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Local Religion and Insider Trading

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ABSTRACT

We examine the effect of local religiosity on managers' financial decisions using insider trading. Managers in more religious counties sell less than those in less religious counties and are granted fewer options. We use the link between higher religiosity and higher levels of risk aversion to explain the results. Managers in more religious counties make fewer unprecedented big sales transactions, which are likely to be made to fund spending on big-ticket items. Firms in more religious counties make fewer option grants in order not to increase their managers' risk appetite, and those managers sell less as a result.

JEL Classification: G14, G19

Keywords: insider trading, local religion, risk aversion

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I. INTRODUCTION

How does local religion influence managers' financial decisions and risk-taking behavior? We know that culture plays a considerable role in shaping economic decisions (e.g., Eun et al., 2015; Karolyi, 2016), and many studies use religion as a common proxy for culture to determine culture's impact on economic and financial behavior (e.g., Stulz and Williamson, 2003; Hilary and Hui, 2009; Kumar et al., 2011, Ucar, 2016). Despite the importance of local religion, to the best of our knowledge, there have been only a few attempts in the literature to directly examine how it affects managerial behavior. A notable exception is Grullon et al. (2009), who examine the effect of local culture on managerial misbehavior and find that higher local religiosity results in fewer undesirable behaviors such as "securities fraud lawsuits filed against the firm, aggressive earnings manipulation, option backdating, and seemingly excessive executive compensation." Another one is Hilary and Hui (2009), who use the link between individual religiosity and risk aversion to show that firms in more religious counties have lower degrees of risk exposure as measured by the variability of their equity returns and returns on assets.

There are only a few managerial behaviors that are as directly observable as legal insider trading. As of August 29, 2002, the U.S. Securities and Exchange Commission (SEC) requires managers of public companies to report their transactions in company securities within two calendar days using SEC Form 4 filings[1]. Moreover, managers truly have skin-in-the-game in these transactions, as it is their own money on the line, which means they get to win or lose personally, depending on the outcome. Not surprisingly, investors pay more attention to what managers do with their money rather than what they say about their firms' potential when deciding to invest in the firm.

In this study, we leverage the unique advantages of legal insider trading data—in that it is directly observable, personal, and financially significant for the manager--to examine how local religiosity affects managerial financial decisions and risk-taking behavior[2]. Ours is a more direct approach than Hilary and Hui (2009), who infer it from a firm's risk exposure since managers stand to personally gain or lose from these trades. We argue it is worthwhile to uncover the link between insider trading and local religiosity, if any, because if local religiosity is indeed influencing managers' decisions regarding their own money, then the same could be true for their decisions involving the firm where much greater sums are at stake. We find that local religiosity influences managers' personal portfolio decisions. Managers of firms located in more religious counties tend to sell less, whereas their buying behavior is unaffected, compared to managers of firms in less religious counties. A concurrent study by Contreras, Korczak and Korczak (2023) examines insider trading profits instead, and finds insiders receive lower profits on their purchase transactions in more religious areas. We consider two possible explanations for our results: opportunism, and risk aversion.

First, to the extent that insider selling is motivated by opportunism, one can argue that higher religiosity would make managers' opportunistic exploitation of private information about the true value of the firm less likely, since there is evidence that higher religiosity discourages unethical corporate behavior (Grullon et al., 2009). To test this, we looked at insider selling right before big monthly drops in stock price, conjecturing that managers in more religious counties would either not increase sales before a bad month, or at least increase them less than managers in less religious counties. On the contrary, managers in both more religious and less religious counties significantly

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increase their sales during the current quarter if there is a market-adjusted monthly return of -10% or less in the following quarter. Moreover, there is no discernible difference between the two groups in how much they increase sales. Therefore, we rule out the opportunism explanation.

Second, we consider a risk aversion explanation. Higher religiosity is typically associated with higher risk aversion (Noussair, Trautmann, van de Kuilen, and Vellekoop, 2013). Consistent with risk-averse behavior, religious people tend to be more frugal; they spend less and save more. Renneboog and Spaenjers (2012) use Dutch survey data and find that religious households are more likely to save, have a stronger bequest motive, and have a longer planning horizon. Using both field and laboratory data, Kurt, Inman, and Gino (2018) find that grocery spending decreases with religiosity. They also find shoppers living in more religious counties make fewer impulse purchases than those living in less religious counties. Both frugality and improved impulse control are examples of risk-averse behavior. To the extent managers sell shares to fund their spending, higher religiosity might lead to less selling since spending tends to decline with religiosity. To see if this is really the case, we focus on significant, unprecedented insider sales, conjecturing that they are likely to be made to fund spending on big-ticket items. Both the frequency and the magnitude of such sales are significantly less in more religious counties than in less religious counties, supporting the idea that risk aversion might be a motive in managers not selling as much in more religious counties.

Another support for the risk aversion explanation comes from stock option grants. In a recent paper examining the effect of stock options on risk aversion, Heron and Lie (2017) find that option grants increase managers' risk appetite. This suggests that firms located in more religious counties would make fewer option grants to their executives since they would not want them to have a higher risk appetite. This, in turn, might lead to fewer insider sales. We look at the average frequency of option grants per insider and find that firms in more religious counties make significantly fewer option grants, and as a result, managers have reduced sales. On the other hand, firms in less religious counties make more option grants, and managers concurrently increase their insider sales.

Furthermore, there is evidence that Catholics are less risk-averse when it comes to financial risks than Protestants (Noussair et al. (2013)). We add county-level Catholic to Protestant ratio to our model to see whether this difference in risk aversion affects the observed trading behavior. We find that after controlling for the level of religiosity, a higher Catholic to Protestant ratio results in more frequent option grants and subsequently increased sales and decreased purchases, in line with the risk aversion explanation.

Our study fits into the growing body of literature that examines the impact of local religion on the financial decisions of managers and investors. For example, Kumar (2009) shows that retail investors from areas with a certain local religion have a higher likelihood of owning lottery-type stocks. Grullon et al. (2009) investigate the link between the local religion of firm locations and the likelihood of backdating options, earnings management, and becoming targets of class action securities lawsuits. Kumar et al. (2011) use religious affiliation as a proxy for gambling propensity by following previous studies and examine the impact of local religion on investors' portfolio choices, as well as firms' corporate decisions, and stock returns. Shu et al. (2012) show the link between the local religion of mutual funds and their investments by examining the levels of risk-taking and sensation-seeking. McGuire et al. (2012) highlight the relationship between local religion and financial reporting irregularities. Ucar (2016) finds a local clientele effect consistent with

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the geographical variations in risk aversion induced by local religion. Adhikari and Agrawal (2016) demonstrate the relationship between risk-taking tendency induced by the religion of firm location and innovative behavior regarding spending on R&D and quality of patents. We contribute to this literature by examining how local religiosity influences managers' risk-taking behavior when they are using their own money. We conclude that local religion has a strong and lasting effect on managers' portfolio decisions; higher religiosity makes managers sell less through risk-averse behavior. We also find that the presence of big, sophisticated investors around the firm plays a similar role in mitigating risk. Firms located in areas with a high density of such investors engage in fewer risk-promoting behaviors, such as the frequent granting of options.

II. DATA AND SAMPLE

Our sample runs from 1996 through 2016. We require available stock price data in CRSP and accounting data in COMPUSTAT databases. We include firms with share codes 10 and 11 (excluding foreign firms, ADRs, and REITs). We use the county-level religion datasets from the Association of Religion Data Archives (ARDA) to construct our local religion variable.[3] Our local religion variable, *Rel* shows local religiosity of a sample firm's headquarter county. We precisely identify firms' headquarter locations over the sample period by obtaining headquarter addresses from their 10-K, 10-Q, and 8-K filings from SEC Analytics database and then geocoding them to exact latitude and longitude coordinates using Google Maps Application Programming Interface (API). Insider trading data on open market sales, open market purchases, and purchases through option exercises is from the Thomson Reuters Insider Filings database[4]. We define managers as all insiders who are officers, officer-directors, or officer-shareholders[5].

There is an asymmetry between the informational content and motives behind insider sales and purchases. For example, open market sales are more frequent since insiders receive part of their compensation as stock and sell due to liquidity, diversification, and rebalancing reasons. But there are also reasons which limit how aggressively insiders can sell, like vesting restrictions that prevent managers from selling part of their stock and option holdings (Kahl, Liu, and Longstaff (2003)), stock ownership requirements (Cai and Vijh (2007)), and reputational concerns and increased litigation risk (Dai, Parwada, & Zhang, 2015). Open market purchases are less frequent since most managers already receive shares through stock options and grants as part of their compensation. Therefore, any open market purchase is considered a purer signal about the value of the firm, as managers would be most likely to purchase on the open market when they think their stock is undervalued. However, purchases are also subject to restrictions like blackout periods, signaling and reputational concerns, and litigation risk. Finally, applying to both sales and purchases alike, Section 10(b) of the Securities Exchange Act of 1933 and Securities and Exchange Commission (SEC) rule 10(b)-5 prohibit corporate insiders from trading on the basis of material, nonpublic information.

Given the various reasons why managers can and cannot freely buy or sell, it is important to strip away the expected levels of trading given these constraints and uncover their abnormal buying and selling. We use several variables shown in the literature to drive insider trading to estimate the normal level of insider trading. We then subtract this estimated normal level of trading from the observed level of trading to reveal the abnormal level of trading.

