DOES RELIGIOSITY MATTER TO VALUE RELEVANCE? EVIDENCE FROM U.S. BANKING FIRMS

By

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ABSTRACT

I examine whether religiosity is positively associated with the valuation multiples investors assign to fair valued items that are prone to managerial bias. Using a sample of U.S. banking firms, I find that the value relevance of net assets that are hard to verify is higher for firms located in more religious areas than for those located in less religious areas. Moreover, I hypothesize and find that audit quality and firm information environment quality moderate the positive association between religiosity and value relevance. I perform several robustness checks. First, I rule out several alternative explanations to my results. Second, I address the concern that my results suffer from an omitted correlated variable problem. Third, I show that my results hold for firms located in Urban as well as Rural areas.

Key words: fair value, managerial bias, value relevance, religiosity.

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DEDICATION

I dedicate my dissertation to all my family and in particular to my parents, Jemaa and Saida. I will always appreciate all they have done. I also dedicate this dissertation to my husband, Samir, who supported me throughout the process and my wonderful kids, Omar and Sarah.

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CHAPTER I. INTRODUCTION

The financial crisis of 2008–2009 fomented debate among accounting practitioners and academics regarding the usefulness and economic consequences of fair value accounting (Magnan 2009; Magnan and Thornton 2010). One issue concerns the extent to which the fair values of assets and liabilities reported by U.S. banking firms are relevant to the capital market's valuation of the firms' securities (Kolev 2008; Goh et al. 2009; Song et al. 2010). I extend this literature by examining the association between religiosity and value relevance. Motivation for the study stems from prior literature indicating that managers are likely to abuse their discretion when measuring fair values (Aboody et al. 2006; Hodder et al. 2006; Bartov et al. 2007) and from recent studies indicating that religiosity is likely to curb the abuse of managerial discretion in financial reporting (Grullon et al. 2010; Dyreng et al. 2012; McGuire et al. 2012).

Several studies show that managers' fair value estimates are subject to imprecision and bias (e.g., Aboody et al. 2006; Johnston 2006; Bartov et al. 2007). Kolev (2008), Goh et al. (2009), and Song et al. (2010) show that bank shareholders price information risk associated with the use of fair value accounting for financial assets and liabilities. Riedl and Serafeim (2011) find that investors require higher costs of capital for financial institutions with greater exposure to opaque financial assets reported at fair value in financial statements. The latter studies also identify factors that are associated with the value relevance of fair valued items. Goh et al. (2009) find that the market's pricing of the fair value estimates is higher for banks with higher audit quality and stronger capital adequacy. Song et al. (2010) report that the valuation multiples investors assign to firms' fair valued assets are positively associated with the firms' governance

strength. Riedl and Serafeim (2011) show that the quality of firms' information environments mitigates the information risk associated with opaque fair valued financial assets.

I extend these studies by examining another factor, religiosity, which is likely to be associated with the value relevance of assets and liabilities carried at fair value. Prior studies show that religiosity is positively associated with risk aversion (Miller and Hoffmann 1995; Osoba 2003) and ethical behavior (Longenecker et al. 2004).[1] All else being equal, these two correlates of religiosity are likely to deter managers from biasing fair value estimates. More risk-averse managers are less likely to intentionally bias fair value estimates, since the prospect of being caught decreases their expected utility to a greater degree. More ethical managers are also less likely to introduce any intentional bias during the fair valuation process. Hence, religiosity, through risk aversion and ethicality, is expected to be negatively correlated with biases that can occur during the fair valuation process.

Since fair valuation of items in financial statements involves different people, including accountants, managers, and auditors, any intentional bias imparted to fair value estimates does not depend on a specific individual. Therefore, I examine the general beliefs and values that prevail at the firm level. To proxy for these beliefs and values, I rely on social norm theory, which suggests that individuals prefer to conform to their peer group (Kohlberg 1984). Accordingly, I argue that managers and employees are likely to conform to the social norms of the area where they live and work. They are also likely to transmit those norms to the corporate culture.[2] Thus, in firms located in more religious areas, the corporate culture is likely to reflect the traits of religious people, including ethicality and risk aversion. In accordance with the risk-

[1] As explained by Dyreng et al. (2012), the honesty trait of more religious individuals stems from the fact that they are more often reminded by moral codes of conduct.

[2] Guiso et al. (2006) define culture as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation."

aversion argument, Hilary and Hui (2009) find that firms' degree of risk exposure tends to be lower in more religious U.S. counties. Moreover, Grullon et al. (2010), among others, provide evidence consistent with the ethicality argument. They find that corporate misbehavior is less likely to occur in firms located in more religious areas, suggesting that a higher level of ethicality prevails in those areas.

While the previous findings in the literature suggest that intentional bias in fair value estimates is likely to be lower in firms located in more religious areas, it is not clear whether investors recognize the negative association between religiosity and bias and price the fair value estimates accordingly. I investigate this research question by examining the valuation multiples investors assign to the fair value estimates. More specifically, I examine whether religiosity is positively associated with the valuation multiples that investors assign to net assets that are susceptible to bias. I also hypothesize that firms' audit quality and information environment quality moderate the positive association between religiosity and value relevance of fair value estimates.

I test my hypotheses using a sample of U.S. banking firms during 2008-2011. To proxy for religiosity, I follow McGuire et al. (2012) and use the Gallup interview responses database. The interview was conducted between January 2008 and May 2010, which matches my time period and covers 787 different U.S. counties, comprising a total of 649,392 responses. To proxy for assets and liabilities that are susceptible to bias, I rely on the three-level hierarchy provided by the Statement of Financial Accounting Standards 157, "Fair Value Measurements" (SFAS 157). Level 1 inputs comprise unadjusted, quoted prices in active markets for identical instruments; these inputs are directly observable. Level 2 inputs comprise other observable inputs, such as prices or yields of similar assets. Level 3 inputs are unobservable inputs

developed using the reporting entities' own estimates and assumptions, which are supposed to reflect those that market participants would use in reaching market clearing prices. While it is relatively easy for investors and auditors to assess the reliability of Level 1 fair values, additional time and effort are required to ensure the reliability of Level 2 and Level 3 fair value estimates. Therefore, my proxy for fair valued items that are susceptible to bias is Level 2 or 3 classifications.[3] Like Goh et al. (2009), I do not test my hypotheses using fair valued assets and liabilities individually because there is insufficient cross sectional variation in liabilities measured at fair value.[4] Rather, I test my hypotheses using net assets.

