity.

We calculate predicted unrecognized tax benefits (*PRED_UTB*) as the predicted value from the following equation (obtained from Table 1 in Rego and Wilson 2012): [5]

$$PRED\_UTB = -.004 + .011*ROA + .001*SIZE + .010*FOR\_SALE + .092*RD - .002*DISC\_ACCR + .003*LEV + .000*MB + .014*SGA + -.018*SALES\_GR$$

Where *DISC_ACCR* is a proxy for discretionary accruals calculated using performance adjusted modified Jones (1991) model, *FOR_SALE* is the ratio of foreign sales to total sales, *SGA* is selling and general

[5]Rego and Wilson (2012) derive their estimates using firms in the S&P 500, which is a subset of our sample. To the extent that a difference in the conditional expectation of unrecognized tax benefits for our sample (as compared to theirs) introduces measurement error into the dependent variable *PRED_UTB*, there is potential for our tests to have low power.

administrative expenses, *SALES_GR* is annual growth rate in sales, and all other variables are as defined before.[6] A higher value of *PRED_UTB* reflects a greater level of tax avoidance.

3.1.2 Test variable

Our data on religiosity are obtained from the American Religion Data Archive (ARDA), which was initially collected by Glenmary Research Center. ARDA contains data on the number of religious adherents within each county of the United States. According to the ARDA website (http://www.thearda.com/Archive/Files/Descriptions/RCMSCY.asp), adherents include "all members, including full members, their children and the estimated number of other participants who are not considered members; for example, the 'baptized,' 'those not confirmed,' 'those not eligible for communion,' 'those regularly attending services,' and the like." The data are compiled every 10 years, and we obtain our data from the 1990, 2000, and 2010 decennial surveys.

For the 2010 decennial survey, the Glenmary Research Center solicited for survey participation each of the 296 religious organizations listed in the Yearbook *of American and Canadian Churches*, and other bodies suggested by their Advisory Board. Two hundred thirty-six organizations participated, and each was asked to provide data on the number of congregations and adherents to their faith in each US county.

Glenmary Research Center proofed and compiled the data and published the results under the title Religious Congregations and Membership Study (2010). The process for the 1990 and 2000 surveys was similar, which were published under the titles Churches and Church Membership in the United States (1990) and title Religious Congregations and Membership Study (2000), respectively. The 1990 and 2000 surveys contain data on 133 and 149 religious organizations.[7,8]

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[6] We obtain *DISC_ACCR* as the residual from the following cross-sectional regression estimated by two-digit SIC industry and year: $TACCR_{it} = \alpha_0 + \alpha_1\ 1/AT_{it} + \alpha_2\ SSA_{it} + \alpha_3\ SPPENT_{it} + \alpha_4\ ROAit + \varepsilon_{it}$ where: *TACCR* = Total accrual using cash flow approach; *SSA* = Change in sales minus change in accounts receivable; *SPPENT*=Net value of property plan and equipment; and *ROA* = Return on assets.

[7]Surveys before 2000, including the 1990 survey that we use, include data on Judeo-Christian religious groups only. The 2000 ARDA survey was expanded to include non-Judeo-Christian religious groups (e.g., Buddhists, Hindus, etc.) and this was continued in the 2010 ARDA survey. The change in the universe of coverage beginning in the

Our main variable of interest is the degree of religiosity (*RELIG*) in the county where the firm is located.[9] We calculate *RELIG* as the fraction of corporate headquarter county-wide population that claims affiliation with an organized religion as reported in the 1990, 2000 and 2010 ARDA surveys. More specifically, we calculate *RELIG* in 1990 by dividing the 1990 survey variable *TOTADH* (i.e., total adherents) by the 1990 survey variable *TOTPOP* (i.e., county population), *RELIG* in 2000 as the 2000 survey variable *TOTRT* (i.e., rate of adherents per 1000 county population) multiplied by 1000, and *RELIG* in 2010 as the 2010 survey variable *TOTRATE* (i.e., rate of adherents per 1000 county population) multiplied by 1000. We follow previous studies (e.g., Alesina and La Ferrara 2000; Hillary and Hui 2009) and linearly interpolate the data to obtain the values in the missing years (from 1992 to 1999 and from 2001 to 2009).[10] Because recent research (e.g., Halek and Eisenhauer 2001; Kumar et al. 2011; Shu

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year 2000 survey introduces an across-time inconsistency in our definition of *RELIG*. In untabulated analysis, we recalculated *RELIG* from the year 2000 and 2010 ARDA surveys after excluding adherents to non-Judeo-Christian religious groups. We then correlated the recalculated *RELIG* with the measure of *RELIG* used in the analysis. The Pearson correlation coefficient was 0.98 (p-value < .01). We also repeated all our analyses using the recalculated *RELIG* and the results (untabulated) were qualitatively unchanged.

[8]Finke and Scheitle (2005) note bias in the year 2000 ARDA data arising from nonparticipation by certain religious groups that is related to race and ethnicity. They propose a correction to the 2000 survey data intended to help mitigate some of this bias, and the 2000 survey file contains their proposed correction. Our results are insensitive as to whether we do or do not use the Finke and Scheitle correction.

[9]Adopting the county as the unit of measurement for our religiosity test variables, while consistent with prior research (e.g., Hilary and Hui 2009), ignores the fact that many of the corporate decision-makers may commute to work from counties outside of the county of the corporate headquarters. Thus, measuring religiosity across a broader geographic unit -- such as the Metropolitan Statistical Area (MSA) -- might provide a more precise measure of the religious norms brought to bear on the corporate decision makers. As a sensitivity test, we determined the counties that are part of each MSA and collapsed the county-level observations into an MSA-level observation by averaging across all counties within the MSA after weighting each county by its population. We then repeated the analysis of tax avoidance after substituting the MSA-level measures for religiosity and demographic characteristics in place of the county level measures. The results (untabulated) were qualitatively unchanged.

[10]We conducted three forms of sensitivity analysis to ensure that our results were not adversely impacted by interpolation First, we correlated the year 2007 state-level rate of religious affiliation (per Pew Forum on Religion and Public Life) with the year 2007 state-level interpolated rate of religious affiliation in our sample. The correlation was 0.73 (p-value < .01). Second, we correlated the mean state-level rate of religious affiliation reported in Table 1 of Hilary and Hui (2009) (covering years 1971-2000) with the mean state-level interpolated rate of religious affiliation in our sample (covering years 1992-2010). The correlation was 0.95 (p-value < .01). Third, we repeated the Table 4 analysis (specification 1 only) using data from years 2000 and 2010 only, wherein *RELIG* is the actual (i.e., not interpolated) value taken directly from the ARDA decennial survey. *RELIG* remained significant in the analysis of *SHELTER*, but lost significance the analysis of *CETR* and *PRED_UTB*. We interpret the insignificance of *RELIG* in the analysis of *CETR* and *PRED_UTB* as due to loss of statistical power arising from the substantial decline in the number of observations (from 33,380 to 3,558 observations). However, we acknowledge that we

et al. 2011) suggests that Protestant and Catholic adherents have different attitudes towards speculative risk, we also decompose *RELIG* into Protestant (*PROTESTANT*) and Catholic (*CATHOLIC*) adherents which are linearly interpolated to obtain values in missing years.[11]

3.1.3 Company-level Control Variables

As noted in the previous section, we control for a set of variables that Chen et al. (2010) report as influencing a firm's tax avoidance activities. We control for firm profitability (*ROA*) and net operating loss carry forwards (*NOL* and *DNOL*) to control for firm's need to avoid income taxes. We also control for firm size (*SIZE*), income from foreign operations (*FI*), leverage (*LEV)*, capital intensity (*PPE* and *INTANG*), growth opportunities (*EQINC*) because prior research suggests that economies of scale and firm complexity are associated with tax avoidance. In addition, we control for CEO risk incentives, measured as the ratio of equity-based compensation to total compensation (*EQ_INCENT*), because Rego and Wilson (2012) show that tax avoidance increases as the CEO is incentivized to take greater risk.

3.2.4 Demographic Control Variables

We also consider the five county-level demographic variables analyzed by Iannaccone (1998) as possible determinants of religious participation at the individual level: age, marital status, urban population, income, and education. These variables are intended to control for potential county-level omitted variables correlated with religiosity (our test variable). More specifically, we consider the median age of the population (*AGE*), the fraction of married people (*MARRIED*) in the county, the fraction of county population living in urban area (*URBAN*), the fraction of county population living in rural area (RURAL), median household income of the county (*INCOME*), and educational attainment

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cannot rule out the possibility that interpolation of *RELIG* may have (somehow) induced a spurious correlation with *CETR* and *PRED_UTB.*

[11]As noted previously (fn. 2), decomposing the religiosity measure into its *PROTESTANT* and *CATHOLIC* components lowers the likelihood of a correlated omitted variable.

(*EDUCATION*) as defined by the fraction of people 25 years and above with at least one year of college.[12] We also include the fraction of Federal Congressional districts within the state that are held by representatives with Republican party affiliation (*POL_ORIENT*) because Christensen and Dhaliwal (2011) find that political orientation is associated with tax avoidance.