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We calculate quarterly abnormal open market sales (*QSell*), open market purchases (*QBuy*), and purchases through the exercise of stock options (*QOptBuy*) by running the following manager-level cross-sectional regression following Akbulut (2013):

$$\begin{aligned} Trading_{i,t} = \beta_0 &+ \beta_1 PeerTrading_{i,t} + \beta_2 SelfTrading_{i,t-4} \\ &+ \beta_3 Ownership_{i,t} + \beta_4 Age_{i,t} + \beta_5 Tenure_{i,t} \\ &+ \beta_6 AnalystCoverage_{j,t} + \beta_7 Fraction\_Inst_{j,t} \\ &+ \beta_8 Concentration\_Inst_{j,t} + \beta_9 ShareTurnover_{j,t} \\ &+ \beta_{10} Size_{j,t} + \beta_{11} Past\_RET_{j,t} + \beta_{12} Past\_VOL_{j,t} \\ &+ \beta_{13} \Delta VOL_{j,t} + \varepsilon_{i,t}. \end{aligned} \quad (1)$$

We define the variables as in Akbulut (2013): "*PeerTrading* is the trading activity (open market purchases, open market sales, or purchases through the exercise of options) of a peer insider during the current quarter. Peer insider is matched on firm size (same asset decile), past firm return (return within 10 percent), age (within 5 years), tenure (within 5 years), and the value of shareholdings (nearest dollar value of shareholdings, but within 50 percent) in that order. We require the firm of the peer insider not to be an acquirer or a target in acquisition during quarters t-4 through t+1. *SelfTrading* is the insider's own trading during the same calendar quarter one year ago. *Ownership* is the shares held by the insider divided by the shares outstanding at the beginning of the quarter. *PeerTrading*, *SelfTrading*, and *Ownership* are winsorized at 1%. Age is the number of days since the insider first appeared in the insider data file under any firm. Tenure is the number of days since the insider first appeared in the insider data file under her current firm. *AnalystCoverage* is the number of analysts following the firm from the IBES database. *FractionInst* is the ratio of a firm's shares held by institutional investors relative to the total shares outstanding in CRSP. *FractionInst* is set to 100 percent if it is greater than 100 percent and is measured at the beginning of the current quarter. *ConcentrationInst* is the Herfindahl Index calculated over the distribution of the fractions of company stock owned by institutional investors. *ConcentrationInst* is set to 10,000 if it is greater than 10,000 (the maximum for Herfindahl Index). Data on institutional investors is obtained from CDA/Spectrum, a database of quarterly 13-F filings of money managers to the U.S. Securities and Exchange Commission. *ShareTurnover* is the trading volume in quarter t-1 divided by the shares outstanding at the beginning of quarter t-1 (winsorized at 1%). Size is the log of total assets. *PastRET* is the stock return for the previous four quarters. *Past Volatility* is the annualized volatility of daily stock returns measured over quarters t-4 through t-3. *Change in Volatility* is the difference between volatility measured over quarters t-2 through t-1 and volatility measured over quarters t-4 through t-3".

We run this regression every quarter separately for open market purchases, open market sales, and purchases through the exercise of stock options[6]. Therefore, the dependent variable $Trading_{i,t}$ and the independent variables $PeerTrading_{i,t}$ and $SelfTrading_{i,t-4}$ represent the number of shares acquired through open market purchases, open market sales, or purchases through the exercise of stock options. We express all insider trading related independent variables in Equation (2) as a fraction of the shares outstanding of the firm at the beginning of the quarter to normalize the cross-

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sectional variation in the level of shares outstanding. The residuals from these regressions then represent abnormal insider trading of manager *i* in firm *j* for quarter *t*. Finally, we aggregate the residuals at the firm-quarter level to come up with $QBuy_{j,t}$, $QSell_{j,t}$, and $QOptBuy_{j,t}$ which are quarterly abnormal open market purchases, open market sales and purchases through option exercises for firm *j* in quarter *t*.

Akbulut (2013) notes that calculating abnormal insider trading in this way has several advantages. First, it controls for numerous factors shown to influence insider trading. Second, running quarterly cross-sectional regressions allow the effects of the control variables on insider trading to change over time. And finally, besides controlling for manager, firm, and time-specific factors, our abnormal trading measures also extract information from managerial inaction. The information on managerial inaction is especially valuable because most managers engage in passive insider trading by limiting their purchases (sales) in advance of bad (good) news. For example, Agrawal and Nasser (2012) find that insiders in takeover targets engage in profitable passive insider trading by reducing sales more than they reduce purchases. Hence, using these abnormal insider trading measures has the potential to paint a more comprehensive picture of managerial benefits from insider trading[7].

Table 2 shows the average coefficients from the 84 quarterly cross-sectional insider trading regressions from 1996 to 2016. Most of the coefficients are significant at the 1% level, and although the time period is different, the signs and the magnitudes of coefficients are mostly in line with our expectations and with those reported in Akbulut (2013). For example, there are very strong seasonal and peer effects; the coefficients for past trading one year ago and peer trading in the current quarter are positively significant for all three dependent variables (open market purchases, open market sales, and purchases through option exercises), with extremely high t-statistics. Higher stock ownership, age, and tenure make a manager more likely to sell on the open market. Corporate governance-related variables like analyst coverage and fraction of institutional investors are negatively related to open market purchases, suggesting that higher levels of corporate governance result in decreased open market purchases. As expected, insiders are less likely to buy and are more likely to sell or exercise options if past return is high.

In addition to $QBuy_{j,t}$, $QSell_{j,t}$, and $QOptBuy_{j,t}$, we also create two net purchase variables as follows:

$$QNetBuy_{j,t}=QBuy_{j,t}-QSell_{j,t} \quad (2)$$

and,

$$QOptNetBuy_{j,t}=QBuy_{j,t}+QOptBuy_{j,t}-QSell_{j,t} \quad (3)$$

In our main tests, we present results using all five abnormal trading variables (*QBuy*, *QSell*, *QOptBuy*, *QNetBuy*, and *QOptNetBuy*).

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Table 1

Variable Definitions

Rel: County level religious adherence rate calculated as the total number of adherents of all religious donominations in the county divided by county population. Data comes from the Association of Religion Data Archives' 1990, 2000, and 2010 county-level Religious Congregations and Membership studies. Interim years (1991-99, 2001-2009, 2011-2016) are linearly extrapolated.

CP: County level Catholic to Protestant ratio obtained from Association of Religion Data Archive (ARDA).

LogPop: Logarithm of county population. Annual county population is obtained from National Cancer Institute, which uses

U.S. Census Bureau's annual population estimates at the county-level, separated into 5-year age groups. (https://seer.cancer.gov/popdata/download.html#19)

County65OlderPerc: Percentage of population 65 years and older. Constructed from U.S. Census Bureau's annual county-level estimates by age-groups above.

LogPerCapIncome: Logarithm of county-level per-capita income. County level annual personal income comes from BEA table CAINC1 (https://apps.bea.gov/regional/histdata/releases/1117lapi/index.cfm). Per capita personal income is calculated by dividing county-level per-capita income by county population.

mb: market to book ratio calculated using quarterly COMPUSTAT data items as follows: mb=(cshoq* prccq)/ceqq. Data comes as of the fiscal quarter end immediately preceding beginning of the current quarter minus four months. If cshoq* prccq is missing, then market value of equity is calculated using CRSP data as price times number of shares outstanding.

Size: Log of total assets, quarterly COMPUSTAT data items log (atq), as of the fiscal quarter end immediately preceding beginning of the current quarter minus four months.

Past Return: Stock return during the twelve-month period ending right before the beginning of the current quarter.

Past Volatility: Annualized stock return volatility using daily returns during the two quarters before the current quarter.

Change in Volatility: Annualized stock return volatility using daily returns during three and four quarters before the current quarter.

QSell: Quarterly abnormal open market sales expressed as percentage of firm's shares outstanding. QSell is calculated as the residual from quarterly cross-sectional regressions of total insider sales by all officers on firm and insider-level characteristics to control for normal levels of trading.

QBuy: Quarterly abnormal open market purchases expressed as percentage of firm's shares outstanding, calculated similarly.

QOptBuy: Quarterly abnormal purchases of shares through the exercise of stock options.

QNetBuy: Quarterly net purchases are calculated as QBuy-QSell.

QOptNetBuy: Quarterly net purchases are calculated as QBuy+QOptBuy-QSell.

Firms30dens: Density of firms in a 30-mile radius circle around the firm's headquarters. It is calculated as the number of publicly traded firms within 30 miles from the firm's headquarters location divided by the land area of the 30-mile radius circle around the firm. Firm addresses are obtained from the 10-K, 10-Q and 8-K filings in the SEC Analytics database and then geocoded to exact latitude and longitude coordinates using Google Maps API.

Inst13f30dens: Density of Form 13-F filing investors within 30 miles of the firm. 13-F is filed by filed by institutional investment managers with at least $100 million in equity assets under management. Investor addresses are obtained from the 13-F filings in the SEC Analytics database and then geocoded to exact latitude and longitude coordinates using Google Maps API.

Inst13dg30dens: Density of Form 13-D and 13-G filing investors within 30 miles of the firm. Investor addresses are obtained from the 13-D and 13-G filings in the SEC Analytics database and then geocoded to exact latitude and longitude coordinates using Google Maps API. 13-D must be filed by long-term beneficial owners who own more than 20% of a company, whereas 13- G is for investors who own between 5% to 20% of a company.