I find that the value relevance of net assets that are prone to managerial bias is higher for financial institutions located in more religious areas than for those located in less religious areas. Indeed, my results indicate that investors price one dollar of net assets that are prone to managerial bias at 69.3 cents for firms located in more religious counties, and only 49.2 cents for those located in less religious counties. Moreover, I find that the positive association between religiosity and value relevance of net assets that are prone to managerial bias is stronger in firms with lower audit quality and those with lower-quality information environments.

I perform several robustness tests. First, I rule out the alternative explanations that my findings are due to differences between firms located in more and less religious areas with respect to (1) operating behavior, (2) illiquidity risk, (3) per share amounts of net assets valued using not-directly-verifiable inputs, and (4) availability of valuation resources. Second, I address the concern that my results suffer from an omitted correlated variable problem. Third, I show

[3] While Level 3 inputs are harder to verify by shareholders, Level 2 inputs are economically more important in my sample; they represent approximately 90 percent of the fair value estimates.

[4] In my sample, Level 1 liabilities are different from zero in only 357 observations out of 5,592 observations. Level 2 liabilities are different from zero in only 1,500 observations and Level 3 liabilities are different from zero in only 680 observations.

that my results are not due to urban/rural geographical location. I also find that the positive association between religiosity and value relevance holds for Level 2 and Level 3 net fair value estimates individually and when I restrict my sample to the after-financial-crisis period (i.e. 2010-2011).

This study makes four contributions to the literature. First, it extends the literature on fair value accounting by identifying a new factor—religiosity—that is associated with investors' pricing of fair value estimates. Second, it adds to the growing literature on religiosity by providing evidence that the market perceives the role that religiosity plays in shaping managers' accounting choices. Third, it extends the literature on the role of religiosity in accounting to the banking industry, which is subject to regulatory oversight.[5] Fourth, this is the first study to link value relevance of the fair value estimates and firm location.

The rest of the thesis is organized as follows. The next chapter describes the institutional background on fair value accounting, reviews the related literature and develops the hypotheses. The research design, the sample and the data sources are presented in Chapter III. In Chapter IV, I provide some descriptive statistics and discuss the results. Chapter V provides a battery of robustness checks. The last Chapter concludes the study.

[5] Dyreng et al. (2012) explicitly exclude banks and public utilities from their sample when examining the effect of religiosity on earnings quality, on the basis that regulatory oversight may diminish the role of religiosity in curbing the abuse of accounting discretion.

CHAPTER II. INSTITUTIONAL BACKGROUND, REVIEW OF THE LITERATURE AND HYPOTHESES DEVELOPMENT

I. INSTITUTIONAL BACKGROUND ON FAIR VALUE ACCOUNTING

Several accounting standards issued by the Financial Accounting Standards Board (FASB) mandate the recognition of certain items at fair value. First, under Statement of Financial Accounting Standard (SFAS) 115, "Accounting for Certain Investments in Debt and Equity Securities," investment securities and debt securities that are "held for trading" or "available for sale" must be measured and recognized at fair value. Second, SFAS 123R, "Share Based Payments," mandates the use of the fair-value-based method of accounting to recognize share-based employee compensation expenses. Third, SFAS 133, "Accounting for Derivative Instruments and Hedging Activities", requires the measurement of all freestanding derivatives at fair value; it also mandates the measurement of hedged items at fair value, except for items subject to cash flow hedges. Fourth, SFAS No. 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," requires firms securitizing their receivables to recognize the cash flow streams retained by the firm at fair value.

Other standards permit the use of fair value. First, SFAS 159, "The Fair Value Option for Financial Assets and Financial Liabilities," allows firms to irrevocably measure many financial instruments at fair value rather than amortized cost on an instrument-by-instrument basis. Second, SFAS 155, "Accounting for Certain Hybrid Financial Instruments—an Amendment of FASB Statements No. 133 and 140" allows firms to elect fair value measurement for any hybrid financial instrument that contains an embedded derivative in cases in which a derivative would

otherwise have to be bifurcated. Third, SFAS 156, "Accounting for Servicing of Financial Assets: An Amendment of FASB Statement No. 140," permits a choice between the amortization method and the fair value measurement method for subsequent measurement of separately recognized servicing assets and servicing liabilities.

The FASB has also issued a number of standards that mandate the disclosure (as opposed to recognition) of certain items at fair value, including SFAS 107, "Disclosures about Fair Value of Financial Instruments," and SFAS 119, "Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments."

While several standards had long required or permitted the use of fair value, there was no consistent guidance on how to measure fair value until the FASB issued SFAS 157, "Fair Value Measurement," in 2006. This standard does not expand the use of fair value accounting to any additional items. Rather, it defines fair value, establishes a framework for measuring fair value, and enhances firms' disclosures about fair value measurements. The standard defines fair value as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (SFAS 157, para. 5). It emphasizes that a fair value measurement should be based on the assumptions that market participants would use in pricing the asset or liability, including assumptions about risk and assumptions about the effect of any restrictions on the sale or use of an asset. It also emphasizes that the reporting entity should consider the effect of its own credit risk on the fair value of a liability in all periods in which the liability is reported at fair value. The importance of these requirements for the purposes of this thesis cannot be overemphasized: they imply that if SFAS 157 is properly applied, financial statement readers should not need to make any additional fair

value adjustments based on the risk attributes of the firm that is holding a fair valued asset or has issued a fair valued liability.