3.2 Sample

The process for identifying our sample firms is summarized in Table 1. We begin with 70,769 firm-year observations in Compustat between 1992 and 2010 with total assets greater than $10 million and data available to calculate five-year average cash effective tax rates. We then eliminate observations with insufficient data to calculate our remaining two tax avoidance measures (*SHELTER* and *PRED_UTB*), and the control variables used in our empirical model. Eliminating observations in regulated industries (SIC 4900-4999 and 6000 - 6999) yields a subtotal of 36,883 firm-year observations. We then obtain from Compustat the historical *Company* file which includes both the historical addresses and either firm zip-codes or the Federal Information Processing Standard (FIPS) codes for firms' headquarters and identify the location of corporate headquarters each year[13] Using the historical *Company* file is necessary because the most recent Compustat *Company* file only provides the current location of a firm's headquarters, and then backdates this information to all previous years. We eliminate 269 firm-year observations for which historical data on the location of corporate headquarters is missing and 3,234 observations with a missing value for *RELIG*. Our final sample consists of 33,380 firm-year observations for 4,670 firms.

[Insert Table 1]

[12]Consistent with Loughran and Schultz (2005), we define *URBAN* as 1 if the company headquarters is in one of the ten largest metropolitan areas of the United States, and 0 otherwise; and *RURAL* as 1 if the company headquarters is 100 miles or more from the center of a metropolitan area of one million or more people, and 0 otherwise.

[13]Federal Information Processing Standard codes are 5-digit geographical codes issued by the National Institute of Standards and Technology (NIST), where the first 2 digits identify the state and the last 3-digits identify the county. For example. Kansas' state code is '20' and Crawford County, Kansas has a county code of '037.' Crawford County Kansas therefore has a FIPS code of '20037.' Multiple zip-codes can be associated with a single FIPS code. In some years firm zip-codes are available in the Compustat *Company* file, in other years only FIPS codes are provided. In those years for which only FIPS codes are available, we hand-match FIPS codes to firm zip-codes by locating firm addresses using a Google® search.

3.3 Empirical Results

3.3.1 Descriptive Statistics

Table 2 presents the summary statistics for the variables used in our regression models using the three tax avoidance measures (*CETR, SHELTER,* and *PRED_UTB*). The mean (median) for the five-year average cash effective tax rate (*CETR*) is 32.98% (29.21%), which is consistent with the distributional characteristics for cash ETR's reported in Dyreng et al. (2008). The mean (median) propensity to engage in tax sheltering (*SHELTER*) is 0.281 (0.279) and the corresponding values for predicted unrecognized tax benefits (*PRED_UTB*) are 0.0106 (0.0095). The mean (median) value of religiosity percentage is 53.89 (54.39), consistent with the average levels of religiosity in samples used in prior research such as Kumar et al. (2011). The mean values of *PROTESTANT* and *CATHOLIC* are 22.65% and 26.57%, respectively. The mean firm in our sample is profitable (with an *ROA* of 9.18 percent) and moderately leveraged with a long-term debt to asset ratio of 0.170. Approximately 29 percent of the firm-years in our sample have tax NOLs from prior periods. The median value of foreign income (*FI*) for our sample firms is zero dollars, and the average firm in our sample has about 30.51% of its assets in property plant and equipment (*PPE*) and about 15.05% of its total assets are intangible assets (*INTANG*). The average firm in our sample has a log market value of equity of about 5.97, has a market-to-book ratio of 2.65, and paid its CEO equity-based compensation that constituted 41.34% of his/her total compensation.[14] Approximately 42% of our sample is headquartered in one of the ten largest metropolitan areas of the United States (mean value of *URBAN* 42.41%).

[Insert Table 2]

3.3.2 Correlations

Table 3 present correlations between pairs of variables included in equation (1). As one would expect, tax avoidance measure *CETR* (which decreases with tax avoidance) is negatively correlated with *SHELTER* and *PRED_UTB* (both metrics increase with tax avoidance). However, the correlations are

[14]Note that CEO compensation is available for only 16,710 of the 33,380 observations in our sample because our source of compensation data (Execucomp) reports such data only on the S&P 1500 population of firms.

considerably less than one, suggesting that the different metrics capture different aspects of the tax avoidance construct. The correlations among the firm-specific control variables are relatively low, ranging from -0.27 to 0.32, as are the correlations between the control variables and the test variables *RELIG, PROTESTANT* and *CATHOLIC*. As one might expect, the five county-level demographic variables exhibit correlations with each other that are larger in magnitude than the correlations among the firm-specific control variables. In general, collinearity of *RELIG, PROTESTANT* and *CATHOLIC* with the control variables is not likely to be a significant issue in the multiple regressions.[15]

[Insert Table 3]

3.3.3 Pooled Regression Results

Table 4 presents the results of estimating alternative specifications of equation (1) for each of the three different measures of tax avoidance as dependent variables.[16] Specification (1) includes *RELIG* as the test variable but all control variables except *EQ_INCENT*. Specification (2) is the same as specification (1) but augmented with *EQ_INCENT*. Specification (3) is the same as specification (1) except that the test variable *RELIG* is replaced with its *PROTESTANT* and *CATHOLIC* component variables. We include industry fixed effects (based on the Fama-French 48 industry classification) but do not report their coefficients for brevity. To avoid a mechanical association with the dependent variables, *SHELTER* and *PRED_UTB*, we omit firm-specific control variables (e.g.., *ROA, LEV, FI, SIZE, MB*) used to construct *SHELTER* and *PRED_UTB*. The tests of significance reported in Table 4 are based on robust standard errors that are clustered at the firm- and year-level (Gow et al. 2010).

[Insert Table 4]

The explanatory power of equation (1) for the three dependent variables ranges from 0.063 to 0.432. The coefficient loadings on the firm-level control variables are generally consistent with prior

[15]We confirmed this by examining the condition indicies of the data matrix for each model, and in all instances the condition index was well below the threshold of 20 that Belsley et al. (1980) suggest as indicative of a multicollinearity problem.

[16]Results are insensitive as to whether loss firms are included or excluded.

research. Moreover, several county-level, demographic variables are associated with one or more of the tax avoidance dependent variables. In general, firms headquartered in urban areas (*URBAN*) exhibit lower tax avoidance, while firms headquartered in more affluent areas (*INCOME*) and more Republican areas (*POL_ORIENT*) exhibit greater tax avoidance.

For our Hypothesis 1, we are primarily interested in the coefficient on our test variable *RELIG*. For the cash effective tax rate (*CETR*) dependent variable, the positive and statistically significant coefficient on *RELIG* indicates that firms headquartered in counties that are more religious report higher cash effective tax rates, i.e., avoid fewer taxes. Similarly, for the *SHELTER* and *PRED_UTB* dependent variables, the negative and statistically significant coefficient on *RELIG* indicates that firms headquartered in counties that are more religious report a lower propensity to shelter taxes and lower unrecognized tax benefits, respectively, i.e., avoid fewer taxes. Our results are also economically significant. For example, for the average firm, a one standard deviation increase in the *RELIG* variable increases the mean cash effective tax rate from 32.98% to 33.46% and decreases the mean *PRED_UTB* from 1.06% to 1.04% of total assets.[17]

Table 4 reports the results of estimating specification (3), which allows the coefficient for *RELIG* to differ between its Protestant and Catholic components. In the analysis of *CETR* and *SHELTER*, *PROTESTANT* is not significant while *CATHOLIC* is significant with a negative sign. In the analysis of *PRED_UTB*, both PROTESTANT and CATHOLIC are significant with a negative sign. The coefficients for *PROTESTANT* and *CATHOLIC* are significantly different from each other in the analysis of *SHELTER* and *PRED_UTB* at $p < .01$ (untabulated), but are not significantly different from each other in the analysis of *CETR* ($p = .202$, untabulated). These findings do *not* suggest that Protestants are *more* risk averse (i.e., *less* likely to avoid taxes) as implied by Shu et al. (2011) in their study of Protestant and

[17]The standard deviation of the religiosity variable of .1126 multiplied by the coefficient for the *RELIG* variable in Table 4 of 0.043 yields an increase in *CETR* of .0048. Adding the 0.48% to the mean cash effective tax rate of 32.98% (as reported in Table 2) yields 33.46%. A comparable computation yields the decrease in *PRED_UTB* reported above. We do not report a similar computation for *SHELTER* because it is less easily interpreted (i.e., it is the fitted value of a logit model and hence represents the log-odds of engaging in sheltering activity.)

Catholic beliefs and mutual fund behavior.[18] Rather, our results suggest that Catholics (not Protestants) are less likely to avoid taxes. These findings are consistent with our second perspective on religiosity linked to moral restraint (rather than the first perspective of religiosity linked to risk aversion), i.e., our findings are related to the notion -- discussed by Curran (1985) and USCatholic.org (2012) -- that Catholics tend to view taxes as a moral obligation in support of the poor and are thus less likely to engage in tax avoidance behavior relative to Protestants.

4. Individual Tax Avoidance Tests

In this section, we address our hypothesis H2, which tests the impact of religiosity on tax avoidance by individual taxpayers. Our approach is similar in spirit to that of Brown et al. (2006), who compare state-wide measures of income reported by the Internal Revenue Service to that reported by the Bureau of Economic Analysis.