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Table 2
Quarterly Cross-Sectional Insider Trading Regressions

	(1) Open Market Purchases		(2) Purchases through Exercise of Options		(3) Open Market Sales	
	Mean	T-stat.	Mean	T-stat.	Mean	T-stat.
Peer Trading in Quarter t	0.0073	5.55***	0.0039	3.37***	0.0291	13.67***
Self-Trading in Quarter t-4	0.3005	23.96***	0.2565	27.31***	0.1769	18.00***
Ownership	0.0364	8.17***	-0.0077	-1.20	0.2773	15.40***
Age	0.0000	9.07***	0.0000	5.31***	0.0001	2.21**
Tenure	-0.0001	-9.51***	0.0001	6.43***	0.0001	7.01***
Analyst Coverage	-0.0050	-6.77***	-0.0063	-3.94***	0.0228	3.83***
Fraction of Inst. Investors	-0.3473	-17.31***	-0.1208	-1.90*	3.4954	15.85***
Concentration of Inst. Investors	0.0000	4.35***	0.0000	-1.11	-0.0005	-5.66***
Share Turnover	-0.0188	-0.70	0.7185	3.78***	3.1485	5.75***
Log Assets	-0.0238	-7.56***	-0.1163	-16.24***	-0.7349	-17.03***
Past Return	-0.1087	-6.95***	0.3116	7.61***	2.1093	13.15***
Volatility	0.2252	6.65***	-0.2460	-3.01***	-1.2236	-4.06***
Change in Volatility	0.1472	5.77***	-0.1425	-2.91***	-0.9840	-4.94***
Intercept	0.0005	12.19***	0.0013	12.57***	0.0049	15.47***
R-Square	4.24%			3.35%		5.27%
Number of Observations	84		84		84	

This table shows the time-series averages of the coefficients from the 84 quarterly regressions of insider trading on control variables from 1996 to 2016. The t-statistics are based on Newey-West (1987) corrected standard errors. Insider trading data is from the Thomson Insiders Database for all managers. The following position codes are used to identify managers: AV, C, CB, CEO, CFO, CI, CO, COO, CT, EVP, GC, GM, GP, H, O, OB, OD, OE, OT, OX, P, SVP, TR, VC, and VP.The dependent variables are open market purchases during quarter t in Column (1), purchases through exercise of options during quarter t in Column (2), and open market sales during quarter t in Column (3), all expressed as a percentage of the shares outstanding at the beginning of the quarter and winsorized at 1 percent level. We define the variables by following Akbulut (2013): "Peer Trading in Quarter t is the trading activity (open market sales for column 1, purchases through the exercise of options for column 2, and open market sales for column 3) of a peer insider during the current quarter. Peer insider is defined as follows: each insider is matched to a peer-based on firm size (same asset decile), past firm return (return within 10 percent), age (within 5 years), tenure (within 5 years), and the value of shareholdings (nearest dollar value of shareholdings, but within 50 percent) in that order. We also require that the firm of the peer insider is not an acquirer or a target in an acquisition during quarters t-4 through t+1. Self-trading in quarter t-4 is insider's trading during the same calendar quarter one year ago. Ownership is the shares held by the insider divided by the shares outstanding at the beginning of the quarter. Peer Trading, Self-Trading, and Ownership are winsorized at the 1 percent level to remove the effects of outliers. Tenure is the number of days since the insider first appeared in the insider data file under his current firm. Age is the number of days since the insider first appeared in the insider data file under any firm. Analyst coverage is from the IBES database and shows the number of analysts following the firm. Fraction denotes the ratio of a firm's shares held by institutional investors relative to the total shares outstanding in CRSP. Concentration is the Herfindahl Index calculated over the distribution of the fractions of company stock owned by institutional investors. Fraction and concentration are measured at the beginning of the current quarter. Fraction is set to 100 percent if it is greater than 100 percent, and Concentration is set to 10,000 if it is greater than 10,000 (the maximum for Herfindahl Index). Data on institutional investors is obtained from CDA/Spectrum, a database of quarterly 13-F filings of money managers to the U.S. Securities and Exchange Commission. Firm size is the log of total assets (log [COMPUSTAT item AT]). Share turnover is the trading volume in quarter t-1 divided by the shares outstanding at the beginning of quarter t-1 (winsorized at 1 percent). Past stock return is the stock return for the previous four quarters. Past stock volatility is the annualized volatility of daily stock returns measured over quarters t-4 through t-3. Change in volatility is the difference between volatility measured over quarters t-2 through t-1 and volatility measured over quarters t-4 through t-3. All independent variables except for Peer Trading and Self Trading are scaled by multiplying by 10-3".

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Table 1 details the calculation of the variables used in the rest of the paper, and Table 3 reports their summary statistics. Insiders are, on average, net buyers. The mean values of *QNetBuy* and *QOptNetBuy* are 0.0005% and 0.0002%, respectively. There is a fair amount of cross-sectional variance in local religiosity; the variable *rel*, which measures the number of religious adherents as a percentage of county population, varies 16 percentage points between its 25th and 75th percentile. Aside from the usual firm-level controls like size, mb past return and volatility, we also include firm-level local controls like local firm and institutional investor densities which measure the number of publicly traded firms and number of institutional investors within 30 miles from the firm's headquarters location divided by the land area of the 30-mile radius circle around the firm. To create these density measures, we extract headquarters addresses for public firms and institutional investors using all their 10-K, 10-Q, 13-F, 13-D and 13-G filings using the SEC Analytics Database over the 1996-2016 period[8]. We then geocode each address to latitude and longitude coordinates using Google Maps API, which results in a highly accurate geo-location of firms from 1996 through 2016 (often at rooftop accuracy). We also include annual county-level local controls such as per capita income, percentage of population aged 65 or older, and county population.

Table 3
Descriptive Statistics

VARIABLES	Mean	Standard Dev.	P25	Median	P75
QSell	-0.0007	0.0344	-0.0150	-0.0066	-0.0013
QBuy	-0.0002	0.0038	-0.0015	-0.0007	-0.0002
QOptBuy	-0.0003	0.0106	-0.0035	-0.0018	-0.0008
QNetBuy	0.0005	0.0347	0.0003	0.0062	0.0158
QOptNetBuy	0.0002	0.0350	-0.0010	0.0045	0.0144
rel	0.520	0.114	0.435	0.522	0.595
mb	2.76	5.73	1.17	1.86	3.13
size	6.307	2.080	4.834	6.293	7.669
past return	0.110	0.536	-0.192	0.062	0.319
past volatility	0.545	0.388	0.298	0.439	0.671
change in volatility	0.000	0.274	-0.091	-0.006	0.079
firms30dens	0.065	0.076	0.010	0.041	0.088
instinv13f30dens	0.062	0.128	0.004	0.014	0.048
instinv13dg30dens	0.052	0.093	0.003	0.014	0.050
logpercapincome	10.662	0.367	10.399	10.632	10.868
county65olderperc	0.122	0.028	0.104	0.120	0.137
logpop	13.620	1.154	13.067	13.709	14.282

This table presents the descriptive statistics for the variables used in the rest of the paper. The first five variables are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales(QOptNetBuy), all of which are the residuals from the quarterly cross sectional regressions in Table 2, and expressed as a % of shares outstanding. Rel is county-level local religiosity (rel). Firm-level variables include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local variables include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Firm-level local variables include the density of firms in a 30-mile radius circle around the firm's headquarters (firms30dens), density of Form 13-F filing investors within 30 miles of the firm (Inst13f30dens), and the density of Form 13-D and 13-G filing investors within 30 miles of the firm (instinv13dg30dens). Variable definitions are provided in Table 1.

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III. MAIN RESULT

We start by regressing quarterly abnormal insider trading measures on local religiosity and firm-level and county-level controls in Table 4. The coefficient for *rel* in Column (1) is -0.00423 and significant at the 1% level, suggesting insiders sell significantly less in more religious counties. Purchases are reduced too, though not as dramatically; the coefficient of rel in Column (2) is -0.00029 and significant at the 5% level. As a result, coefficients of both measures of net purchases, *QNetBuy* and *QOptNetBuy* are positive and significant in Columns (4) and (5), suggesting higher religiosity results in an increase in net purchases, coming mostly from the decline in sales. Not surprisingly, high past return significantly increases sales (t-stat 7.63), reduces purchases (t-stat -5.62), and increases purchases through option exercises (t-stat 6.35). Other local factors influence trading as well: insiders sell significantly more in richer counties, *logpercapincome* has a coefficient of 0.00205 with a t-stat of 3.95, but significantly less in counties with a higher percentage of seniors (county65olderperc has a coefficient of -0.01449 with a t-stat of -2.98).

Table 4
Regressions of Abnormal Insider Trading on Local Religiosity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	QSell	QBuy	QOptBuy	QNetBuy	QOptNetBuy
rel	-0.00423***	-0.00029**	0.00003	0.00394***	0.00397***
	(-3.40)	(-2.17)	(0.09)	(3.12)	(3.23)
logpercapincome	0.00205***	0.00004	0.00024*	-0.00202***	-0.00177***
	(3.95)	(0.73)	(1.75)	(-3.87)	(-3.52)
county65olderperc	-0.01449***	-0.00027	-0.00081	0.01422***	0.01342**
	(-2.98)	(-0.51)	(-0.51)	(2.87)	(2.76)
logpop	0.00024*	0.00002	0.00009*	-0.00022	-0.00014
	(1.86)	(1.61)	(1.95)	(-1.66)	(-1.04)
mb	0.00004	-0.00000**	0.00001	-0.00004*	-0.00003
	(1.68)	(-2.22)	(1.68)	(-1.86)	(-1.58)
size	0.00009	0.00002**	-0.00001	-0.00007	-0.00008
	(0.92)	(2.40)	(-0.36)	(-0.72)	(-0.86)
past return	0.00542***	-0.00022***	0.00036***	-0.00564***	-0.00528***
	(7.63)	(-5.62)	(6.35)	(-7.63)	(-7.38)
past volatiliy	0.00055	0.00018***	0.00026**	-0.00037	-0.00011
	(1.11)	(4.27)	(2.32)	(-0.72)	(-0.24)
change in volatility	0.00062	0.00011**	-0.00008	-0.00052	-0.00060
	(1.53)	(2.19)	(-0.74)	(-1.21)	(-1.53)
intercept	-0.02348***	-0.00084	-0.00416**	0.02264***	0.01848***
	(-4.32)	(-1.51)	(-2.81)	(4.14)	(3.57)
Observations	260,217	260,217	260,217	260,217	260,217
R-squared	0.019	0.009	0.009	0.019	0.016

Dependent variables in Columns 1-5 are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales(QOptNetBuy), all of which are the residuals from the quarterly cross sectional regressions in Table 2, and expressed as a % of shares outstanding. The independent variable of interest is county-level local religiosity (rel). Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using

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Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

In Table 5, we add firm-level local controls. These controls use firms' precise headquarters locations and are measured for the 30-mile radius circle around the firm, so they will vary locally for each firm unless the firms are in the same building or street. We identify the number of public firms and the number of 13-F and 13-DG filers within this 30-mile radius circle and divide it by the land area of the circle to come up with density measures. *Firms30dens* is the public firm density within 30 miles of the firm. We use this to see whether the existence of nearby public firms affects insider trading behavior. One reason why this might matter is that firms might compete to retain local managerial talent and structure their option grants accordingly, which would then influence insider trading. Also, managers might observe the trading behavior of nearby managers and might be influenced by them. *Inst13F30dens* is 13-F filing institutional investor density. These are mostly asset managers, such as mutual funds that manage assets of $100m or more. They typically have large, highly diversified portfolios of hundreds of firms. 13-DG filers own more than 5% of the shares of the firm and are more likely to be hedge funds, activist investors or other big, sophisticated investors. We include these institutional investor density measures to see if the existence of nearby institutional investors has a dampening effect on insider trading through monitoring. We expect 13-DG filers to be more effective monitors than 13-F filers.