In estimating the fair value of an asset or a liability whose price is not quoted in an active market, the reporting entity needs to choose a valuation technique or model, the inputs to the model, and an adjustment factor. Valuation techniques include the market approach[6] (such as matrix pricing to value debt securities), the income approach[7] (such as present value techniques and option-pricing models), and the cost approach.[8] If multiple valuation techniques are appropriate, the reporting entity should "evaluate the results (respective indications of fair value), considering the reasonableness of the range indicated by those results. The fair value measurement is the point within that range that is most representative of fair value in the circumstances" (SFAS 157, para. A13).

Regarding the inputs to the valuation model, the standard establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value according to three broad levels. Level 1 inputs are unadjusted, quoted prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. Level 2 inputs are inputs, other than the quoted prices included within Level 1, that are observable for the asset or liability, either directly or indirectly, through corroboration with observable market data. For example, the observed volatility of a publicly traded share of stock may be used as a Level 2 input in fair-valuing a non-traded call option on the stock. Level 3 inputs are unobservable inputs for the asset or liability, that is, inputs that reflect the reporting

[6] "The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities (including a business)" (SFAS 157, para. 18).
[7] "The income approach uses valuation techniques to convert future amounts (for example, cash flows or earnings) to a single present amount (discounted)" (SFAS 157, para. 18).
[8] "The cost approach is based on the amount that currently would be required to replace the service capacity of an asset (often referred to as current replacement cost)" (SFAS 157, para. 18).

entity's own view about the assumptions market participants would use in pricing the asset or liability, based on the best information available in the circumstances. For example, expected values of future net cash inflows may be used in a discounted-present-value model to value an asset.

Besides selecting the valuation technique and the inputs to the model, the reporting entity needs to make risk adjustments. It needs to adjust, for example, for the risk inherent in a particular valuation technique used to measure fair value (such as a pricing model), and/or the risk inherent in the inputs to the valuation technique. SFAS 157 specifically indicates that

> Risk-averse market participants generally seek compensation for bearing the uncertainty inherent in the cash flows of an asset or liability (risk premium). A fair value measurement should include a risk premium reflecting the amount market participants would demand because of the risk (uncertainty) in the cash flows. Otherwise, the measurement would not faithfully represent fair value. In some cases, determining the appropriate risk premium might be difficult. However, the degree of difficulty alone is not a sufficient basis on which to exclude a risk adjustment. (para. 29G).

Thus, when estimating fair values of items in Level 2 and 3 of the fair value hierarchy, managers need to exercise judgment in selecting the valuation technique, the inputs to the model, and the risk adjustment factor. The considerable level of judgment required during the valuation process leaves room for measurer bias and error.

II. RELATED LITERATURE

The current study builds on two streams of literature: the fair value accounting literature and the literature on religiosity. In what follows, I review the prior evidence that is germane to this study.

Fair valuation and management discretion

Prior evidence shows that bank managers have the incentive to manipulate earnings and capital (e.g, Collins et al. 1995; Ahmed et al. 1999; Dechow et al. 2010). One way managers can manipulate accounting numbers is by biasing fair value estimates. Valencia (2011) gives an example showing that the manipulation of the estimated fair values can have significant effects on banks' capital ratios. He shows that a 0.1% fair value increase in the mean net Level 3 assets results in an increase of approximately 11% in the primary capital ratio. Managers can also manipulate earnings by biasing the fair value gains and losses. The accounting rules for measuring assets and liabilities at fair value require that changes in fair value measurements that occur over time be reflected in net income or comprehensive income, offering the opportunity for firm managers to artificially boost reported earnings by recording large unrealized fair value gains.

To manipulate fair value estimates, managers may opportunistically choose an inappropriate valuation model, inappropriate inputs to the model or an inappropriate risk adjustment factor. Several studies provide evidence that managers abuse their discretion in selecting the model parameters used to estimate the fair value of employee stock options (ESOs).[9] For instance, Aboody et al. (2006) report that managers tend to select model parameters, especially expected option life and expected price volatility, to manage estimates of

[9] Stock option valuation requires estimates of future stock return volatility, expected option life, risk free rate and dividend yield.

disclosed employee stock option fair values. Bartov et al. (2007) find that firms opportunistically choose volatility measures (historical or implied) that reduce stock option expenses. Johnston (2006) compares firms that voluntarily recognize stock option expense in their financial statements to those that do not recognize the expense and finds that the former manage the stock option expense downward to a larger extent than the latter, by assuming a lower volatility level. Choudhary (2011) compares the reliability of executive stock option values across firms recognizing the stock option expense and those just disclosing the expense and finds that firms recognizing the fair values of ESOs as expenses in their financial statements underestimate ESO fair values to a larger extent than those just disclosing ESO fair values. They do so by lowering their estimates of stock price volatility.

SFAS No. 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," requires firms securitizing their receivables to recognize the cash flow streams retained by the firm at fair value. The fair value calculation is based on management assumptions about the likelihood of default, prepayment rates, and discount rates (Dechow et al., 2010). Dechow et al. (2010) show that firms valuing retained interests from securitizations tend to use lower discount rates when they report securitization losses rather than when they report gains.

SFAS No. 107 requires entities to disclose fair value estimates for many of their financial instruments including loans. Barth et al. (1996) conclude that loan fair values do not reflect completely the interest risk and the loan default risk. Also, Nissim (2003) provides evidence that banks manage the fair value of loans with the aim of favorably affecting the market's assessment of their risk and performance. More recently, Valencia (2011) shows that bank managers use

their discretion to manipulate the fair value estimates of Level 3 financial instruments to report positive current earnings and larger earnings than those of the previous quarter.