4.1 Sample

The process used to create the sample used in the test of individual tax compliance is summarized in Table 5, Panel A. We begin by obtaining the annual County Income Data files from the Internal Revenue Service website.[19] Each file contains a record for each county and county equivalent in the U.S., and reports aggregate county totals for number of returns, number of personal exemptions, adjusted gross income, and selected other income totals. Data were available for 2005-2009. Next, for each U.S. county, we obtained from the annual U.S. Census Bureau American Community Survey (ACS) data on aggregate household income and aggregate salary and wage income.[20] According to the Census Bureau, the ACS is a nationwide survey designed to provide communities with demographic, social, economic, and housing data every year for geographic areas with populations of 65,000 or greater (US Census Bureau 2009). Data were available for the period 2005-2010. Finally, we merged the ACS data with the IRS data to

[18]Consistent with Shu et al. (2011), Halek and Eisenhauer (2001) and Kumar et al. (2011) also suggest that Catholics are more tolerant of gambling (speculative risk) than Protestants.

[19]The files are available at http://www.irs.gov/taxstats/article/0,,id=215866,00.html

[20]The files are available at http://www.census.gov/acs/www/

obtain the final sample of 3700 county-years spanning the period 2005-2009. The significant loss in county-years (12,005) occurs because the annual ACS data are available only for counties with populations of 65,000 or more. Hence, our results must be cautiously interpreted because our sample of 3,700 county-years omits less-populated U.S. counties.[21]

[Insert Table 5]

It is important to acknowledge several important limitations associated with the merged ACS and IRS data. The first limitation relates to a difference between the IRS and the ACS in the reference period. The ACS collects data throughout the year on an on-going, monthly basis and asks for a respondent's household income over the past 12 months (US Census Bureau 2009). Thus, the aggregate household income reported in the ACS file is an estimate taken from sampling done throughout the calendar year. In contrast, the IRS data includes summary totals for all individual income tax forms processed through Cycle 39 (the 39th week in the IRS's processing year) which is in late September. The returns cover the tax filing units -- the filer and spouse (if any), plus all exemptions represented on the forms. Returns processed after the Cycle 39 cutoff date are not included in the data. According to the IRS, the data usually contain about 95 to 98 percent of all returns filed during any particular tax year. Thus, the Cycle 39 cutoff will yield aggregate county-wide adjusted gross income numbers that understate the actual county-wide income. In turn, this will yield an upward bias in our measure of unreported income (discussed below).

The second limitation relates to differences in the definition of income between the two datasets. As we describe in greater detail below, we base our analysis on county-wide aggregate adjusted gross income reported to the IRS as compared to county-wide aggregate household income reported in ACS. These two definitions of income are different. Aggregate ACS household income includes all income (whether taxable or tax-exempt), whereas IRS adjusted gross income omits tax-exempt income and

[21]Table 5 Panel A shows that our sample consists of data on 757 counties across the five year period ended in year 2009. Of these 757 counties, only 697 counties appear in all years of the sample. As a result, it is possible that across-time changes in the sample composition are driving our results. To eliminate this possibility, we repeated the Table 6 analyses using data on the 697 counties. Estimation results (not tabulated) were qualitatively unchanged from those reported in Table 6.

includes certain deductions (e.g., moving expenses) not offset against ACS gross income. We deal with this problem in two ways. First, our robustness tests include supplemental analysis intended to probe the sensitivity of our results to differences in gross income definitions.[22] Second, we also include an analysis of IRS versus ACS wages and salary income. The advantage of examining wages and salary income is that it appears to be defined basically the same between the IRS and ACS. Specifically, the census bureau says "Wage or salary income includes total money earnings received for work performed as an employee during the past 12 months. It includes wages, salary, Armed Forces pay, commissions, tips, piece-rate payments, and cash bonuses earned before deductions were made for taxes, bonds, pensions, union dues, etc." (US Census Bureau 2010, p. 79).

The third limitation relates to differences in the covered population. The IRS data--an aggregation of income reported on filed tax returns--obviously exclude income earned by individuals who are not required to file a tax return. According to the IRS, "there are segments of the population that are not well represented by tax returns [because they have no tax filing obligation]; most notably, the elderly and the poor." As we describe below, we control for differences in the covered population by including in our regression model (discussed below) variables that measure the elderly and poor population within each county. [23]

We have no reason to suspect that the aforementioned data limitations will induce systematic measurement error in our underreported income proxies that would create a spurious correlation with our test variables. In other words, we expect the bias in our measure of unreported income to merely dilute

[22]Specifically, we repeat the analysis on county-year observations where aggregate total household income is below the sample median. The assumption here is that the difference between the ACS versus IRS definitions of income should be minimal in lower income counties (since lower-income households are less likely to have tax-exempt income and deductions for adjusted gross income). Estimation results (not tabulated) were qualitatively unchanged from those reported in Table 6.

[23]It is conceivable that a population group with a common religiosity might readily participate in the census survey but avoid reporting to the IRS for reasons related to their group. For example, illegal immigrants are unlikely to report income to the IRS and they may share a systematic, common religiosity. Thus, immigration status (legal versus illegal) potentially could induce correlated omitted variable bias. To address this issue, we partitioned the data by eliminating counties whose population of foreign nationals (as a fraction of county-wide population) was above the sample median, and repeated the analysis. Estimation results (not tabulated) were qualitatively unchanged from those reported in Table 6.

the power of our tests. However, it is important to acknowledge the limitations and to give due consideration to them when interpreting the test results.

4.2 Empirical Model

To test our hypothesis, we conduct the analysis at both the county-year level and the county-level. Our county-year analysis is based on the following pooled cross-sectional regression equation estimated using ordinary least squares (OLS):

$$TaxAv_{k,t} = \alpha_0 + \beta_1 RELIG_{k,t} + \delta^k DEMO_{k,t} + e_{i,t} \qquad (2)$$

where *TaxAv* is a proxy for tax avoidance in county *k*, *RELIG* is our county-level test variable, and *DEMO* denotes a set of demographic characteristics of the county-year. The definitions of all the variables are provided in Appendix A, panel B. Statistical inferences are based on heteroskedasticity-robust standard errors which are clustered by county and year. Reported results are based on all observations,[24] Each of the variables in equation (2) are county-level demographic measures that are unlikely to exhibit significant across-time change during our 2005-2009 test period. For this reason, as an additional test, we collapse the county-year observations into a single county observation by averaging each variable in equation (2) across all county-year observations within a county. We then use OLS to estimate equation (2) from these county-level data and base our statistical inferences on the OLS standard errors.

4.2.1. Dependent Variable

We develop two proxies for tax avoidance from the merged IRS and ACS data. Our first proxy for tax avoidance is the extent of adjusted gross income underreported from individual tax returns filed with the IRS from within the county (*UNDERREPORTED1*). It is calculated by subtracting the aggregate county-wide adjusted gross income (per the Internal Revenue Service) from the aggregate county-wide household income (per the U.S. Census Bureau annual American Community Services survey), and scaling the difference by the ACS survey estimate of aggregate county-wide household income. Thus,

[24]Our inferences remain the same when we estimate equation (2) by eliminating observations with a studentized residual greater than the absolute value of 3.

variable *UNDERREPORTED1* yields an estimate of the fraction of adjusted gross income omitted from the individual tax returns filed within the county. As an example, the IRS data show that taxpayers in Dallas County, Texas filed individual tax returns in tax year 2005 with an aggregate adjusted gross income of $ 43,771,073,000 while the ACS data show the 2005 aggregate household income in Dallas County, Texas to be $ 50,178,585,200. Thus, for Dallas County in 2005, *UNDERREPORTED1* is 0.128, calculated as ($50,178,585,200 - $43,771,073,000)/$ 50,178,585,200. The value of 0.128 implies that the aggregate county-wide household income exceeded the aggregate adjusted gross income reported on tax returns filed by individuals from within the county by 12.8%, i.e., 12.8% of income was underreported. The higher the variable *UNDERREPORTED1*, the higher the tax avoidance by individual taxpayers in the county.

Our second proxy for tax avoidance is the extent of underreported wage and salary income (*UNDERREPORTED2*). It is calculated by subtracting the aggregate county-wide wage and salary income (per the Internal Revenue Service) from the aggregate county-wide wage and salary income (per the U.S. Census Bureau annual American Community Services survey), and scaling the difference by the ACS survey estimate of aggregate county-wide wage and salary income. The value of *UNDERREPORTED2* for Dallas County in 2005 is 0.159, calculated as (42,788,184,500-35,961,781,000)/ 42,788,184,500.

4.2.2 Test Variable

Once again, our test variable is the level of religiosity (*RELIG*) in the county, and is defined the same way as in the analysis of corporate tax avoidance. Specifically, we calculate *RELIG* as the fraction of the county population that claims affiliation with an organized religion (as reported by ARDA in its survey), and linearly interpolate the data to obtain the values for the years 2005-2009. We also decompose *RELIG* into *PROTESTANT* and *CATHOLIC* as done in the corporate analysis.