Table 5 shows that even after adding these firm-level local controls, which vary by firm location and hence allow a finer location-based variation than county-level local controls, the results are mainly the same. Coefficients of rel and their significance levels in all specifications are virtually identical to those reported earlier. Interestingly, the existence of other public firms around the firm significantly increases sales. The coefficient of *firms30dens* is 0.05767 with a t-stat of 5.8, whereas purchases are reduced; the coefficient of *firms30dens* in Column (2) is -0.00244 with a t-stat of -3.17. Net purchase measures in Columns (5) and (6) show significant declines in net purchases as a result. Perhaps managers feel freer to sell when there are many other firms around since their potentially opportunistic actions would be more difficult to detect by local investors. The sign of active institutional investors (those who file 13-DG forms), on the other hand, is -0.04522 with a t-stat of -5.66 in Column (1), suggesting the existence of many such investors near the firm strongly deters selling activity, consistent with the monitoring interpretation.

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Table 5
Regressions of Abnormal Insider Trading on Local Religiosity with Firm and Investor Density Measures

VARIABLES	(1) QSell	(2) QBuy	(3) QOptBuy	(4) QNetBuy	(5) QOptNetBuy
rel	-0.00388***	-0.00023*	-0.00009	0.00365**	0.00356**
	(-2.99)	(-1.94)	(-0.23)	(2.75)	(2.76)
firms30dens	0.05767***	-0.00244***	0.00245	-0.06012***	-0.05766***
	(5.80)	(-3.17)	(0.94)	(-6.10)	(-5.67)
instinv13f30dens	0.00825**	-0.00028	-0.00074	-0.00853**	-0.00927**
	(2.48)	(-0.91)	(-0.79)	(-2.55)	(-2.89)
instinv13dg30dens	-0.04522***	0.00134	-0.00013	0.04656***	0.04644***
	(-5.66)	(1.68)	(-0.05)	(5.85)	(5.66)
logpercapincome	0.00018	0.00021***	0.00011	0.00003	0.00014
	(0.25)	(2.94)	(0.56)	(0.04)	(0.19)
county65olderperc	-0.01268**	-0.00037	-0.00119	0.01231**	0.01112*
	(-2.37)	(-0.66)	(-0.69)	(2.26)	(2.03)
logpop	-0.00030	0.00005**	0.00003	0.00034*	0.00037*
	(-1.59)	(2.81)	(0.65)	(1.84)	(1.94)
mb	0.00002	-0.00000*	0.00000	-0.00002	-0.00002
	(1.14)	(-1.91)	(0.98)	(-1.30)	(-1.07)
size	0.00009	0.00002*	-0.00000	-0.00007	-0.00007
	(0.90)	(2.00)	(-0.09)	(-0.72)	(-0.79)
past return	0.00561***	-0.00021***	0.00033***	-0.00583***	-0.00550***
	(6.44)	(-5.03)	(5.94)	(-6.44)	(-6.25)
past volatiliy	0.00024	0.00019***	0.00022	-0.00005	0.00017
	(0.38)	(3.69)	(1.66)	(-0.08)	(0.29)
change in volatility	0.00079	0.00007	-0.00008	-0.00072	-0.00080
	(1.57)	(1.25)	(-0.66)	(-1.39)	(-1.70)
intercept	0.00193	-0.00296***	-0.00192	-0.00488	-0.00681
	(0.22)	(-3.55)	(-0.86)	(-0.57)	(-0.80)
Observations	214,420	214,420	214,420	214,420	214,420
R-squared	0.021	0.009	0.009	0.021	0.018

Dependent variables in Columns 1-5 are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales(QOptNetBuy), all of which are the residuals from the quarterly cross sectional regressions in Table 2, and expressed as a % of shares outstanding. The independent variable of interest is county-level local religiosity (rel). Firm-level controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Firm-level local controls include the density of firms in a 30-mile radius circle around the firm's headquarters (firms30dens), the density of Form 13-F filing investors within 30 miles of the firm (Inst13f30dens), and the density of Form 13-D and 13-G filing investors within 30 miles of the firm (instinv13dg30dens). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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IV. IDENTIFICATION

A. Relocating Firms

At this stage, we want to make sure that the effect of local religiosity on insider trading is indeed due to local religion, and not just an artifact of having firms with low selling managers in highly religious counties due to randomness or luck. To ensure it is the local religiosity that is influencing insider trading, we look at firms that relocated to a different county and see whether their insider trading becomes sensitive to the religiosity level of the new county. To avoid mistakenly classifying firms that keep reporting multiple addresses back and forth in their filings over time as movers, we only label firms that changed their headquarters address only once and stayed at the new headquarters address until the end of their existence in the sample, as true movers. We identify 1,416 such firms. Labeling the move year as year 0, we regress insider trading during the three years before the move (years t-1 to t-3) on local religiosity of the current location (*rel*) and the future location (*relother*) in Table 6[9]. We expect the trading to be sensitive to only the current local religiosity, which is what column (1) of Table 6 shows: managers sell significantly less when the current location is more religious, the coefficient of *rel* is -0.01280 with a t-stat of -2.43. Whereas the religiosity of the future location has no effect on current insider sales, the coefficient of *relother* is 0.00359 and insignificant. We repeat the same analysis for the post-move years (years t+1 to t+3) in Table 7 and obtain the same result. In this table, *relother* refers to the local religiosity of the past location. Once again firm's insider trading becomes sensitive to the religiosity of the new location and insensitive to the old location. The coefficient of *rel* in Column (1) is -0.0112 with a t-stat of -2.09, whereas the coefficient of *relother* is practically zero and insignificant. Results in Tables 6 and 7 support the notion that the observed sensitivity of insider trading to local religion is unlikely to be due to having firms with low-selling managers in highly religious counties and firms with high-selling managers in less religious counties due to pure randomness or chance.[10]

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Table 6
Regressions of Abnormal Insider Trading on Local Religiosity for Movers for Pre-Move Years (years -1 through -3)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	QSell	QBuy	QOptBuy	QNetBuy	QOptNetBuy
rel	-0.01280**	-0.00047	0.00324	0.01233**	0.01557**
	(-2.43)	(-0.39)	(1.21)	(2.23)	(2.67)
relother	0.00359	-0.00039	0.00143	-0.00398	-0.00255
	(0.40)	(-0.38)	(0.56)	(-0.43)	(-0.27)
logpercapincome	-0.00368	0.00087**	-0.00124	0.00454	0.00331
	(-1.18)	(2.52)	(-1.63)	(1.44)	(1.10)
county65olderperc	0.02217	-0.00429	-0.00258	-0.02646	-0.02904
	(0.88)	(-1.28)	(-0.30)	(-1.04)	(-1.02)
logpop	0.00080	0.00003	0.00038	-0.00077	-0.00039
	(1.17)	(0.29)	(1.02)	(-1.07)	(-0.75)
mb	0.00029*	-0.00000	0.00006	-0.00029*	-0.00023*
	(1.94)	(-0.06)	(1.47)	(-1.98)	(-1.78)
size	0.00047	-0.00012	0.00002	-0.00058	-0.00056
	(1.22)	(-1.52)	(0.18)	(-1.52)	(-1.42)
past return	0.00402**	-0.00039**	-0.00010	-0.00441***	-0.00451***
	(2.73)	(-2.80)	(-0.23)	(-3.08)	(-3.49)
past volatility	0.00319	-0.00045	0.00073*	-0.00364*	-0.00292
	(1.45)	(-1.21)	(1.78)	(-1.79)	(-1.46)
change in volatility	-0.00250	0.00063**	0.00013	0.00313	0.00326
	(-1.06)	(2.60)	(0.24)	(1.35)	(1.23)
intercept	0.02317	-0.00757*	0.00476	-0.03073	-0.02597
	(0.80)	(-1.87)	(0.65)	(-1.05)	(-0.89)
Observations	4,843	4,843	4,843	4,843	4,843
R-squared	0.151	0.146	0.127	0.153	0.147