Consistent with the view that managers manipulate fair value estimates, several studies provide evidence that investors discount fair value estimates, especially those that are hard to verify. Khurana and Kim (2003) find that fair value is more (less) value relevant when objective market-determined fair value measures are (not) available. Using the three-level hierarchy provided by the standard 157, Goh et al. (2009) document that equity investors assign lower share price multiples to Level 2 and Level 3 net assets than to Level 1 net assets; similarly, Song et al. (2010) find that Level 3 assets are valued less than Level 1 and Level 2 assets.

Other studies examine factors that mitigate managers' incentives to manipulate fair value estimates and increase investors' confidence in reported fair values. Dietrich et al. (2001) investigate the reliability of fair value estimates for UK investment property and show that fair value estimates tend to be more reliable when appraisals are conducted by independent external appraisers. Muller and Riedl (2002) find lower bid-ask spreads for firms employing external appraisers relative to those employing internal appraisers in the UK investment property industry. Kolev (2008) provides evidence that the valuation reduction of mark to model estimates relative to mark to market fair values is more pronounced for firms that develop their estimates internally than for those that rely on valuation experts external to the firm.

There is also evidence that capital availability influences the value relevance of fair value estimates. For instance, Barth et al. (1996) find that the value relevance of loans is larger for healthier firms and Nissim (2003) provides evidence that banks with lower regulatory capital overstate the fair value of their loans to a larger extent. Goh et al. (2009) document that equity

investors assign higher valuation multiples to Level 3 net fair value assets for banks with higher capital adequacy ratios.

Audit quality also tends to improve the reliability of the fair value estimates. Goh et al. (2009) find that investors assign higher valuation multiples to Level 2 and Level 3 assets for banks with higher quality auditors and Song et al. (2010) show that audit quality is positively associated with higher value relevance of Level 3 assets.

Another factor that has been shown to improve the value relevance of the fair value estimates is disclosure quality. Bhat (2008) finds that the association between fair value gains/losses and returns increases with the level of disclosure. Goh et al. (2011) provide evidence that more fulsome disclosure attenuates the positive association between stock return volatility and the amount of Level 3 assets. Finally, Riedl and Serafeim (2011) show that compared to firms with higher ex-ante information environment quality, those with lower-quality information environments exhibit larger differences in implied betas across SFAS 157's three fair value levels.[10]

In summary, prior evidence suggests that firm managers tend to abuse their discretion when estimating fair values that are hard to verify and investors respond by discounting such fair value estimates. The market discount is mitigated by audit quality, disclosure quality, the use of an external appraisal and firm performance.

[10] The authors assume that firms having higher-quality information environments likely also have higher-quality disclosures.

Religion as a social norm

Weber (1905) contends that religion was a key determinant in the growth of twentieth-century capitalism. Since his seminal work, several studies examine the effect of religion and religiosity on different economic outcomes. For instance, Stulz and Williamson (2003) provide evidence that differences in religion explain differences in investor protection, as well as differences in enforcement of investor rights across countries. They find that creditor rights are stronger in countries where the main religion is Protestant rather than Catholic. They also find that mainly Protestant countries have better rights-enforcement than do mainly Catholic countries. Guiso et al. (2003) conclude that stronger religious beliefs are positively associated with economic attitudes that are conducive to higher per capita income and growth.

In this study, I focus on two traits of religious people that are likely to affect the managers' propensity to bias fair value estimates: ethicality and risk aversion.

Religiosity and ethical behavior

The ethicality trait of religious individuals stems from the fact they are often reminded by moral codes of conduct (Dyreng et al. 2012). At the individual level, Longenecker et al. (2004), using a questionnaire survey of business managers and professionals in the United States, find that respondents who indicate that religious interests were of high or moderate importance have higher levels of ethical judgment.

At the firm level, Grullon et al. (2010) show that stock option backdating, excessive compensation, aggressive earnings management, and securities class action lawsuits are less prevalent in firms headquartered in more religious U.S. counties. Dyreng et al. (2012) provide evidence that firms operating in U.S. counties with higher levels of religious adherence are less likely to be involved in financial statement restatements that overstate income, and that such

firms exhibit lower accounting risk values.[11] They also find that firms located in more religious counties tend to exhibit higher accrual quality and engage less in tax avoidance; they are also less likely to use aggressive tax shelters. Finally, McGuire et al. (2012) find that stronger religious social norms are associated with lower incidences of financial reporting irregularities measured by accounting risk, the likelihood of shareholder lawsuits, and the likelihood of accounting restatements.[12]

Religiosity and risk aversion

Three studies provide evidence that religious people are more risk averse than less religious people. Miller and Hoffmann (1995) report that religiosity is negatively correlated with attitudes toward risk taking and danger. Osoba (2003) finds that risk-averse individuals attend church more often than risk-seeking individuals. Hilary and Hui (2009) report that individuals who attend religious services more often are less likely to accept riskier expected payouts.

This risk-aversion behavior translates from the individual to the organizational level (Shu et al. 2010). In accordance with this argument, Hilary and Hui (2009) show that firms located in U.S. counties with higher levels of religiosity take less risk. More recently, Dyreng et al. (2012) find that firms located in more religious U.S. counties report higher proportions of bad news in press releases, presumably in order to avoid litigation.[13]

[11] The accounting risk metric used by the authors is developed by Audit Integrity and measures the risk that financial statements are misrepresented because of overstated (understated) revenue/assets (expenses/liabilities).

[12] The authors find however a positive association between religiosity and real earnings management. This result is consistent with the argument that managers of firms in more religious areas perceive real earnings management as less unethical or less risky than accruals manipulation.

[13] This result is also consistent with the honesty norms of religious individuals.

III. HYPOTHESES DEVELOPMENT

Prior evidence shows that bank managers have the ability to bias fair value estimates that are hard to verify; however, I argue that not all managers opportunistically use their discretion to do so. A corporate culture that emphasizes religiosity is likely to curb managerial bias in fair value estimates. The two traits of religious people, ethicality and risk aversion, are likely to be negatively associated with intentional bias. Risk-averse managers are unlikely to intentionally bias the fair value estimates, since the prospect of being caught significantly decreases their expected utility. Moreover, more ethical managers are less likely to introduce any intentional bias during the fair valuation process.