4.2.3 County-Level Control Variables

The control variables in equation (3) include the six county-level demographic variables discussed previously in our analysis of corporate tax avoidance (i.e., *AGE, MARRIED, URBAN, RURAL,*

INCOME, and *EDUCATION*) and two additional variables *POOR* and *ELDERLY* to capture the extent of the poor and elderly population within a county. Variable *POOR* is the fraction of the county population living in poverty, and *ELDERLY* is the fraction of the county population that is at least 70 years of age. As noted earlier, these variables are included to control for the upward bias in the dependent variables that is likely correlated with the extent of the poor and the elderly in the county population.

All of the variables (except *URBAN* and *RURAL*) are obtained from the annual ACS survey for years 2005-2007. Variables *URBAN* and *RURAL* are calculated (consistent with Loughran and Schultz 2005) based on population estimates obtained from the 2010 decennial census.

4.3 Empirical Results

4.3.1 Descriptive Statistics

Table 5, Panel B reports descriptive statistics for the county-year data used in the test of tax avoidance (underreported income) on individual tax returns. County-level aggregate household income exceeds county-level aggregate income reported to the Internal Revenue Service by 9.37% (mean value of *UNDERREPORTED1*). County-level aggregate wage and salary income exceeded wage and salary income reported to the Internal Revenue Service by 9.03% (mean value of *UNDERREPORTED2).* The maximum values of *UNDERREPORTED1* and *UNDERREPORTED2* are .4251 and .3986. The minimum values of *UNDERREPORTED1* and *UNDERREPORTED2* are -.3196 and -.4338, respectively.[25] Approximately 13% of the population lives in poverty (mean value of *POOR*) and 9.07% of the population is age 70 or above (mean value of *ELDERLY*). We note that values for the other variables are similar to those reported previously in Table 2 (for our analysis of corporate tax avoidance), and so do not discuss them further.

[25] Negative values for *UNDERREPORTED1*and *UNDERREPORTED2* are inconsistent with our prior expectations. We examined the percentile values of the two variables and found that the 1st, 5th, 10th, 90th, 95th, and 99th percentile values for *UNDERREPORTED1* were -.093, -.030, .002, .185, .212, and .265, respectively, and the corresponding values for *UNDERREPORTED2* were -.082, -.015, .013, .169, .196, .249, respectively. Comparing the maximum values to the 90th, 95th and 99th percentile values reveals that the maximum values are similar in magnitude to the upper percentile values. Comparing the minimum values to the 1st, 5th and 10th percentile reveals minimum values that are much larger in magnitude than the lower percentile values. We confirmed the accuracy of these large negative values by manually recalculating the data points using the original source data. Results are not sensitive to whether we exclude or include these extreme-value observations.

4.3.2 Correlations

Panel C of Table 5 presents correlations between pairs of the variables used in our empirical model (2). *UNDERREPORTED1* and *UNDERREPORTED2* are negatively correlated with the variable RELIG, suggesting that on an univariate basis, the higher the religiosity of the county in which the individual taxpayer is located, the lower the percentage of income that is underreported. There is a wide variation in the magnitude of the correlations among the demographic variables. For example, the correlation between the variables *POOR* and *INCOME* is -0.75. By contrast, the correlation between the variables *EDUCATION* and *RURAL* is -0.03. Finally, the correlations between test variable *RELIG* and the eight demographic variables range from -0.06 to 0.10. Comparable correlations for *PROTESTANT* and *CATHOLIC* range from -0.34 to 0.46. In general, collinearity is not likely to be a significant issue in the multiple regressions because the condition index of the data matrix was well below the threshold of 20 that Belsley et al. (1980) suggest as indicative of a multicollinearity problem.

4.3.3 County-Year Regression Results

Table 6 reports the regression results of estimating equation (2) for each of the 3 dependent variables. We report two specifications for each dependent variable -- one with *RELIG* as the test variable, and a second specification with *PROTESTANT* and *CATHOLIC* substituted in place of *RELIG*. Panel A reports the estimates using county-year data, while Panel B reports estimates for equation (2) after collapsing county-year data into a single county-level observation through averaging. As noted earlier, statistical inferences for the county-year model are based on standard errors that control for county and year clustering, while statistical inferences for the county-level analysis are based on OLS standard errors. The regression results are similar between Panels A and B, so our discussion below should be interpreted as relating to both panels unless otherwise noted.

[Insert Table 6]

The explanatory power of equation (2) ranges between 0.100 and .167 (0.153 and 0.258) based on county-year data (county data). The demographic variables *URBAN*, *EDUCATION*, and *POOR* load with positive and statistically significant coefficients, suggesting that underreported income (individual tax

avoidance) is higher in counties that are urbanized, poorer, and more educated. The demographic variable *INCOME* loads with a negative and statistically significant coefficient, suggesting that underreported income is lower in more affluent counties. The remaining control variables generally are not consistently significant.

In specification (1), our test variable *RELIG* loads with a negative and statistically significant coefficient, which suggests that counties with a higher level of religiosity tend to have lower unreported income on the individual tax returns filed from within the county. In terms of economic magnitude, a one standard deviation increase in the religiosity variable *RELIG* results in a decrease in underreported income of 0.89% at the aggregate county level.[26] The comparable values for underreported wages and salary income is 0.57%. [27]

In specification (2), the test variables *PROTESTANT* and *CATHOLIC* each load negative and significant. In all estimations reported in Table 6, the coefficient on *CATHOLIC* is significantly larger ($p < .01$) in magnitude than *PROTESTANT* (untabulated). This is consistent with results obtained in the analysis of corporate tax avoidance that Catholics are less likely to engage in tax avoidance relative to Protestants.

5. Concluding Remarks

Tax avoidance represents risky behavior for both corporate managers and individual taxpayers, because if the IRS is successful in challenging an aggressive tax position there can be substantial costs to pay in the form of interest charges, legal penalties and loss of reputation (if the tax avoidance becomes publicly known). Prior research suggests that religiosity is positively correlated with the individual's aversion to risk (Malinowski 1925; Gaspar and Clore 1998; Hilary and Hui 2009; Miller and Hoffman 1995). Previous research also suggests that religiosity can serve as a social mechanism for inhibiting

[26] Calculated as the standard deviation of the religiosity variable of .1180 (reported in Panel B of Table 5) multiplied by the coefficient for the *RELIG* variable (DV=*UNDERREPORTED1*) from the country-year analysis in Table 6 Panel A of -0.075.

[27] Calculated as the standard deviation of the religiosity variable of .1180 (reported in Panel B of Table 5) multiplied by the coefficient for the *RELIG* variable from the country-year analysis in Table 6 Panel A of -0.048 for DV=*UNDERREPORTED2*.

unethical or opportunistic behavior (Kennedy and Lawton 1998; North 1991; Stulz and Williamson 2003). Other evidence suggests that religiosity at the local (county) level influences local cultural values and norms and consequently affects the decisions of managers and other individuals residing in that county, even if they are not personally religious (Hilary and Hui 2009; Kumar et al. 2011). Altogether, given the role of religiosity in increasing risk aversion and in inhibiting unethical or opportunistic behavior, we predict that religiosity has a restraining influence on tax avoidance by corporate and individual taxpayers.

Consistent with prior research (e.g., Hilary and Hui 2009), we measure religiosity based on the fraction of the local population that claims affiliation with an organized religion in the county in which the firm is headquartered or where the individual taxpayer resides. Our results suggest that firms headquartered (as well as individual taxpayers residing) in more religious counties are associated with less aggressive (i.e., less risky) tax avoidance, whether measured by a firm's cash effective tax rates, tax shelter prediction scores or the estimated amount of unrecognized tax benefits. Our findings complement Dyreng et al. (2010) who show that executives have an incremental effect on corporate tax avoidance behavior that cannot be explained by firm characteristics, i.e., senior executives contribute to the variation in tax avoidance across firms, not necessarily by involving themselves in the tax function but by setting the "tone at the top." Further, our study complements Dyreng et al. (2012) by examining more comprehensively the effects of religiosity on tax avoidance by investigating multiple metrics of corporate tax avoidance. We also examine the relation between religiosity and tax avoidance by individuals, which is an important and under-researched area of the tax avoidance literature. Finally, we decompose the religiosity measures into Protestant and Catholic components. Our study suggests that religiosity may explain the channel by which corporate executives exercise the incremental effect on tax avoidance. Altogether, our study contributes to the broader literature that suggests that religiosity influences corporate and individual decision making.

Appendix A. Definition of Variables

Panel A. Variables used in tests of corporate tax avoidance.