This table uses a subsample of firms that moved their headquarters to a different county. The data is restricted to pre-move years, which are years -3 through -1 relative to the move year (year 0). A firm is considered to have moved if it starts reporting its headquarters address in a different county. To obtain a clean movers sample, we include only those firms that change their headquarters address just once during their existence in the main sample. This helps eliminate noise introduced by firms that do not really move but keep changing the reported headquarters address back and forth. It also reduces the confounding effects of firms that move more than once. Rel refers to the religiosity of the firm's current county, whereas relother refers to the religiosity of the county that the firm will move to. The rest of the variables are the same as before and were detailed in Table 1. Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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Table 7
Regressions of Abnormal Insider Trading on Local Religiosity for Movers for Post-Move Years (years +1 through +3)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	QSell	QBuy	QOptBuy	QNetBuy	QOptNetBuy
rel	-0.01120*	0.00076	0.00070	0.01196*	0.01266*
	(-2.09)	(0.87)	(0.38)	(2.08)	(2.01)
relother	-0.00039	0.00024	0.00150	0.00063	0.00213
	(-0.06)	(0.31)	(0.72)	(0.10)	(0.34)
logpercapincome	0.00677**	0.00005	0.00173*	-0.00672**	-0.00499*
	(2.65)	(0.13)	(1.84)	(-2.62)	(-1.93)
county65olderperc	-0.01400	-0.01042***	-0.00399	0.00359	-0.00040
	(-0.65)	(-3.46)	(-0.39)	(0.16)	(-0.02)
logpop	-0.00018	0.00006	-0.00046	0.00025	-0.00021
	(-0.24)	(0.46)	(-1.47)	(0.28)	(-0.27)
mb	-0.00009	-0.00001	0.00004	0.00008	0.00012**
	(-1.53)	(-1.01)	(1.45)	(1.42)	(2.22)
size	0.00049	-0.00006*	0.00000	-0.00056	-0.00055
	(1.46)	(-1.83)	(0.04)	(-1.59)	(-1.63)
past return	0.00254	-0.00043**	0.00079**	-0.00298*	-0.00219
	(1.72)	(-2.34)	(2.62)	(-1.96)	(-1.60)
past volatility	0.00043	0.00001	0.00147***	-0.00041	0.00105
	(0.15)	(0.03)	(3.28)	(-0.14)	(0.35)
change in volatility	0.00102	0.00078**	-0.00140**	-0.00024	-0.00163
	(0.55)	(2.29)	(-2.76)	(-0.12)	(-0.86)
intercept	-0.06771**	-0.00013	-0.01426	0.06758*	0.05332
	(-2.11)	(-0.03)	(-1.63)	(2.01)	(1.57)
Observations	5,484	5,484	5,484	5,484	5,484
R-squared	0.148	0.139	0.129	0.148	0.141

This table uses a subsample of firms that moved their headquarters to a different county. The data is restricted to post-move years, which are years +1 through +3 relative to the move year (year 0). A firm is considered to have moved if it starts reporting its headquarter address in a different county. To obtain a clean movers sample, we include only those firms that change their headquarters address just once during their existence in the main sample. This helps eliminate noise introduced by firms that do not really move but keep changing the reported headquarters address back and forth. It also reduces the confounding effects of firms that move more than once. Rel refers to the religiosity of the firm's current county, whereas relother refers to the religiosity of the county the firm had moved from. The rest of the variables are same as before and were detailed in Table 1. Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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B. Propensity Score Matching Analysis

As a second identification strategy, we use a propensity score matching analysis following the previous studies (e.g., Ucar, 2019.) We use the following firm and local controls as well as year and industry effects in the propensity score estimation: market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility and change in volatility, county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). We identify *High Local Religiosity* firms as the treatment firms and *Low Local Religiosity* firms as the control firms in the propensity score matching. The propensity score matching analysis matches the treated firms with the control firms from the same year and industry, and estimates the propensity score.[11] The analysis uses the nearest neighbor method in matching.[12] We define the sample firms in the highest quartile of local religiosity as *High Local Religi*osity firms and those in the lowest quartile of local religiosity as Low Local Religiosity firms.

Table 8 presents the findings of the propensity score matching. The results support our earlier findings. There are negative and statistically significant differences in the mean values of *QSell* and *QBuy* and positive and statistically significant differences in the mean values *QNetBuy* and *QOptNetBu*y, consistent with Table 4. This table provides additional support for the impact of local religiosity on abnormal insider trading, highlighted in our earlier findings.

C. Instrumental Variable Approach

Finally, we conduct a two-stage least squares (2SLS) analysis with an instrumental variable (IV) approach as an additional identification test. The IV analysis also helps further address endogeneity concerns. Prior literature (e.g., Hilary and Hui, 2009; Adhikari and Agrawal, 2016; Li and Ucar, 2022) uses past religion data as an IV. Prior literature suggests that past religion is a valid and strong IV because one can expect the past local religion data to be correlated with the current local religion while unlikely to be correlated with any current level of omitted variable affecting the current levels of insider trading. Specifically, we use the past local religiosity data from 1971 as an IV. [13]

Table 8
Propensity Score Matching

	N	Treatment	Matched	Difference	t-stat
Panel A. QSell	40,870	-0.00106	0.00098	-0.00204	-4.37***
Panel B. QBuy	40,870	-0.00020	-0.00002	-0.00018	-3.38***
Panel C. QOptBuy	40,870	-0.00014	0.00007	-0.00021	-1.44
Panel D. QNetBuy	40,870	0.00086	-0.00100	0.00186	3.94***
Panel E. QOptNetBuy	40,870	0.00072	-0.00093	0.00165	3.48***

This table presents results from propensity score matching. Firms in the highest (lowest) quartile of local religiosity (rel) are used as treatment (matched) firms. Propensity scores are calculated using a logit model to estimate the likelihood of being a high local religiosity area firm using the following variables: county per capita income (logpercapincome), percentage of county population 65 years and older (county65olderperc), county population (logpop), market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, change in volatility, and year and industry dummies. We further require treated firms and matched firms to be in the same industry and year, consistent with Ucar (2019). We follow a propensity score matching with the nearest neighbor matching method. The propensity scores are estimated using 0.01 caliper as the maximum distance level. The differences in mean values for treatment and matched firms along with differences for QSell, QBuy, QOptBuy,QNetBuy, and QOpyNetBuy are shown in Panels A-E, respectively, along with t-statistics. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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In Table 9, we provide the results of the second stage of the 2SLS analysis with an IV approach for our Table 4 results. Results in Table 9 are consistent with our earlier findings. Similar to our Table 4 results, the coefficient for *QSell* is negative and statistically significant, whereas the coefficients for QNetBuy and *QOptNetBuy* are positive and statistically significant. These findings demonstrate that our findings remain robust after addressing potential endogeneity. Overall, the identification tests provide additional support to our earlier results and highlight the role of local religiosity in managers' financial decisions as proxied by insider trading.

Table 9
Instrumental Variable Analysis of Abnormal Insider Trading on Local Religiosity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	QSell	QBuy	QOptBuy	QNetBuy	QOptNetBuy
rel	-0.00577***	-0.00024	0.00026	0.00554***	0.00579***
	(-3.27)	(-1.25)	(0.46)	(3.13)	(3.44)
logpercapincome	0.00213***	0.00004	0.00023	-0.00209***	-0.00186***
	(4.14)	(0.84)	(1.64)	(-4.04)	(-3.74)
county65olderperc	-0.01365**	-0.00031	-0.00096	0.01334**	0.01238**
	(-2.76)	(-0.58)	(-0.58)	(2.65)	(2.53)
logpop	0.00027*	0.00002	0.00009*	-0.00025*	-0.00016
	(2.02)	(1.49)	(1.89)	(-1.83)	(-1.24)
mb	0.00004*	-0.00000**	0.00001	-0.00004*	-0.00003
	(1.79)	(-2.34)	(1.72)	(-1.98)	(-1.71)
size	0.00008	0.00002**	-0.00001	-0.00006	-0.00007
	(0.82)	(2.53)	(-0.28)	(-0.62)	(-0.74)
past return	0.00542***	-0.00021***	0.00036***	-0.00564***	-0.00528***
	(7.62)	(-5.51)	(6.45)	(-7.62)	(-7.37)
past volatility	0.00053	0.00018***	0.00027**	-0.00035	-0.00008
	(1.06)	(4.28)	(2.33)	(-0.68)	(-0.18)
change in volatility	0.00065	0.00010*	-0.00008	-0.00055	-0.00063
	(1.58)	(2.07)	(-0.72)	(-1.28)	(-1.60)
Observations	257,833	257,833	257,833	257,833	257,833
R-squared	0.019	0.008	0.009	0.019	0.016

This table reports the results of the second stage of the two-stage least squares (2SLS) analysis with an Instrumental Variable (IV) approach. The IV is county-level local religiosity from the 1971 county-level religion dataset provided on the Association of Religion Data Archives (ARDA)'s website. Dependent variables in Columns 1-5 are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales (QOptNetBuy), all of which are the residuals from the quarterly cross-sectional regressions in Table 2 and expressed as a % of shares outstanding. The independent variable of interest is county-level local religiosity (rel). Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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D. What Explains the Results?

1. Opportunism

Why do managers sell less in more religious counties? If high abnormal selling is due to managers' opportunistically using their information advantage to dump shares before the bad news, one might argue managers in more religious counties might refrain from such opportunism as religiosity is supposed to deter such unethical behavior. Another reason is more practical: if religiosity is associated with risk aversion, managers will be less likely to engage in opportunistic trading for fear of legal ramifications. Even if the managers themselves may not be religious, they might still feel tempted to act in accordance with local norms due to fear of losing social capital. To test this, we identify months where firms had a less than -10% market-adjusted return and see whether local religiosity makes a difference in how managers trade before such bad returns. We create a dummy variable called *badmonth10,* which is set to one if there is a month with a market-adjusted return of less than -10% in the next quarter. We then regress abnormal trading during the current quarter on *rel*, *badmonth10* and the interaction of *rel* and *badmonth10* (*rel*badmonth10*). If high local religiosity really deters from opportunistic selling before a bad month, we should see a negative and significant coefficient on the interaction term when we regress abnormal sales on it.

Table 10 shows that managers significantly increase sales before a bad month. The coefficient of *badmonth10* in Column (1) is 0.00064 with a t-stat of 3.06, significant at the 1% level. When we add the interaction term in Column (2), we see that it has the expected negative sign, but the effect is insignificant. So, managers in more religious counties do not seem to be acting less opportunistically when it is their money on the line.

2. Risk Aversion

There is a rich body of evidence suggesting a positive correlation between an individual's religiosity and risk aversion. Miller and Hoffman (1995) find higher individual religiosity makes individuals more averse to risk and danger. Osoba (2003) finds risk-averse individuals attend church more often than risk-seeking individuals. Hilary and Hui (2009) conduct an experiment on 120 undergraduate business students and find that those who attended religious services more often are less likely to accept riskier payouts. Using a representative panel dataset of Dutch population, Noussair et al. (2013) find that higher religiosity is strongly associated with higher risk aversion about financial risks.

But why would higher risk aversion mean lower insider sales? We consider two explanations.