Fair valuation for all but Level 1 items is often a long process that involves different people, including accountants, managers, and auditors. Therefore, I do not focus on the religiosity of any single manager, such as the CEO, but on the general beliefs and values prevailing at the firm level. Relying on social norm theory and behavioral consistency theory, I proxy for the norms and beliefs at the firm level by those of the area where the firm is headquartered. Social norm theory states that individual behavior is influenced by the perception of how other members of a person's social group behave. In accordance with this theory, Kohlberg (1984) develops a framework in which individuals prefer to conform to the norms of their peers.[14] Since managers and other employees often live close to the area where their firm is headquartered, I expect them to conform to the social norms of that area.[15] Moreover, behavioral consistency theory posits that individuals behave consistently in different situations.[16] Thus, I

[14] Kreps (1997) provides different explanations for adherence to social norms: (1) it is less costly relative to violation, (2) it permits coordination, (3) it is costly but leads to better treatment by others than will violation, and (4) it is desirable, per se.

[15] Even when a particular manager is originally from another area, he or she is likely to come from an area with similar culture. Hilary and Hui (2009) find that when chief executive officers switch employers, they are more likely to join a firm with a similar religious environment.

[16] For instance, Cronqvist et al. (2012) find that corporate and personal leverage are positively associated.

expect managers and employees to conform to the norms of the area where they live and work not only in their social lives, but also at work. Those norms become part of the corporate culture. To the extent that ethicality[17] and risk aversion are two distinguishable traits of religious people, I expect these two traits to contribute significantly to the corporate culture of firms located in more religious areas. These two traits are likely to be negatively associated with measurer bias in making fair value estimates. Assuming that investors are, on average, rational, they are likely to assign higher valuation multiples for fair-valued items held by firms located in more religious areas to the extent that they recognize that religiosity curbs bias during the fair valuation process.

Hilary and Hui (2009) provide indirect evidence suggesting that investors perceive the positive association between religiosity and risk aversion. They find that the market reaction to merger and acquisition announcements, to the issuance of outside financing, and to the engagement in large tangible investment projects, is higher for firms located in more religious U.S. counties than for those located in less religious U.S. counties. They attribute their findings to the marginal investor in the equity market of these firms being less risk averse than the firm's managers. While these findings provide indirect evidence that investors perceive the positive association between religiosity and risk aversion, it is not clear whether investors also perceive that religiosity is negatively associated with measurer bias. One way investors can infer whether managers are likely to have biased the accounting numbers is by examining past firm earnings quality. Firms located in more religious areas exhibit higher earnings quality (e.g., McGuire et al. 2012; Dyreng et al. 2012). If marginal investors use information on past firm earnings quality, they price higher the fair value estimates of firms that are located in more religious areas, all else

[17] As argued by Dyreng et al. (2012) ". . . this trait does not stem from religious individuals being more honest than non-religious individuals, per se. Rather, geographic areas with high rates of religious adherence are more prone to display reminders of moral codes of conduct, such as "What Would Jesus Do?" bracelets or religious oriented bumper stickers such as the "sign of the fish."

being equal. However, evidence on whether investors use earnings quality information when valuing the firm is mixed. For instance, studies examining the association between cost of capital and earnings quality are inconclusive (see Dechow et al. 2010 for a discussion). Thus, it is not clear, a priori, whether investors perceive the role that religiosity plays during the fair valuation process and price the fair value estimates accordingly. Given the above discussions, I form the following hypothesis in the null form:

H1. The market pricing of reported fair values that are prone to managerial bias is not different for firms headquartered in more religious areas and those headquartered in less religious areas.

McGuire et al. (2012) find that the association between religiosity and financial reporting quality is stronger when external monitoring is lower. They find that religiosity is negatively associated with accounting risk, the likelihood of shareholder lawsuits, and the likelihood of a restatement, when dedicated institutional ownership is low and when financial leverage is low. However, they do not find any association between religiosity and accounting risk, nor between religiosity and the likelihood of a restatement, when external monitoring by dedicated institutions is high. El Ghoul et al. (2012) also find that religiosity is negatively associated with the firm's cost of capital to a larger extent when institutional ownership is low, suggesting that religiosity matters more when external monitoring is weaker.

Audit quality is an important external monitoring mechanism that can deter managers from biasing the fair value estimates and increase investors' confidence in reported fair values. There is evidence showing that audit quality is positively associated with earnings quality. Teoh and Wong (1993) report higher earnings response coefficients for firms with higher audit quality.

Becker et al. (1998) find that firms with higher audit quality have lower discretionary accruals than firms with lower audit quality. Farber (2005) reports that fraud-committing firms are less likely than non-fraud-committing firms to have Big-Four audit firms. Francis and Wang (2008) document a positive association between investor protection and timely loss recognition only for firms with better audit quality. Finally, in the fair value accounting literature, Goh et al. (2009) and Song et al. (2010) find that the value relevance of fair value estimates is higher for firms with better audit quality. Therefore, I expect that religiosity matters more for firms with lower audit quality. Accordingly, my second hypothesis is that:

H2. The positive association between religiosity and the market pricing of reported fair values that are prone to managerial bias is greater in firms with lower audit quality.