Variable	Description	Source
Dependent variables		
CETR	Long-term cash effective tax rate, calculated as $\frac{\sum_{l=0}^{4} TXPD_{t-l}}{\sum_{l=0}^{4} PI_{t-l} - SPI_{t-l}}$, where TXPD is cash taxes paid, PI is pretax income, and SPI is special items. The *higher* the metric, the *lower* the tax avoidance.	Compustat
SHELTER	Log-odds of engaging in tax sheltering based on the model from Wilson (2009): *SHELTER*=-4.30+6.63**BTD* - 1.72**LEVERAGE* + 0.66**SIZE* + 2.26**ROA* + 1.62**FOREIGN_INCOME* + 1.56**RD*. The *higher* the metric, the *higher* the tax avoidance.	Compustat
PRED_UTB	Predicted unrecognized tax benefits based on the model from Rego and Wilson (2012): *PRED_UTB*= -.004 + .011**ROA* + .001**SIZE* + .010**FOR_SALE* + .092**RD* - .002**DISC_ACCR* + .003**LEV* + .000**MTB* + .014**SGA* + -.018**SALES_GR*. The *higher* the metric, the *higher* the tax avoidance.	Compustat
Test variables		
RELIG	Fraction of corporate headquarters county-wide population that claims affiliation with an organized religion as reported in the 1990, 2000, and 2010 ARDA surveys. *RELIG* in non-survey years determined by linear interpolation.	ARDA Religious Congregations and Membership Study, 2000, 2010. ARDA Churches and Church Membership, 1990.
PROTESTANT	Fraction of corporate headquarters county-wide population that claims affiliation with a Protestant Christian religion as reported in the 1990, 2000, and 2010 ARDA surveys. *PROTESTANT* in non-survey years determined by linear interpolation.	ARDA Religious Congregations and Membership Study, 2000, 2010. ARDA Churches and Church

		Membership, 1990
CATHOLIC	Fraction of corporate headquarters county-wide population that claims affiliation with the Catholic Christian religion as reported in the 1990, 2000, and 2010 ARDA surveys. *CATHOLIC* in non-survey years determined by linear interpolation.	ARDA Religious Congregations and Membership Study, 2000, 2010. ARDA Churches and Church Membership, 1990
Control variables		
ROA	Return on assets, calculated by dividing operating income (PI-XI) by lagged total assets.	Compustat
LEV	Financial leverage, calculated by dividing total long-term debt (DLTT) by current year total assets (AT).	Compustat
NOL	Net operating loss indicator variable =1 if the firm reported a net operating loss carryforward at the end of the prior fiscal year (i.e., lagged TLCF>0) , =0 otherwise.	Compustat
DNOL	Change in net operating loss (TLCF) divided by lagged total assets.	Compustat
FI	Foreign source income (PIFO) divided by lagged total assets.	Compustat
PPE	Net property and equipment (PPENT) divided by lagged total assets.	Compustat
INTANG	Intangible assets (INTAN) divided by lagged total assets.	Compustat
EQINC	Equity in the earnings of unconsolidated subsidiaries (ESUB) divided by lagged total assets.	Compustat
SIZE	Beginning of year common shares (CSHO) outstanding times beginning of year stock price (PRCC_F).	Compustat
MB	Beginning of year market value of equity (CSHO x PRCC_F) divided by beginning of year book value of common equity (CEQ)	Compustat
EQ_INCENT	The fraction of total CEO compensation paid in the form of equity-based compensation (i.e., stock awards and stock options).	Execucomp

AGE	Median age of corporate headquarter county population. *AGE* in non-census years determined by linear interpolation.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
MARRIED	Fraction of the age 15+ corporate headquarter county population currently married. *MARRIED* in non-census years determined by linear interpolation.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
URBAN	Consistent with Loughran and Schultz (2005), =1 if the company headquarters is in one of the ten largest metropolitan areas of the United States according to the last census, =0 otherwise.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
RURAL	Consistent with Loughran and Schultz (2005), =1 if the company headquarters is 100 miles or more from the center of a metropolitan area of one million or more people according to the last census, =0 otherwise.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
INCOME	Median household income in the corporate headquarter county. *INCOME* in non-census years determined by linear interpolation.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
EDUCATION	Fraction of the age 25+ corporate headquarter county population with at least one year of college. *EDUCATION* in non-census years determined by linear interpolation.	U.S. Bureau of Census decennial census for 1990, 2000 and 2010.
POL_ORIENT	The fraction of federal congressional districts (within the county's state) that are held by Republican representatives.	Govtrack.us. Available at http://www.govtrack.us/

Panel B. Variables used in tests of individual tax avoidance

Variable	Description	Source
Dependent variables		
UNDERREPORTED1	Aggregate county-wide household income (per U.S. Census Bureau) less aggregate county-wide adjusted gross income (per U.S. Internal Revenue Service), with the difference deflated by aggregate county-wide household income. The *higher* the metric, the *higher* the tax avoidance.	U.S. Bureau of Census American Community Survey for 2005-2009. Internal Revenue Service County Income Data for 2005-2009.
UNDERREPORTED2	Aggregate county-wide household salary and wage income (per U.S. Census Bureau) less aggregate county-wide salary and wage income (per U.S. Internal Revenue Service), with the difference deflated by the census bureau measure of salary and wage income.	U.S. Bureau of Census American Community Survey for 2005-2009. Internal Revenue Service County Income Data for 2005-2009.
Test variables		
RELIG	Fraction of county-wide population that claims affiliation with an organized religion based on linear interpolation using 2000 and 2010 ARDA Religious Congregations and Membership Study.	ARDA Religious Congregations and Membership Study, 2000 and 2010.
PROTESTANT	Fraction of county-wide population that claims affiliation with a Protestant Christian religion based on linear interpolation using 2000 and 2010 ARDA Religious Congregations and Membership Study.	ARDA Religious Congregations and Membership Study, 2000 and 2010.
CATHOLIC	Fraction of county-wide population that claims affiliation with the Catholic Christian religion based on linear interpolation using 2000 and 2010 ARDA Religious Congregations and Membership Study.	ARDA Religious Congregations and Membership Study, 2000 and 2010.
Control variables		
AGE	Median age of the county population.	U.S. Bureau of Census American Community Survey for 2005-2009.
MARRIED	Fraction of the age 15+ county population currently married.	U.S. Bureau of Census American Community Survey for 2005-2009.

URBAN	Consistent with Loughran and Schultz (2005), =1 if the company headquarters is in one of the ten largest metropolitan areas of the United States according to the 2010 census, =0 otherwise.	U.S. Bureau of Census decennial census for 2010.
RURAL	Consistent with Loughran and Schultz (2005), =1 if the company headquarters is 100 miles or more from the center of a metropolitan area of one million or more people according to the 2010 census, =0 otherwise.	U.S. Bureau of Census decennial census for 2010
INCOME	Median household income in the county.	U.S. Bureau of Census American Community Survey for 2005-2009.
EDUCATION	Fraction of the age 25+ county population with at least one year of college.	U.S. Bureau of Census American Community Survey for 2005-2009.
POOR	Fraction of the county population living in poverty.	U.S. Bureau of Census American Community Survey for 2005-2009.
ELDERLY	Fraction of the county population of age 70 and above.	U.S. Bureau of Census American Community Survey for 2005-2009.
POL_ORIENT	The fraction of federal congressional districts within the state that are held by representatives with Republican party affiliation	Govtrack.us. Available at http://www.govtrack.us/

REFERENCES

Alesina, A., and E. Ferrara. 2000. Participation in heterogeneous communities. *Quarterly Journal of Economics* 115(3): 847-904.

Alm, J. 1991. A perspective on the experimental analysis of taxpayer reporting. *The Accounting Review* 66: 577-593.

Anderson, G. 1988. Mr. Smith and the preachers: the economics of religion in the wealth of nations. *Journal of Political Economy* 96: 1066-1088.

Badertscher, B., S. Katz, and S. Rego. 2011. The impact of private equity ownership on portfolio firm's corporate tax planning. Working Paper: University of Notre Dame.

Brown, R., A. Dunbar and A. Pilot. 2006. The feasibility of producing personal income to adjusted income reconciliations by state. BEA working paper WP2006-05.

Chen., S., A. Chen., Q. Cheng,,and T. Shevlin, 2010. Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics* 95: 41-61.

Christensen, D., and D. Dhaliwal. 2011. Managers' personal political orientation and corporate tax avoidance. Ssrn.com/abstract=2003903.

Curran, C. 1985. Just taxation in the Roman Catholic tradition. *Journal of Religious Ethics* 13(1): 113-133.

Desai, M., and D. Dharmapala. 2009. Corporate tax avoidance and firm value. *Review of Economics and Statistics* 91: 537-546.

Desai, M., I. Dyck, and L. Zingales. 2007. Theft and taxes. *Journal of Financial Economics* 84: 591-623.

Dyreng, S., M. Hanlon and E. Maydew. 2008. Long-Run Corporate Tax Avoidance. *The Accounting Review* 83: 61-82.

Dyreng, S., M. Hanlon and E. Maydew. 2010. The effects of executives on corporate tax avoidance. *The Accounting Review* 85: 1163-1189.

Dyreng, S., W. Mayhew, and C. Williams. 2012. Religious social norms and corporate financial reporting. *Journal of Business Finance and Accounting* 1-31.

Finke, R. and C. Scheitle. 2005. Accounting for the uncounted: Computing correctives for the 2000 RCMS data. *Review of Religious Research*. 47(1): 5-22.

Fischer, C., M. Wartick, and M. Mark. 1992. Detection probability and taxpayer compliance: A review of the literature. *Journal of Accounting Literature* 11: 1-46.

Frank, M., L. Lynch and S. Rego. 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review* 84: 467-496.

Gaspar, K., and G. Clore. 1998. The persistent use of negative affect by anxious individuals to estimate risk. *Journal of Personality and Social Psychology* 5: 1350-1363.