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Table 10
Abnormal Insider Trading Before Bad Months and Local Religiosity

VARIABLES	(1) QSell	(2) QSell	(3) QBuy	(4) QBuy	(5) QOptBuy	(6) QOptBuy	(7) QNetBuy	(8) QNetBuy	(9) QOptNetBuy	(10) QOptNetBuy
badmonth10	0.00064***	0.00110	0.00003	0.00013	0.00013**	0.00006	-0.00061**	-0.00097	-0.00048**	-0.00092
	(3.06)	(1.17)	(1.16)	(1.68)	(2.17)	(0.26)	(-2.83)	(-1.06)	(-2.35)	(-0.99)
rel	-0.00420***	-0.00385**	-0.00029**	-0.00021	0.00004	-0.00002	0.00391***	0.00364**	0.00395***	0.00362**
	(-3.37)	(-2.81)	(-2.17)	(-1.61)	(0.11)	(-0.04)	(3.09)	(2.63)	(3.21)	(2.74)
rel*badmonth10		-0.00089		-0.00020		0.00015		0.00069		0.00084
		(-0.50)		(-1.43)		(0.39)		(0.40)		(0.46)
logpercapincome	0.00204***	0.00205***	0.00004	0.00004	0.00024*	0.00024*	-0.00201***	-0.00201***	-0.00177***	-0.00177***
	(3.94)	(3.95)	(0.72)	(0.73)	(1.74)	(1.73)	(-3.86)	(-3.87)	(-3.51)	(-3.52)
county65olderperc	-0.01438***	-0.01433***	-0.00026	-0.00025	-0.00078	-0.00079	0.01411**	0.01408**	0.01333**	0.01329**
	(-2.96)	(-2.95)	(-0.50)	(-0.48)	(-0.49)	(-0.50)	(2.85)	(2.85)	(2.74)	(2.74)
logpop	0.00024*	0.00024*	0.00002	0.00002	0.00009*	0.00009*	-0.00022	-0.00022	-0.00013	-0.00013
	(1.82)	(1.82)	(1.61)	(1.60)	(1.92)	(1.92)	(-1.63)	(-1.62)	(-1.02)	(-1.01)
mb	0.00004	0.00004	-0.00000**	-0.00000**	0.00001	0.00001	-0.00004*	-0.00004*	-0.00003	-0.00003
	(1.65)	(1.65)	(-2.23)	(-2.23)	(1.67)	(1.67)	(-1.83)	(-1.83)	(-1.56)	(-1.56)
size	0.00010	0.00010	0.00002**	0.00002**	-0.00000	-0.00000	-0.00008	-0.00008	-0.00009	-0.00009
	(1.07)	(1.06)	(2.43)	(2.42)	(-0.21)	(-0.21)	(-0.86)	(-0.86)	(-0.99)	(-0.98)
past return	0.00543***	0.00543***	-0.00022***	-0.00022***	0.00036***	0.00036***	-0.00565***	-0.00565***	-0.00528***	-0.00528***
	(7.61)	(7.61)	(-5.63)	(-5.64)	(6.36)	(6.36)	(-7.62)	(-7.62)	(-7.37)	(-7.37)
past volatility	0.00038	0.00039	0.00017***	0.00017***	0.00023*	0.00023*	-0.00021	-0.00021	0.00002	0.00002
	(0.80)	(0.80)	(4.09)	(4.10)	(2.01)	(2.01)	(-0.42)	(-0.42)	(0.04)	(0.03)
change in volatility	0.00070*	0.00070*	0.00011**	0.00011**	-0.00006	-0.00006	-0.00059	-0.00059	-0.00065	-0.00065
	(1.74)	(1.73)	(2.23)	(2.22)	(-0.59)	(-0.59)	(-1.40)	(-1.39)	(-1.70)	(-1.70)
intercept	-0.02359***	-0.02380***	-0.00085	-0.00090	-0.00418**	-0.00414**	0.02274***	0.02290***	0.01856***	0.01876***
	(-4.34)	(-4.39)	(-1.52)	(-1.60)	(-2.82)	(-2.77)	(4.16)	(4.20)	(3.58)	(3.64)
Observations	260,217	260,217	260,217	260,217	260,217	260,217	260,217	260,217	260,217	260,217
R-squared	0.019	0.019	0.009	0.009	0.009	0.009	0.019	0.019	0.016	0.016

Dependent variables in Columns 1-10 are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales (QOptNetBuy), all of which are the residuals from the quarterly cross-sectional regressions in Table 2, and expressed as a % of shares outstanding. The independent variables of interest are county-level local religiosity (rel), a dummy variable which is set to one if there exists a market-adjusted monthly return of -10% or less in the next quarter (badmonth10), and the interaction of rel and badmonth10. Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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First, there is research showing that higher religiosity is associated with higher saving rates, less spending, and fewer impulse purchases, which are examples of risk-averse personal financial behavior. Renneboog and Spaenjers (2012) use Dutch survey data and find that religious households are more likely to save, have a stronger bequest motive, and have a longer planning horizon. Kurt, Inman, and Gino (2018) find that grocery spending decreases with religiosity using both field and laboratory data. They also find shoppers living in more religious counties make fewer impulse purchases than those living in less religious counties. If managers in more religious counties are also more frugal and have better impulse control, they might be spending less and making fewer impulse purchases. Once again, even if the managers themselves are not religious, they might still find it useful to go with the flow, i.e., to not make big conspicuous impulse purchases in order not to stick out in the eyes of the local population. And to the extent that managers sell their shares to fund their spending, we can expect managers in more religious counties to sell less as a result.

We do not have data on managers' spending on big-ticket items like Lamborghinis, yachts, mansions, etc. Instead, we conjecture that unprecedented big insider sales are more likely to be made to finance such expenditures. We use the method developed by Cohen, Malloy, and Pomorski (2012) to classify insiders into routine and non-routine traders. Specifically, a routine trader is one who made a trade in the same calendar month in each of the past three years. And a non-routine trader is one who did not. We focus on single sales transactions between $50,000 and $1 million made by non-routine traders[14], arguing that these are most likely to be made to finance one-time big purchases. We create a variable called *numbigsell*, which is the number of such big sell transactions made by the firm's managers in the current quarter. If there are no such transactions *numbigsell* is set to zero. We then take the logarithm of one plus the number of such big sell transactions and regress it, *lnumbigsell*, on local religiosity and other controls in Table 11. Column (1) shows there are significantly fewer big sell transactions in more religious counties; the coefficient of *rel* is -0.10334 and highly significant with a t-stat of -5.14. This is in line with the risk aversion explanation. In Column (2) we add two more variables: *badmonth10* and *firstqtr*. We add *badmonth10* to control for the possibility that the unprecedented big sale transaction could be an opportunistic trade to avoid big losses in the next quarter. The coefficient of *badmonth10* is insignificant, suggesting it is not the case. *Firstqtr* is a dummy variable showing whether the current quarter is the first calendar quarter of the year. We add this to see whether the big sell transactions are motivated by getting ready to pay the tax bill in April[15]. Again, its sign is insignificant, suggesting the big sell transactions are not for tax bill payment purposes. The coefficient of *rel,* on the other hand, is virtually unchanged, still negative, and highly significant, suggesting that risk aversion might be why higher local religiosity results in fewer sales by managers.

Second, we consider how higher risk aversion would affect the granting of stock options. Exercising and selling stock options is a big driver of insider sales, so if risk aversion affects the granting of stock options, it will also affect subsequent insider sales. Examining the effect of stock option grants on risk aversion, Heron, and Lie (2017) conclude that option grants increase managers' risk appetite. They find that managers' subjective valuation of stock options increases with volatility, especially idiosyncratic volatility. This gives them an incentive to inflate risk, especially idiosyncratic risk. In our case, one would expect firms in more religious counties to be more risk-averse and grant

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fewer options to their managers in order not to increase their risk appetites. On the other hand, firms in less religious counties will make a greater number of option grants, which will evidently lead to higher sales and lower purchases by the managers as they move to rebalance their portfolios.

Table 11
Regressions of Number of Big Sell Transactions on Local Religiosity

	(1)	(2)
VARIABLES	lnumbigsell	lnumbigsell
rel	-0.10334***	-0.10311***
	(-5.14)	(-5.12)
badmonth10		0.00508
		-0.81
firstquarter		0.01494
		-0.98
logpercapincome	0.02991***	0.02984***
	-3.4	-3.4
county65olderperc	-0.43156***	-0.43089***
	(-5.38)	(-5.37)
logpop	0.00631**	0.00627**
	-2.75	-2.73
mb	0.00453***	0.00453***
	-12.04	-12.08
size	0.04985***	0.05000***
	-16.91	-16.82
past return	0.11678***	0.11671***
	-8.02	-8.03
past volatility	-0.06608***	-0.06751***
	(-3.40)	(-3.39)
change in volatility	0.02545*	0.02538*
	-2.07	-2.02
intercept	-0.37683***	-0.38151***
	(-4.05)	(-4.10)
Observations	260,217	260,217
R-squared	0.092	0.092

Dependent variable is lnumbigsell, which is the logarithm of one plus the frequency of big, non-routine sales transactions. Big, non-routine sales are defined as any single open market sale transaction with a value between $50,000 and $1 million, which is made by a non-routine insider trader as defined using the definition in Cohen, Malloy and Pomorski (2012). A non-routine insider is one who did not trade in the same calendar month in each of the past three years. The independent variable of interest is county-level local religiosity (rel). Badmonth10 is a dummy variable that is set to one if there exists a market-adjusted monthly return of -10% or less in the next quarter. Firstquarter is a dummy variable set to one if it is the first calendar quarter of the year. Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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We explore this explanation in Table 12. We create a variable called *lnumoptmean*, which is the logarithm of one plus the average number of options granted per insider during the quarter. Average options granted per insider is the number of times an option award is given in the current quarter divided by the number of unique insiders to whom options were granted[16]. If no options were granted in the quarter, the average number of options granted per insider is set to zero, so *lnumoptmean* is also zero.