Disclosure quality can mitigate the information risk associated with fair value estimation. Bhat (2008) infers that corporate disclosure[18] aids market participants in evaluating the quality of fair value estimates. In a sample of 180 U.S. banks during 2003–2005, he finds that the association between fair value gains/losses—based on fair value estimates under SFAS 107—and returns increases with the level of disclosure. Also, Goh et al. (2011) infer that firms' disclosures in SFAS 157 notes help investors interpret Level 3 fair value estimates. In particular, they find that better disclosure attenuates the positive association between stock return volatility and the amount of Level 3 assets. Chung et al. (2013) report that a greater amount of voluntary

[18] "The disclosure measure is based on 92 individual items relating to capital structure, capital adequacy, market risk internal modeling, internal and external ratings, credit risk modeling, securitization activities, asset quality, credit derivatives and other credit enhancements, derivatives (other than credit derivatives), geographic and business line diversification, accounting and presentation policies and other risks" (p. 5).

disclosures regarding the controls, processes, and procedures in place to validate SFAS 157 fair value estimates is associated with higher credibility.[19] In particular, they find that more disclosures showing the reliability of fair value estimates: (a) increase the market pricing of Level 3 assets; (b) are associated with a lower systematic and information risk pertaining to Level 3 estimates; and (c) are positively associated with analyst consensus regarding firms' Level 3 estimates. Finally, Riedl and Serafeim (2011) assume that firms having higher-quality information environments are also likely to make higher-quality disclosures and provide evidence that compared to firms with high ex-ante information environment quality, those with lower-quality information environments exhibit larger differences in implied betas across the three fair value levels provided by SFAS 157.

To the extent that a higher quality information environment reduces information risk, investors consider higher religiosity and higher quality information environment as substitutes in curbing measurer bias. The positive association between religiosity and value relevance is then likely to be stronger in firms with lower quality information environments. Hence, my third testable hypothesis states that:

H3. The positive association between religiosity and the market pricing of reported fair values that are prone to managerial bias is higher in firms with lower quality information environments.

[19] The authors use the number of words in the reliability disclosures, scaled by the total number of words in the firm's 10-K report, as well as an indicator variable equaling one if there are any reliability disclosures, and zero otherwise.

CHAPTER III. RESEARCH DESIGN, SAMPLE AND DATA SOURCES

I. RESEARCH DESIGN

I test my three hypotheses using a modified Ohlson (1995) model. The model states that the market value of equity is equal to the book value of equity plus the discounted present value of future expected abnormal earnings. I proxy for expected abnormal earnings by reported net income (e.g., Goh et al. 2009; Song et al. 2010). For book value, I distinguish between net assets carried at historical cost and those carried at fair value. I further separate net assets carried at fair value into those measured using directly verifiable inputs (Level 1 inputs) and those measured using not-directly-verifiable inputs (Level 2 and Level 3 inputs).

To proxy for net assets valued using not-directly-verifiable inputs, I use SFAS 157's three-level hierarchy for assets and liabilities measured at fair value. Level 1 inputs are unadjusted, quoted prices for identical assets or liabilities in active markets. Level 2 inputs include (1) quoted prices for similar assets or liabilities in active markets, (2) quoted prices for identical or similar assets or liabilities in markets that are not active, (3) inputs other than quoted prices that are observable for the asset or liability, and (4) market corroborated inputs. Hence, Level 2 assets and liabilities are valued using directly and indirectly observable inputs, other than Level 1 inputs. SFAS 157 defines observable inputs as inputs that reflect the assumptions market participants would use in pricing the asset or liability based on market data obtained from sources independent of the reporting entity. Level 3 inputs are unobservable inputs to valuation models based on the reporting entity's internal assessments of hypothetical market participant assumptions. The inputs are developed based on the best information available in the

circumstances. For both Level 2 and 3 valuations, the objective is to estimate what the price of the item would be if it were traded in the market.

Level 1 inputs are directly observable and easily verifiable by auditors and shareholders. In contrast, the valuation of Level 2 and Level 3 assets and liabilities requires judgment, and the inputs used in their valuation are not as readily verifiable. Thus, Level 2 and Level 3 fair value estimates are more likely to be biased than Level 1 estimates. In accordance with this argument, Benston (2008, 104) states that "fair values other than those taken from quoted prices (Level 1) could be readily manipulated by opportunistic and overoptimistic managers, would be costly to make, and very difficult for auditors to verify and challenge." I proxy for assets and liabilities that are more prone to bias by the sum of Level 2 and Level 3 net fair value assets, where net fair value assets are the difference between fair valued assets and liabilities.

I examine the association between price per common share and the fair values of net assets per share, testing whether pricing multiples for net assets valued using not-directly-verifiable inputs are associated with the degree of religiosity of the area in which firms are headquartered. My regression model is as follows:

$$PRC_{i,t} = \gamma_0 + \gamma_1 EPS_{i,t} + \gamma_2 NETBE_{i,t} + \gamma_3 FV1_{i,t} + \gamma_4 FV23_{i,t} + \gamma_5 REL_i + \gamma_6 REL_i \times EPS_{i,t} + \gamma_7 REL_i \times NETBE_{i,t} + \gamma_8 REL_i \times FV1_{i,t} + \gamma_9 REL_i \times FV23_{i,t} + e_{i,t} \quad (1)$$

In equation (1), $PRC_{i,t}$ is the closing share price measured on the day following the Securities and Exchange Commission (SEC) filing for firm *i* in quarter *t*. $EPS_{i,t}$ is earnings per share, where earnings are measured as income before extraordinary items available for common shareholders. $NETBE_{i,t}$ is net assets carried at historical cost per share. $FV1_{i,t}$ is net assets marked

to market using directly observable inputs per share (Level 1 in the SFAS 157 three-level hierarchy), and $FV23_{i,t}$ is net assets fair valued using not-directly-verifiable inputs per share, proxied by the sum of Level 2 and 3 net fair value assets per share. Net fair value assets are equal to the difference between reported values of fair valued assets and fair valued liabilities. The variable REL_i is a dummy variable that is equal to one if the firm is located in a more religious county and zero if it is located in a less religious county. More religious counties are those with a religiosity proxy equal to or greater than the sample median.