Graham, J., and A. Tucker. 2006. Tax shelters and corporate debt policy. *Journal of Financial Economics* 81: 563-594.

Grasmick, H., and R. Bursick. 1990. Conscience, significant others, and rational choice: extending the deterrence model. *Law and Society Review* 24: 837-861.

Grullon, G., G. Kanatas, and J. Weston. 2010. Religion and corporate behavior. Working paper, Rice University.

Gupta, S., and K. Newberry. 1997. Determinants of the variability in corporate effective tax rates: evidence from longitudinal data. *Journal of Accounting and Public Policy* 16(1): 1-34.

Halek, M., and J. Eisenhauer. 2001. Demography of risk aversion. *Journal of Risk and Insurance* 68: 1-24.

Hanlon, M., 2003. What can we infer about a firm's taxable income from its financial statements? *National Tax Journal* 56, 831-863.

Hanlon, M., and S. Heitzman. 2010. A review of tax research. *Journal of Accounting and Economics* 50: 127-178.

Hilary, G., and K. Hui. 2009. Does religion matter in corporate decision making in America? *Journal of Financial Economics* 93: 455-473.

Hirschi, T., and R. Stark. 1969. Hellfire and delinquency. *Social Problems* 17: 202-213.

Hogg, A., and D. Abrams. 1988. *Social identifications: A Social Psychology of Intergroup Relations and Group Processes.* Routledge.

Hull, B., and F. Bold. 1994. Hell, religion and cultural change. *Journal of Institutional and Theoretical Economics* 150: 447-464.

Iannaccone, L.R., 1998. Introduction to the economics of religion. *Journal of Economic Literature* 36, 1465-1495.

Internal Revenue Service. 2006. IRS updates tax gap estimates. IR-2006-28.

Jackson, B., and V. Milliron. 1986. Tax compliance research: Findings, problems, and prospects. *Journal of Accounting Literature* 5: 125-165.

Kennedy, E., and L. Lawton. 1998. Religiousness and business ethics. *Journal of Business Ethics* 17(2): 163-175.

Kumar, A., J. Page, and O. Spalt. 2011. Religious beliefs, gambling attitudes, and financial market outcomes. *Journal of Financial Economics* 102: 671-708.

Lisowsky, P. 2010. Seeking shelter: Empirically modeling tax shelters using financial statement information. Working paper: University of Illinois.

Loughran, T., and P. Schultz 2005. Liquidity: Urban Versus Rural Firms. *Journal of Financial Economics* 78 341-374.

Malinowski, B. 1925. *Magic, Science and Religion.* NY: Gargen City.

Manzon, G., and G. Plesko. 2002. The relation between financial and tax reporting measures of income. *Tax Law Review* 55: 175-214.

McGuire, S., T. Omer, and N. Sharp. 2012. The impact of religion on financial reporting irregularities. *The Accounting Review* 87: 645-673.

Miller, A., and J. Hoffman. 1995. Risk and religion: An explanation of gender differences in religiosity. *Journal of the Scientific Study of Religion* 34: 63-75.

Mills, L. 1998. Book-tax differences and internal revenue service adjustments. *Journal of Accounting Research* 36: 343-356.

North, D. 1991. Institutions. *Journal of Economic Perspectives* 5(1): 97-112.

Osoba, B. 2003. Risk preferences and the practice of religion: evidence from panel data. Working paper: West Virginia University.

Porcano, T. 1986. Corporate tax rates: progressive, proportional, or progressive. *Journal of the American Taxation Association* 8(1): 17-31.

Rego, S. 2003. Tax-avoidance activities of U.S. multinational corporations. *Contemporary Accounting Research* 20(4): 805-833.

Rego, S., and R. Wilson. 2012. Equity risk incentives and corporate tax aggressiveness. *Journal of Accounting Research* 50(3): 775-810.

Shackelford, D., and T. Shevlin. 2001. Empirical tax research in accounting. *Journal of Accounting and Economics* 31: 321-387.

Shevlin, T. 2007. The future of tax research: From an accounting professor's perspective. *Journal of American Taxation Association* 29(2): 87-93.

Shevlin, T., and S. Porter. 1992. The corporate tax comeback in 1987: some further evidence. *Journal of the American Taxation Association* 14(1): 58-79.

Shu, T., J. Sulaeman, and P. Yeung. 2011. Local religious beliefs and mutual fund risk-taking behaviors. ssrn.com.

Slemrod, J. 1992. *Why People Pay Taxes: Tax Compliance and Enforcement*. Ann Arbor, MI: University of Michigan Pres.

Slemrod, J. 2004. The economics of corporate tax selfishness. *National Tax Journal* 57: 877-899.

Slemrod, J. 2007. Cheating ourselves: The economics of tax evasion. *Journal of Economic Perspectives* (Winter): 25-48.

Stickney, C., and V. McGee. 1982. Effective corporate tax rates: The effect of size, capital intensity, leverage and other factors. *Journal of Accounting and Public Policy* 1: 125-152.

Stulz, R., and R. Williamson. 2003. Culture, openness, and finance. *Journal of Financial Economics* 70: 313-349.

Sunder, S. 2005. Minding our manners: Accounting as social norms. *British Accounting Review* 37: 367-387.

Tajfel, H. 1978. *Differentiation between social groups: Studies in the social psychology of intergroup relations.* Academic Press.

USCatholic.org. 2012. The Tea Party and Catholic social teaching don't mix. *USCatholic.org/teaparty*.

U.S. Census Bureau. 2009. *A Compass for Understanding and Using American Community Survey Data: What Researchers Need to Know* U.S.. Government Printing Office, Washington DC.

Weisbach, D. 2002. Ten truths about tax shelters. Tax Law Review 55:215.

Wilson, R., 2009. An Examination of Corporate Tax Shelter Participants. *The Accounting Review* 84, 969-999.

Wooldridge, J., 2002. Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge.

Zimmerman, J. 1983. Taxes and firm size. *Journal of Accounting and Economics* 5: 119-149.

Table 1. Sample Formation (Analysis of Corporate Tax Avoidance)

Firm-year observations in Compustat with total assets>$10 million 1992-2010 and data available to calculate 5-year average effective tax rates.	70,769	*
Insufficient data to calculate *SHELTER*	-12,418	**
Insufficient data to calculate *PRED_UTB*	-15,207	***
Missing data on control variables	-474	
Subtotal	42,670	
Exclude regulated industries (SIC 4900-4999, 6000-6999)	-5,787	
Subtotal	36,883	
Missing location of home office	-269	
Missing *RELIG*	-3,234	
	33,380	****

* excludes 9,042 observations in which the denominator of *CETR* is <0

** the primary missing value relates to Compustat TXFED

*** the primary missing values relate to Compustat PRCC_F, CSHO, and PPEGT. Also, 3,615 observations lost due to fewer than 15 observations within the industry-year when estimating discretionary accrual model. Discretionary accruals are used in determining *PRED_UTB*

**** relates to 4,670 firms

Table 2. Descriptive Statistics--Variables Used in Test of Corporate Tax Avoidance

	N	Mean	Median	Std	Min	Max
CETR	33380	0.3298	0.2921	0.3188	-0.0865	2.4757
SHELTER	33380	0.2819	0.2790	1.6069	-3.6967	4.2215
PRED_UTB	33380	0.0106	0.0095	0.0077	-0.0051	0.0346
RELIG	33380	0.5389	0.5439	0.1126	0.2933	0.7969
PROTESTANT	33380	0.2265	0.1855	0.1301	0.0778	0.6377
CATHOLIC	33380	0.2657	0.2544	0.1422	0.0132	0.5691
ROA	33380	0.0918	0.0872	0.1190	-0.2680	0.4552
LEV	33380	0.1700	0.1348	0.1692	0.0000	0.7177
NOL	33380	0.2910	0.0000	0.4542	0.0000	1.0000
DNOL	33380	0.0038	0.0000	0.0446	-0.1675	0.2453
FI	33380	0.0146	0.0000	0.0331	-0.0465	0.1649
PPE	33380	0.3051	0.2405	0.2399	0.0173	1.1211
INTANG	33380	0.1505	0.0667	0.1994	0.0000	0.9225
EQINC	33380	0.0007	0.0000	0.0037	-0.0074	0.0254
SIZE	33380	5.9753	5.9413	1.9888	1.8604	11.1020
MB	33380	2.6556	1.9744	2.5298	-1.7884	16.0890
EQ_INCENT	16710	0.4134	0.4423	0.2850	0.0000	0.9469
AGE	33380	35.4343	35.3000	2.5523	30.0767	43.0000
MARRIED	33380	0.5361	0.5409	0.0604	0.3598	0.6585
URBAN	33380	0.4241	0.0000	0.4942	0.0000	1.0000
RURAL	33380	0.0769	0.0000	0.2665	0.0000	1.0000
INCOME	33380	58702.6200	54687.0000	13193.7800	36329.5000	92439.2000
EDUCATION	33380	0.5276	0.5229	0.0912	0.3018	0.7278
POL_ORIENT	33380	0.4522	0.4383	0.1881	0.0000	1.0000

Notes:
See Appendix for variable definitions.