Table 12 shows the average frequency of option grants indeed influences insider trading. The coefficient of *lnumoptmean* in Column (1) is positive and significant suggesting managers sell more as they receive more option grants in the current quarter. They also increase purchases through option exercises, Column (3) shows the coefficient of *lnumoptmean* is 0.00012 with a t-stat of 3.49 suggesting at least some of those granted options are exercised right away. The coefficient of purchases in Column (2) has the expected negative sign but is insignificant. Net purchase measures in Columns (5) and (6) have negative signs, suggesting more option grants in the current quarter lead to decreases in net purchases.

In Table 13, we examine whether firms in more religious counties grant fewer options on average, as predicted by the risk aversion explanation. Column (1) shows that firms in more religious counties indeed grant much fewer options on average; the coefficient of *rel* is -0.40379 with a t-statistic of -5.70. To further ensure that risk aversion is driving this result, we add the ratio of Catholics to Protestants in a county (*cp*) in Column (2). There is evidence that Catholics are less risk-averse than Protestants when it comes to financial risks and have a more accommodating attitude towards gambling (Kumar et al. 2011). So, we would expect an increase in the average number of option grants per insider in counties with higher Catholic-to-Protestant ratios. Column (2) shows this is indeed the case; controlling for the level of religiosity, the coefficient of *cp* is positive and highly significant (0.01598 with a t-stat of 4.39). While religiosity is still negatively related to the average frequency of option grants with a coefficient of -0.4996 and a t-statistic of -5.84, a greater ratio of Catholics to Protestants partially offsets this effect. This once again supports the risk aversion explanation. Firms in more religious counties are granting fewer options per insider in order not to whet their managers' risk appetites. In Column (3) we add firm and institutional investor density measures. We expect the presence of many other public firms nearby to increase the average frequency of option grants as these firms are most likely competing for the same managerial talent pool and have to attract quality managers by using option grants as an incentive. Results in Column (3) strongly support this conjecture; the coefficient of *firms30dens* is positive and highly significant, with a coefficient of 3.91503 and a t-statistic of 6.79. When it comes to the presence of institutional investors in the vicinity of the firm, we see that the existence of 13F filing investors does not matter. This is not surprising since most of these asset managers have highly diversified portfolios with hundreds of firms, and they increasingly use passive investment strategies, so one would not expect them to be effective monitors. The density of 13-DG filing institutional investors around the firm, however, has a very strong negative effect on the average number of option grants per insider. These are big individual or institutional investors such as activist shareholders or hedge funds and are either already investors in the firm or might be potential future investors. So, they have a stronger monitoring incentive, and their mere presence around the firm significantly dampens the use of option grants. It is also worthwhile to point out that the coefficient for *rel* in Column (3) is still negative and highly significant. This

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suggests that local religion and local institutional investors both play a similar role in considerably reducing the use of option grants and limiting managers' risk appetite as a result.

Table 12
Abnormal Insider Trading and Frequency of Option Grants

	(1)	(2)	(3)	(4)	(5)
VARIABLES	QSell	QBuy	QOptBuy	QNetBuy	QOptNetBuy
lnumoptmean	0.00036**	-0.00002	0.00012***	-0.00037**	-0.00025*
	(2.44)	(-1.45)	(3.49)	(-2.59)	(-1.79)
rel	-0.00409***	-0.00030**	0.00008	0.00379***	0.00387***
	(-3.28)	(-2.21)	(0.23)	(2.99)	(3.13)
logpercapincome	0.00202***	0.00004	0.00023	-0.00198***	-0.00175***
	(3.89)	(0.76)	(1.66)	(-3.81)	(-3.48)
county65olderperc	-0.01429***	-0.00028	-0.00074	0.01402**	0.01328**
	(-2.95)	(-0.53)	(-0.46)	(2.84)	(2.74)
logpop	0.00024*	0.00002	0.00008*	-0.00021	-0.00013
	(1.79)	(1.64)	(1.88)	(-1.59)	(-0.99)
mb	0.00003	-0.00000**	0.00001	-0.00004*	-0.00003
	(1.60)	(-2.18)	(1.58)	(-1.78)	(-1.52)
size	0.00007	0.00002**	-0.00001	-0.00005	-0.00007
	(0.78)	(2.48)	(-0.55)	(-0.58)	(-0.76)
past return	0.00543***	-0.00022***	0.00037***	-0.00565***	-0.00528***
	(7.60)	(-5.62)	(6.30)	(-7.61)	(-7.37)
past volatiliy	0.00052	0.00018***	0.00025**	-0.00034	-0.00009
	(1.05)	(4.31)	(2.23)	(-0.66)	(-0.19)
change in volatility	0.00064	0.00011**	-0.00007	-0.00054	-0.00061
	(1.56)	(2.19)	(-0.67)	(-1.24)	(-1.55)
intercept	-0.02313***	-0.00086	-0.00403**	0.02227***	0.01824***
	(-4.26)	(-1.54)	(-2.75)	(4.08)	(3.52)
Observations	260,217	260,217	260,217	260,217	260,217
R-squared	0.019	0.009	0.009	0.019	0.016

Dependent variables in Columns 1-5 are quarterly abnormal insider sales (QSell), purchases (QBuy), purchases through exercises of options (QOptBuy), purchases minus sales (QNetBuy), purchases plus purchases through exercises of options minus sales(QOptNetBuy), all of which are the residuals from the quarterly cross-sectional regressions in Table 2, and expressed as a % of shares outstanding. The independent variables of interest are county-level local religiosity (rel), and lnumoptmean, which is the logarithm of one plus the average number of options granted per insider during the quarter. If no options were granted in the quarter, the average number of options granted per insider is set to zero, so lnumoptmean is also zero. Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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Table 13
Frequency of Option Grants and Local Religiosity

VARIABLES	(1) lnumoptmean	(2) lnumoptmean	(3) lnumoptmean
rel	-0.40379***	-0.49960***	-0.41172***
	(-5.70)	(-5.84)	(-6.53)
cp		0.01598***	
		-4.39	
firms30dens			3.91503***
			-6.79
instinv13f30dens			-0.10775
			(-1.18)
instinv13dg30dens			-2.63500***
			(-6.90)
logpercapincome	0.10394***	0.08284***	0.05176**
	-5.89	-4.94	-2.46
county65olderperc	-0.55930***	-0.80460***	-0.18537
	(-3.46)	(-4.12)	(-1.05)
logpop	0.02526***	0.01824***	-0.00713
	-6.14	-4.71	(-1.32)
mb	0.00432***	0.00433***	0.00457***
	-7.28	-7.31	-7.45
size	0.03362***	0.03473***	0.03425***
	-4.71	-4.87	-4.22
past return	-0.02000*	-0.01979*	-0.02054
	(-1.74)	(-1.74)	(-1.70)
past volatiliy	0.09655**	0.09652**	0.12188***
	-2.8	-2.81	-3.18
change in volatility	-0.04703	-0.04671	-0.05489
	(-1.45)	(-1.44)	(-1.51)
intercept	-0.97967***	-0.62017***	-0.12132
	(-5.05)	(-3.37)	(-0.49)
Observations	260,217	260,217	214,420
R-squared	0.092	0.093	0.1

Dependent variable is lnumoptmean, which is the logarithm of one plus the average number of options granted per insider during the quarter. Average number of options granted per insider is the number of option grants in the quarter made by the firm divided by the number of unique insiders who were granted options in that quarter. If no options were granted in the quarter, the average number of options granted per insider is set to zero, so lnumoptmean is also zero. Cp is county level Catholic to Protestant ratio. Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Firm-level local controls include the density of firms in a 30-mile radius circle around the firm's headquarters (firms30dens), the density of Form 13-F filing investors within 30 miles of the firm (Inst13f30dens), and the density of Form 13-D and 13-G filing investors within 30 miles of the firm (instinv13dg30dens). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

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E. Alternative Insider Trading Measures

We ran our main results using alternative insider trading measures like the quarterly dollar value of purchases and sales, the number of unique insider trading, and the insider trading ratio in Table 14. Our main results still hold. Looking at the dollar value of sales in Column (1), the coefficient of *rel* is -1,862,395 and significant at the 1 % level, which means going from a county at the 25th percentile of the distribution of religiosity (rel = 43%) to one at the 75th percentile (rel = 59%) will reduce sales by $298,837 by quarter. Similarly, the coefficient of *rel* in Columns (3) and (5) show that the purchases through the exercise of options is reduced by $81,357 per quarter, and net purchases are increased by $217,206 when going from a county at the 25th percentile of religiosity to one at the 75th percentile.

In column (6) the dependent variable is the number of unique insiders trading in the current quarter (Numtraders). The coefficient of *rel* is negative and significant suggesting fewer insiders trade in each quarter in more religious counties. Column (7) uses the insider trading ratio (Insratio), defined as the quarterly dollar value of insider purchases plus purchases through option exercises minus insider sales divided by the sum of the dollar value of insider purchases, purchases through option exercises, and insider sales. This ratio takes on values between -1 and +1, with -1 denoting pure selling and +1 pure buying activity. The sign of *rel* is positive and significant, pointing to reduced sales and increased net buying in more religious counties.

Finally, in unreported results, we also look at whether local religiosity affects the profitability of insider trading[17]. Following the approach of Contreras, Korczak, and Korczak (2023), we regress the 180-day buy-and-hold abnormal returns following purchase and sale transactions on local religiosity and other control variables. For open market purchases, the coefficient of the religion variable is negative, as in Contreras et al. (2023), but insignificant. For open market sales, the coefficient of the religion variable is negative, as in Contreras et al. (2023), but significant at the 5% level. This suggests that returns following sales in more religious counties are lower, suggesting managers of firms in higher local religiosity areas better time their sales to avoid losses. We do not find evidence of reduced profitability for purchases due to higher local religiosity. These results are consistent with our earlier findings in Table 10 that higher local religiosity does not necessarily deter opportunistic trading by the managers.