To proxy for religiosity, I follow McGuire et al. (2012) and use the responses to the questions asked in the interview conducted by the Gallup organization to construct religiosity measures. The interview was conducted between January 2008 and May 2010; it covers 787 different U.S. counties, amounting to a total of 649,392 responses. Three questions related to religiosity were posed to interviewees: (1) whether religion is important in their daily lives, (2) whether they attend religious services on a weekly basis, and (3) whether they have a religious affiliation. Using the responses to these three questions, I construct a religiosity score.[20]

To mitigate concerns relating to outliers, I winsorize all the continuous variables at the first and 99th percentiles. I test my regression model using ordinary least squares and cluster the standard errors by quarter.[21]

To test my first hypothesis, I estimate model (1) and examine the coefficient γ_9. An insignificant coefficient on the interaction term $FV23_{i,t} \times REL_i$ could be attributed to (1) religiosity not reducing measurer bias during the fair valuation process and investors recognizing that fact, or to (2) religiosity reducing managers' bias and investors not recognizing the role that

[20] According to this score, the ten most religious counties in the U.S. are (1) Bolivar, MS, (2) Utah, UT, (3) Hancock, TN, (4) Neshoba, MS, (5) Clarke, AL, (6) Lee, MS, (7) Atkinson, GA, (8) Hempstead, AR, (9) Putnam, OH and (10) Anderson, SC.

[21] Thompson (2011) argues that if the dimensions of the panel are unbalanced, the bias disappears if we single-cluster on the less-numerous dimension.

religiosity plays. A positive coefficient would be consistent with the joint hypotheses of (1) investor rationality and market efficiency, and (2) religiosity reducing bias in Level 2 and Level 3 fair value estimates.

To test my second hypothesis, I consider firms audited by one of the Big Four auditors as those with higher audit quality. Compared to small auditors, Big Four auditors are more likely to conduct more comprehensive audits than other auditors because they (a) have more to lose from audit failures (DeAngelo 1981) and (b) have more resources to conduct their audits (Craswell et al. 1995), including technical resources relating to the complexities of fair value measurements. I expect that religiosity plays a more significant role in reducing measurer bias for firms audited by non-Big Four auditors. I add to my regression model a dummy variable that is equal to one for firms audited by one of the Big Four auditors and zero otherwise, as well as its interaction with each of the independent variables. I also add to my regression model three interaction terms: audit quality, religiosity and each of the determinants of price. I estimate the following regression and expect γ_{19}, the coefficient of the interaction term $BIG4_{it} \times REL_i \times FV23_{i,t}$ to be negative.

$$PRC_{i,t} = \gamma_0 + \gamma_1 EPS_{i,t} + \gamma_2 NETBE_{i,t} + \gamma_3 FV1_{i,t} + \gamma_4 FV23_{i,t} + \gamma_5 REL_i + \gamma_6 REL_i \times EPS_{i,t} + \gamma_7 REL_i \times NETBE_{i,t} + \gamma_8 REL_i \times FV1_{i,t} + \gamma_9 REL_i \times FV23_{i,t} + \gamma_{10} BIG4_{i,t} + \gamma_{11} BIG4_{i,t} \times EPS_{i,t} + \gamma_{12} BIG4_{i,t} \times NETBE_{i,t} + \gamma_{13} BIG4_{i,t} \times FV1_{i,t} + \gamma_{14} BIG4_{i,t} \times FV_{23} + \gamma_{15} BIG4_{it} \times REL_i + \gamma_{16} BIG4_{it} \times REL_i \times EPS_{i,t} + \gamma_{17} BIG4_{it} \times REL_i \times NETBE_{i,t} + \gamma_{18} BIG4_{it} \times REL_i \times FV1_{i,t} + \gamma_{19} BIG4_{it} \times REL_i \times FV23_{i,t} + e_{i,t} \quad (2)$$

Finally, to test my third hypothesis, I add to my regression model a measure of the information environment quality of the firm (DINF_ENV_QUALITY), as well as its interaction with each of the independent variables. DINF_ENV_QUALITY is a dummy variable that is equal to one if the quality of the information environment is high (greater than or equal to the median), and zero otherwise. I also add to my regression model, three interaction terms: quality of the information environment, religiosity and each of the determinants of price. I estimate the following regression and expect the coefficient γ_{19} to be negative.

$$PRC_{i,t} = \gamma_0 + \gamma_1 EPS_{i,t} + \gamma_2 NETBE_{i,t} + \gamma_3 FV1_{i,t} + \gamma_4 FV23_{i,t} + \gamma_5 REL_i + \gamma_6 REL_i \times EPS_{i,t} +$$
$$\gamma_7 REL_i \times NETBE_{i,t} + \gamma_8 REL_i \times FV1_{i,t} + \gamma_9 REL_i \times FV23_{i,t} + \gamma_{10}\text{DINF\_ENV\_QUALITY}_{i,t} +$$
$$\gamma_{11}\text{DINF\_ENV\_QUALITY}_{i,t} \times EPS_{i,t} + \gamma_{12}\text{DINF\_ENV\_QUALITY}_{i,t} \times NETBE_{i,t} +$$
$$\gamma_{13}\text{DINF\_ENV\_QUALITY}_{i,t} \times FV1_{i,t} + \gamma_{14}\text{DINF\_ENV\_QUALITY}_{i,t} \times FV_{23} +$$
$$\gamma_{15}\text{DINF\_ENV\_QUALITY}_{it} \times REL_i + \gamma_{16}\text{DINF\_ENV\_QUALITY}_{it} \times REL_i \times EPS_{i,t} +$$
$$\gamma_{17}\text{DINF\_ENV\_QUALITY}_{it} \times REL_i \times NETBE_{i,t} + \gamma_{18}\text{DINF\_ENV\_QUALITY}_{it} \times REL_i \times$$
$$FV1_{i,t} + \gamma_{19}\text{DINF\_ENV\_QUALITY}_{it} \times REL_i \times FV23_{i,t} + e_{i,t} \quad (3)$$

II. SAMPLE

Table 1 outlines the sample selection. SFAS 157 became effective for financial statements issued for fiscal years ending after November 15, 2007. Thus, my sample period begins in the first quarter of 2008 and ends in the third quarter of 2011, the most recent quarter for which data are available at the time of writing.