Table 3. Correlation Matrix--Variables Used in Test of Corporate Tax Avoidance

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	*CETR*	1.00																							
2	*SHELTER*	-0.15	1.00																						
3	*PRED_UTB*	-0.03	0.26	1.00																					
4	*RELIG*	0.03	0.02	-0.07	1.00																				
5	*PROTESTANT*	0.02	-0.05	-0.29	0.13	1.00																			
6	*CATHOLIC*	0.01	0.03	0.18	0.55	-0.71	1.00																		
7	*ROA*	-0.12	0.72	0.13	0.00	0.01	-0.01	1.00																	
8	*LEV*	0.01	-0.23	-0.25	0.04	0.13	-0.08	-0.27	1.00																
9	*NOL*	-0.06	-0.03	0.09	-0.03	-0.03	0.01	-0.13	0.07	1.00															
10	*DNOL*	0.04	-0.12	0.02	-0.02	-0.03	0.00	-0.15	0.04	-0.02	1.00														
11	*FI*	-0.09	0.43	0.38	0.00	-0.15	0.11	0.29	-0.11	0.09	-0.03	1.00													
12	*PPE*	-0.06	0.06	-0.33	0.04	0.28	-0.19	0.06	0.26	-0.11	0.00	-0.07	1.00												
13	*INTANG*	-0.04	0.04	-0.06	0.02	-0.08	0.06	-0.05	0.22	0.12	0.06	0.02	-0.31	1.00											
14	*EQINC*	0.00	0.15	-0.02	-0.01	0.02	-0.03	0.05	0.03	0.00	-0.01	0.08	0.09	-0.02	1.00										
15	*SIZE*	-0.13	0.74	0.23	0.02	-0.08	0.05	0.18	0.03	0.04	-0.02	0.32	0.04	0.12	0.16	1.00									
16	*MB*	-0.08	0.38	0.25	-0.02	-0.09	0.04	0.41	-0.08	-0.03	-0.01	0.23	-0.06	0.00	0.03	0.37	1.00								
17	*EQ_INCENT*	-0.10	0.16	0.17	-0.06	-0.11	0.04	-0.02	0.01	0.09	0.02	0.11	-0.06	0.10	0.02	0.29	0.15	1.00							
18	*AGE*	0.01	0.00	0.09	0.16	-0.22	0.29	-0.05	-0.02	0.06	0.02	0.03	-0.19	0.13	0.00	0.02	-0.02	0.01	1.00						
19	*MARRIED*	-0.03	-0.07	0.00	-0.05	0.20	-0.06	0.00	-0.02	-0.02	0.00	-0.06	0.05	-0.09	-0.02	-0.10	-0.02	0.00	0.16	1.00					
20	*URBAN*	0.01	0.04	-0.01	0.39	-0.24	0.39	-0.02	0.00	0.02	0.00	0.07	-0.03	0.08	0.01	0.07	0.00	0.02	-0.15	-0.14	1.00				
21	*RURAL*	0.01	-0.02	-0.11	0.00	0.34	-0.25	0.02	-0.01	-0.06	-0.01	-0.09	0.10	-0.06	-0.01	-0.05	-0.03	-0.08	0.02	0.16	-0.23	1.00			
22	*INCOME*	-0.05	0.06	0.33	0.02	-0.49	0.41	0.00	-0.14	0.07	0.03	0.13	-0.28	0.08	-0.05	0.09	0.11	0.14	0.25	0.31	0.19	-0.26	1.00		
23	*EDUCATION*	-0.04	0.07	0.26	-0.09	-0.31	0.12	0.02	-0.12	0.07	0.01	0.11	-0.22	0.08	-0.05	0.10	0.12	0.12	0.01	-0.11	0.12	-0.24	0.72	1.00	
24	*POL_ORIENT*	0.01	-0.02	-0.21	-0.17	0.43	-0.48	0.03	0.09	-0.06	-0.01	-0.09	0.21	-0.06	0.04	-0.05	-0.04	-0.06	-0.16	0.15	-0.21	0.11	-0.35	-0.25	1.00

Notes:
See Appendix for variable definitions. Correlations of 0.009, 0.011, and 0.015 are significant at the 0.10, 0.05, and 0.01 levels, respectively (n=33,380).

Table 4. Tests of Corporate Tax Avoidance (all years with interpolation of RELIG)

	DV=*CETR*			DV=*SHELTER*			DV=*PRED_UTB*		
	(1)	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
Intercept	0.547***	0.444***	0.548***	0.424**	0.552***	0.490***	0.017***	0.014***	0.017***
	(13.43)	(9.42)	(13.48)	(2.49)	(2.61)	(2.87)	(23.75)	(13.91)	(23.40)
RELIG	0.043**	0.040**		-0.353***	-0.096		-0.002***	-0.001***	
	(2.42)	(2.11)		(-4.51)	(-0.99)		(-4.59)	(-2.99)	
PROTESTANT			0.015			0.011			-0.002***
			(0.65)			(0.11)			(-5.35)
CATHOLIC			0.040**			-0.549***			-0.001**
			(1.99)			(-6.12)			(-2.55)
ROA	-0.419***	-0.201***	-0.418***						
	(-18.71)	(-7.48)	(-18.69)						
LEV	-0.045***	0.015	-0.045***						
	(-3.10)	(0.81)	(-3.05)						
NOL	-0.028***	-0.028***	-0.028***	-0.033*	-0.100***	-0.036**	0.001***	0.000***	0.001***
	(-6.43)	(-6.20)	(-6.41)	(-1.87)	(-4.83)	(-2.04)	(11.14)	(4.34)	(11.31)
DNOL	0.387***	0.218***	0.387***	-3.659***	-4.110***	-3.658***	0.004***	0.004***	0.004***
	(5.95)	(2.68)	(5.95)	(-18.40)	(-14.49)	(-18.41)	(4.30)	(2.77)	(4.29)
FI	0.088*	-0.067	0.085*				0.062***	0.054***	0.062***
	(1.73)	(-1.25)	(1.66)				(49.09)	(35.92)	(49.02)
PPE	-0.118***	-0.128***	-0.118***	0.857***	0.665***	0.851***	-0.004***	-0.004***	-0.004***
	(-11.56)	(-10.62)	(-11.54)	(18.70)	(10.83)	(18.56)	(-20.68)	(-13.41)	(-20.55)
INTANG	-0.088***	-0.076***	-0.088***	1.192***	0.473***	1.183***	-0.004***	-0.006***	-0.004***
	(-9.44)	(-7.21)	(-9.45)	(26.92)	(8.86)	(26.74)	(-19.46)	(-19.01)	(-19.28)
EQINC	-0.006	1.002**	-0.007	45.070***	40.803***	44.927***	-0.008	0.009	-0.007
	(-0.02)	(2.06)	(-0.02)	(20.23)	(15.99)	(20.16)	(-0.89)	(0.82)	(-0.81)
SIZE	-0.022***	-0.014***	-0.022***						
	(-19.17)	(-7.89)	(-19.09)						
MB	0.002*	0.001	0.002*	0.238***	0.176***	0.238***			
	(1.88)	(0.82)	(1.88)	(50.29)	(37.04)	(50.18)			
EQ_INCENT		-0.045***			0.465***			0.002***	
		(-5.97)			(13.19)			(12.41)	
AGE	-0.000	0.002*	-0.000	0.006*	0.012***	0.008**	-0.000***	-0.000	-0.000***
	(-0.13)	(1.70)	(-0.03)	(1.68)	(2.82)	(2.22)	(-7.09)	(-0.81)	(-8.14)
MARRIED	0.057	-0.009	0.064	-2.939***	-2.612***	-3.256***	-0.009***	-0.009***	-0.007***
	(1.46)	(-0.22)	(1.49)	(-16.64)	(-11.93)	(-16.85)	(-11.95)	(-8.26)	(-9.02)
URBAN	0.011***	0.006	0.013***	-0.061***	0.026	-0.055***	-0.001***	-0.001***	-0.001***
	(2.58)	(1.35)	(2.94)	(-3.13)	(1.07)	(-2.91)	(-15.18)	(-7.89)	(-16.77)
RURAL	-0.008	-0.014**	-0.006	0.025	0.107***	0.000	-0.000***	-0.000**	-0.000***
	(-1.15)	(-2.01)	(-0.93)	(0.80)	(2.85)	(0.01)	(-3.37)	(-2.31)	(-3.01)
INCOME	-0.000***	-0.000***	-0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(-3.59)	(-2.78)	(-3.63)	(11.49)	(8.01)	(12.87)	(14.70)	(12.72)	(11.83)
EDUCATION	0.046	0.045	0.059*	-0.532***	-0.685***	-0.861***	0.001	-0.001	0.001*
	(1.36)	(1.19)	(1.65)	(-3.49)	(-3.55)	(-5.36)	(0.94)	(-0.62)	(1.93)
POL_ORIENT	-0.029***	-0.002	-0.025**	0.199***	0.248***	0.116**	-0.002***	-0.001***	-0.001***
	(-2.76)	(-0.17)	(-2.36)	(4.34)	(4.17)	(2.43)	(-7.36)	(-4.60)	(-6.63)
N	33380	16710	33380	33380	16710	33380	33380	16710	33380
adj. R-sq	0.073	0.063	0.073	0.241	0.237	0.242	0.373	0.432	0.374

Notes:

The dependent variables are long-term cash effective tax rates (*CETR*), propensity to engage in tax sheltering (*SHELTER*), and predicted unrecognized tax benefits (*PRED_UTB*). The test variables are the rate of religious affiliation (*RELIG*), protestant affiliation (*PROTESTANT*), and Catholic affiliation (*CATHOLIC*). See Appendix for variable definitions.