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Table 14
Regressions of Alternative Insider Trading Measures on Local Religiosity

VARIABLES	(1) QSellVal	(2) QBuyVal	(3) QOptBuyVal	(4) QNetBuyVal	(5) QOptNetBuyVal	(6) Numtraders	(7) Insratio
rel	-1,862,395***	-1,709	-507,029**	1,860,686***	1,353,657***	-0.38322***	0.04640*
	(-4.27)	(-0.30)	(-2.35)	(4.25)	(4.46)	(-3.88)	(1.82)
loginc	1,245,786***	2,812	530,270***	-1,242,974***	-712,704***	0.13783**	-0.03322**
	(5.65)	(1.02)	(4.16)	(-5.63)	(-4.44)	(2.53)	(-2.72)
county65olderperc	-894,756	-14,280	1,009,759	880,476	1,890,236*	-0.99363**	0.31264***
	(-0.62)	(-0.74)	(1.36)	(0.61)	(1.79)	(-2.58)	(3.14)
logpopsum	38,093	727	13,255	-37,365	-24,110	-0.01609	-0.00994***
	(0.87)	(1.45)	(0.60)	(-0.85)	(-0.75)	(-1.54)	(-3.70)
mb	108,532***	52	32,475***	-108,480***	-76,006***	0.01997***	-0.00350***
	(10.16)	(0.53)	(7.58)	(-10.14)	(-8.82)	(11.84)	(-8.87)
size	1,407,035***	4,061***	743,416***	-1,402,974***	-659,557***	0.30878***	-0.02424***
	(9.34)	(5.96)	(8.15)	(-9.29)	(-9.82)	(18.84)	(-9.83)
retmin12_q1	1,472,095***	-5,563***	387,209***	-1,477,659***	-1,090,449***	0.36321***	-0.09502***
	(5.24)	(-3.34)	(4.04)	(-5.24)	(-5.75)	(7.67)	(-8.23)
volmin6_q1	624,948	10,141***	414,528**	-614,807	-200,279	-0.06633	0.07401***
	(1.58)	(3.67)	(2.30)	(-1.55)	(-0.87)	(-0.94)	(4.14)
volmin6d	-318,679	-4,613	-207,762*	314,065	106,303	0.02268	-0.02808
	(-1.07)	(-1.67)	(-1.77)	(1.05)	(0.56)	(0.63)	(-1.62)
Intercept	-19,726,572***	-35,858	-9,547,264***	19,690,716***	10,143,452***	-1.60089**	0.53646***
	(-7.28)	(-1.20)	(-6.24)	(7.27)	(5.59)	(-2.79)	(4.31)
Observations	258,561	258,561	258,561	258,561	258,561	258,561	258,561
R-squared	0.137	0.014	0.149	0.137	0.074	0.126	0.047

Dependent variables in Columns 1-5 are quarterly values of insider sales (QSellVal), purchases (QBuyVal), purchases through exercises of options (QOptBuyVal), purchases minus sales (QNetBuyVal), purchases plus purchases through exercises of options minus sales (QOptNetBuyVal) expressed in 2017 dollars. Dependent variables in Columns 6-7 are the quarterly number of unique insider traders (Numtraders) and the insider trading ratio (Insratio). Numtraders is the number of unique insiders who have traded during the quarter. Insratio is defined as the quarterly dollar value of insider purchases plus purchases through option exercises minus insider sales divided by the sum of the dollar value of insider purchases, purchases through option exercises, and insider sales. This ratio takes on values between -1 and +1, with -1 denoting pure selling, and +1 pure buying activity. The independent variable of interest is county-level local religiosity (rel). Firm controls include market-to-book-ratio (mb), size (logarithm of assets), past return, past volatility, and change in volatility. County-level local controls include county population (logpop), percentage of county population 65 years and older (county65olderperc), and county per capita income (logpercapincome). Regressions include year times industry fixed effects. Industries are defined using Fama-French 49 industry definitions. Variable definitions are in Table 1. Standard errors are two-way clustered by firm and year, and robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

V. CONCLUSION

We present novel evidence on how local religiosity affects managers' insider trading.

Managers of firms in more religious counties sell significantly less than managers of firms in less religious counties. We argue that the main driver of this result is higher risk aversion in more religious counties, which reduces sales through two specific channels: First, firms in more religious counties grant fewer options in order to not increase managers' risk appetite, and managers have fewer shares to sell as a result.

Second, risk aversion is associated with prudent personal financial behavior, like increased frugality and better impulse control, resulting in fewer examples of

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conspicuous consumption. We conjecture that big, unprecedented insider sales are used to finance consumption of big-ticket items and show that such sales occur less frequently in more religious counties.

We also consider whether higher religiosity tempers managers' opportunistic impulses and deters them from taking advantage of inside information in their trades. Higher religiosity should reduce opportunistic behavior in at least two ways. First, one would expect higher religiosity to discourage unethical behavior like opportunistic insider trading. Second, higher religiosity is associated with higher risk aversion, which would deter managers from opportunistic trading for fear of legal ramifications.

Managers sell significantly more before a 10% market-adjusted drop in their stock price regardless of the level of local religiosity, suggesting managers in more religious counties still trade opportunistically to avoid losses. So, while higher risk aversion does not reduce opportunistic sales, it still reduces overall sales through the two mechanisms described above: by resulting in fewer stock option grants and in more prudent personal financial behavior resulting in less conspicuous consumption.

Finally, we present evidence that other local factors, like the density of local firms and investors affect insider trading as well. Managers are granted more options and sell more if there are more public firms nearby and are granted fewer options and sell less if there are more 13-DG filing investors nearby. Competition for local human capital and monitoring effects from potential big local sophisticated investors explain why insider trading is sensitive to the density of public firms and 13-DG filing investors around the firm.

Our results show local factors exert a strong influence on managers' risk-taking behavior when their own money is on the line, and accounting for such local factors will help us better understand managers' risk-taking behavior when it comes to their decisions involving the firm's money.

ENDNOTES

1. http://www.sec.gov/rules/final/34-46421.htm
2. Our data consists of legal insider trading transactions carried out by corporate insiders and reported to the SEC.
3. The ARDA data provides the county-level religion information for the years 1990, 2000, and 2010. We use the linear interpolation method for the years without available data. Using interpolation is a common practice for studies that use demographic, religious, and other local factors in the finance literature and other disciplines (e.g., Alesina and La Ferrara, 2000; Hilary and Hui, 2009; Kumar et al., 2011; Hasan et al., 2017; among others). We also use the linear interpolation method for the other local variables for the years without available data.
4. The transaction codes are "S" for open market sales, "P" for open market purchases, and "M" for purchases through the exercise of options. delete observations with cleanse codes "A" and "S."
5. We use the following position codes to identify managers: AV, C, CB, CEO, CFO, CI, CO, COO, CT, EVP, GC, GM, GP, H, O, OB, OD, OE, OT, OX, P, SVP, TR, VC, and VP.

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6. We use the following transaction codes in Table 1 of Thomson Insiders Database: "P" for open market purchases, "S" for open market sales and "M" for purchases through the exercise of stock options.
7. Other methods to capture abnormal insider trading have been proposed in the literature. For example, Cohen et al., (2012) remove routine trades to focus on non-routine (abnormal) trades as follows: "If an insider trades in the same month of the year for at least three years, all subsequent trades by the insider in that month are deemed routine trades." Although this method would capture routine trades to a certain extent, it does not account for the trade size, and as a result might end up missing certain trades that are clearly information motivated. In addition, this method does not control for the insider trading of peer insiders in other firms and does not extract information from managerial non-trading. For these reasons, we think our method will do a more comprehensive job of measuring abnormal insider trades.
8. 13-F filings are made institutional investment managers such as mutual funds who manage $100 million or more in assets, whereas 13-D or 13-G must be filed "when a person or group of persons acquires beneficial ownership of more than 5% of a voting class of a company's equity securities.." (https://www.sec.gov/fast-answers/answersshed13htm.html). 13-D is considered the long-form beneficial ownership report and is mandatory for active investors whose holdings exceed 20%. 13-G is intended for passive investors who own more than 5% but less than 20% of a public company's shares. Most hedge funds, activist investors, or other sophisticated big investors will file 13-D or 13-G therefore, we combine this group and call it 13-DG filers. We expect 13-DG filers to be more effective monitors than 13-F filers, which are mainly mutual funds.
9. Using corporate relocations to test the influence of local factors follows the approach of Pirinsky and Wang (2006).
10. Most of the top managers stay with the firm after the move. Specifically, 76% of the CEOs, 61% of CFOs, and 64% of the rest of the top management are still with the firm after the move. So, our results are due to mostly the same set of managers acting in accordance with the religiosity of the new location post-move. We do not suggest that individual managers change beliefs as they relocate, and we do not require that to draw our conclusions. We are only interested in how their actions change as a group. What we observe is that the insider trading behavior of the managers as a whole changes after the move and responds to the religiosity of the new location and gets disconnected from the religiosity of the old location. Whether it is due to managers changing their conduct (we do not argue their beliefs change) to comply with the local religiosity of the new location, or due to the firm hiring new managers (to replace those who left after the move) who are more likely to act in concert with the local religiosity of the new location (or a combination of both), the change still seems to be driven by the local religiosity of the new location.
11. The analysis uses a logit model to estimate the likelihood of being a *High Local Religiosity* firm in computing the propensity scores.
12. 0.01 caliper is used as the maximum distance level in the propensity score estimation.
13. We use the religiosity information from the 1971 county-level religion dataset provided on the Association of Religion Data Archives (ARDA)'s website.
14. Results are similar if we use $500,000 as the upper threshold or do not use an upper threshold at all.

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15. We also tried adding an April dummy, but it was also insignificant.
16. Results are similar if we use the average magnitude of option grants per insider defined as the total number of underlying shares in option grants divided by the number of insiders who were granted options, expressed as a percentage of shares outstanding. Results are also similar if we use the total number of option grants instead of the average per insider. We believe average option grants per insider better captures how frequent and widespread the use of option grants is across all the managers in the firm.
17. Results are available upon request.

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