Estimates reported are obtained from a least squares regression model fitted from pooled, cross-sectional firm-year observations for the periods 1992-2010. Statistical inferences are based on standard errors adjusted for firm and year clustering (Gow et al. 2010). Each model includes an intercept and industry dummy variables, which are not tabulated for brevity. Each column reports the coefficient estimate followed by the t-statistic in parentheses.

*, **, and *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Significance levels are based on two-tailed tests.

Table 5. Sample Formation, Descriptive Statistics, and Correlations--Individual Taxpayer Analysis

Panel A. Sample Formation

Number of county-years 2005-2009 with county-level totals for AGI and salary/wage income	15,705
Exclude county-years without household income estimates from U.S. Census Bureau annual American Community Surveys	-12,005
Final sample of county-years (757 counties)*	3,700

*Data were available for 731, 735, 742, 742, and 750 counties for the years 2005-2009, respectively.

Panel B. Descriptive Statistics

	N	Mean	Median	Std	Min	Max
UNDERREPORTED1	3700	0.0937	0.0947	0.0750	-0.3196	0.4251
UNDERREPORTED2	3700	0.0903	0.0916	0.0667	-0.4338	0.3986
RELIG	3700	0.4740	0.4700	0.1180	0.2277	0.9085
PROTESTANT	3700	0.2882	0.2634	0.1422	0.0552	0.8921
CATHOLIC	3700	0.1634	0.1381	0.1242	0.0000	0.5938
AGE	3700	36.9204	37.2000	3.9013	23.2000	55.5000
MARRIED	3700	0.5427	0.5463	0.0553	0.3186	0.7021
URBAN	3700	0.1341	0.0000	0.3408	0.0000	1.0000
RURAL	3700	0.2619	0.0000	0.4397	0.0000	1.0000
INCOME	3700	50418.1900	47505.0000	12905.5800	23545.0000	114204.0000
EDUCATION	3700	0.4832	0.4765	0.1004	0.2430	0.8009
POOR	3700	0.1291	0.1261	0.0526	0.0124	0.4446
ELDERLY	3700	0.0907	0.0879	0.0280	0.0269	0.2620
POL_ORIENT	3700	0.4970	0.5294	0.2110	0.0000	1.0000

Panel C. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 *UNDERREPORTED1*	1.00													
2 *UNDERREPORTED2*	0.72	1.00												
3 *RELIG*	-0.11	-0.09	1.00											
4 *PROTESTANT*	0.09	0.00	0.51	1.00										
5 *CATHOLIC*	-0.23	-0.12	0.31	-0.64	1.00									
6 *AGE*	-0.02	-0.02	-0.04	-0.16	0.15	1.00								
7 *MARRIED*	-0.14	-0.08	0.03	0.20	-0.11	0.26	1.00							
8 *URBAN*	-0.08	0.01	0.10	-0.19	0.24	-0.07	0.02	1.00						
9 *RURAL*	0.08	0.06	0.08	0.17	-0.10	-0.14	-0.04	-0.23	1.00					
10 *INCOME*	-0.27	0.00	-0.04	-0.34	0.33	0.05	0.29	0.46	-0.29	1.00				
11 *EDUCATION*	-0.13	0.23	-0.06	-0.21	0.14	-0.16	-0.09	0.17	-0.03	0.63	1.00			
12 *POOR*	0.33	0.04	0.03	0.18	-0.20	-0.34	-0.52	-0.24	0.26	-0.75	-0.39	1.00		
13 *ELDERLY*	0.07	0.01	0.01	-0.06	0.09	0.75	0.03	-0.24	0.02	-0.33	-0.32	0.06	1.00	
14 *POL_ORIENT*	0.00	0.01	0.10	0.46	-0.42	-0.15	0.18	-0.08	0.04	-0.24	-0.14	0.13	-0.07	1.00

Note:
In Panel C, correlations of 0.027, 0.032, and 0.042 are significant at the 0.10, 0.05, and 0.01 levels, respectively (n=3,700).

Table 6. Tests of Underreported Income (individual taxpayer analysis)

Panel A. County-Year Analysis

	DV=*UNDERREPORTED1*		DV=*UNDERREPORTED2*	
	(1)	**(2)**	**(1)**	**(2)**
Intercept	-0.086**	-0.061*	-0.054*	-0.035
	(-2.51)	(-1.82)	(-1.79)	(-1.16)
RELIG	-0.075***		-0.048***	
	(-7.33)		(-5.44)	
PROTESTANT		-0.043***		-0.041***
		(-3.67)		(-3.96)
CATHOLIC		-0.165***		-0.108***
		(-13.78)		(-9.94)
AGE	0.003***	0.003***	0.001	0.000
	(5.07)	(4.73)	(1.16)	(0.80)
MARRIED	0.108***	0.059*	0.064**	0.041
	(3.36)	(1.83)	(2.11)	(1.32)
URBAN	0.012***	0.014***	0.018***	0.019***
	(3.08)	(3.68)	(4.98)	(5.39)
RURAL	-0.000	0.000	0.003	0.004
	(-0.08)	(0.14)	(1.09)	(1.33)
INCOME	-0.000***	-0.000	-0.000***	-0.000***
	(-3.00)	(-0.89)	(-4.89)	(-3.76)
EDUCATION	0.059***	0.037**	0.275***	0.262***
	(3.14)	(2.00)	(15.03)	(14.33)
POOR	0.565***	0.556***	0.111**	0.103**
	(9.99)	(10.41)	(2.07)	(1.97)
ELDERLY	-0.240***	-0.115	0.137*	0.211***
	(-2.60)	(-1.25)	(1.71)	(2.59)
POL_ORIENT	-0.018***	-0.040***	0.007	-0.005
	(-2.71)	(-5.87)	(1.16)	(-0.79)
N	3700	3700	3700	3700
adj. R-sq	0.140	0.167	0.100	0.114

Table 6. Tests of Underreported Income (individual taxpayer analysis)--continued

Panel B. County Analysis

	DV=*UNDERREPORTED1*		DV=*UNDERREPORTED2*	
	(1)	**(2)**	**(1)**	**(2)**
Intercept	0.004	0.034	-0.017	0.008
	(0.08)	(0.59)	(-0.30)	(0.15)
RELIG	-0.077***		-0.052***	
	(-4.78)		(-3.36)	
PROTESTANT		-0.065***		-0.051***
		(-3.45)		(-2.81)
CATHOLIC		-0.138***		-0.102***
		(-6.58)		(-5.02)
AGE	0.003***	0.002**	0.001	0.001
	(2.79)	(2.43)	(0.95)	(0.63)
MARRIED	0.116**	0.073	0.042	0.014
	(2.11)	(1.27)	(0.80)	(0.26)
URBAN	0.023***	0.022***	0.025***	0.024***
	(3.31)	(3.24)	(3.76)	(3.76)
RURAL	-0.004	-0.002	0.000	0.002
	(-0.75)	(-0.50)	(0.10)	(0.33)
INCOME	-0.000***	-0.000***	-0.000***	-0.000***
	(-4.52)	(-3.16)	(-4.71)	(-3.65)
EDUCATION	0.057*	0.033	0.291***	0.274***
	(1.84)	(1.06)	(9.82)	(9.14)
POOR	0.417***	0.408***	0.059	0.050
	(4.97)	(4.91)	(0.73)	(0.63)
ELDERLY	-0.362***	-0.249*	0.076	0.159
	(-2.64)	(-1.79)	(0.58)	(1.19)
POL_ORIENT	-0.006	-0.021*	0.012	0.002
	(-0.55)	(-1.83)	(1.14)	(0.16)
N	757	757	757	757
adj. R-sq	0.239	0.258	0.153	0.168

Notes:
The dependent variables are *UNDERREPORTED1* and *UNDERREPORTED2*. *UNDERREPORTED1* is the fraction of adjusted gross income omitted from individual taxpayer returns filed within the county. *UNDERREPORTED2* is the fraction of wage and salary income omitted from individual taxpayer returns filed within the county. The test variables are the rate of religious affiliation (*RELIG*), protestant affiliation (*PROTESTANT*), and Catholic affiliation (*CATHOLIC*). See Appendix for variable definitions.

Estimates reported in Panel A are obtained from a least squares regression model fitted from cross-sectional county-year observations for the period 2005-2009. These county-year observations are collapsed into a single county observation by averaging each variable across all county-year observations within a county. Estimates reported in Panel B are obtained from a least squares regression model fitted from the mean county observations.

Statistical inferences in Panel A are based on standard errors that are adjusted for county and year clustering (Gow et al. 2010). Statistical inferences in Panel B are based on ordinary least squares standard errors. Reported significance levels are based on two-tailed tests.