I focus on financial firms because they have a material proportion of assets and liabilities carried at fair value. The sample firms were initially identified from CRSP/Compustat Merged—Banks Quarterly database. For missing data, I checked the database Compustat Fundamentals Quarterly. Firms covered in CRSP/Compustat Merged Banks Quarterly database are commercial banks (SIC Code 6020); state commercial banks (SIC Code 6022); savings institutions, Federal chartered (SIC Code 6035); savings institutions, not Federal chartered (SIC Code 6036); and life insurance (SIC Code 6311).

My initial sample includes 9,487 observations. As Table 1 shows, I delete observations with quarters ending other than in March, June, September, and December (102 observations) and observations with missing accounting data (1,509 observations), missing filing dates data (1,342 observations), and missing stock price data (123 observations). I also exclude financial institutions listed on stock exchanges other than the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or NASDAQ (357 observations). I drop observations for which information about the location of the firm headquarters is not available in the Compustat or Audit Analytics databases (300 observations) and observations with missing religiosity data (162 observations). I end up with a total of 5,592 observations, representing 413 unique firms, to test my first hypothesis.[22] The number of observations used to test hypotheses H2 and H3

[22] This includes 4,034 observations for banks, 1,103 observations for savings institutions, federal chartered, 440 observations for savings institutions, not federal chartered, and 15 observations for life insurance.

depends on the availability of the data with respect to the variables used in the regression equations and will be documented in the relevant tables.

III. DATA SOURCES

Accounting and stock price data come from CRSP/Compustat Merged Database—Bank Quarterly. The Capital IQ database provides the dates when firms file their reports with the SEC. Data on firm location are gathered from Compustat and Audit Analytics databases. Religiosity data come from the Gallup interview responses database. Audit data come from the Audit Analytics database, and analyst data are gathered from the Institutional Brokers' Estimate System (I/B/E/S) Summary Tape database.

Table 1. Sample Construction

Criteria	Number of Observations
Initial number of observations	9,487
Deduct:	
Firm quarters ending other than in March, June, September, December	(102)
Missing accounting data	(1,509)
Missing filing date data	(1,342)
Missing stock price date data	(123)
Firms not listed in NYSE, AMEX or NASDAQ	(357)
Missing data on financial institution location	(300)
Missing data on religiosity	(162)
Sample size for empirical testing of hypothesis 1	5,592

CHAPTER IV. RESULTS

I. DESCRIPTIVE STATISTICS

Table 2, Panel A provides descriptive statistics for the three religiosity measures, calculated using the Gallup survey responses. On average, 68.73 percent of the population interviewed considers religion important in their daily lives, 86.86 percent are affiliated with a religious group, and 37.57 percent attend religious services at least weekly.

Table 2, Panel B reports the correlations among these variables. The three individual religiosity measures are highly correlated, with correlation coefficients ranging between 0.718 and 0.890. These high correlations among the variables show that they are likely to be capturing the same construct. Following McGuire et al. (2102), I apply principal components factor analysis to these variables to derive a single score that better reflects religiosity.

Panel C of Table 2 reports the results of the principal components factor analysis. The factor loading coefficients are reported in Column 1. They represent the correlations between the individual religiosity measures and the religiosity factor I am estimating. As expected, the three factor loadings are positive. Column 2 provides the Kaiser-Meyer-Olkin measure of sample adequacy. The value of this measure is larger than 0.65 for each of the three variables, indicating the appropriateness of the factor analysis. The last column reports the factor scoring coefficients, which are the coefficients used with the standardized versions of the individual religiosity variables to obtain the religiosity score.

In Table 3, I report some descriptive statistics (Panel A), as well as the correlation matrix (Panel B) for the main variables. The mean share price is $13.428. The mean (median) Level 1, Level 2, and Level 3 net fair value assets are $1.176 ($0.022), $25.575 ($18.830) and $0.767

($0.000) per share, respectively. Hence, most of the net fair valued assets are classified as Level 2. Less than 50 percent of sample firms have assets or liabilities classified as Level 3. The mean value of net assets carried at historical cost per share is negative (–$12.618), reflecting the fact that the average sample firm has more liabilities (such as deposits) than assets carried at historical cost. Table 3, Panel B reports the correlation matrix among the variables of interest for the pooled sample. The variable price is positively correlated with each of the three net fair value assets levels. The highest correlation is between price and Level 2 net fair value assets per share.

Table 4 compares firms located in more religious counties (more religious) to those located in less religious counties (less religious). Across all panels, the first, second, and third columns report the variable means for the total sample, the more religious subsample, and the less religious subsample, respectively. The fourth column reports the difference in means between the two subsamples and the fifth reports the t-test statistic for the latter difference.

In Panel A, I report statistics for some selected variables, including firm size, return on assets (ROA), book to market (BM) ratio, leverage, and volatility. I measure firm size by total assets (TA) and market capitalization (mv). Return on assets is measured as net income divided by total assets. The BM ratio is measured as the ratio of the book value of shareholders' equity minus the book value of preferred stock to the market value of common shareholders' equity. Leverage is the debt-to-equity ratio, defined as long-term debt divided by market capitalization. I proxy volatility by the standard deviation of ROA. I find that firms in both subsamples are about the same size, measured by total assets. They have comparable ROA and similar volatility. Firms

located in more religious counties have, however, larger BM ratios, are less levered, and have lower market capitalization.[23]

In Panels B, C and D, I provide descriptive statistics for the variables of interest. The variables are measured per dollar of TA, per dollar of equity (mv), and per share (shares), in Panel B, C and D, respectively. I find that firms located in more religious counties have greater proportions of Level 2 net fair value assets and lower proportions of net assets carried at historical cost.

II. REGRESSION RESULTS

My first hypothesis (in null form) states that the market pricing of net assets that are more prone to managerial bias is not different for firms headquartered in more religious areas than for those headquartered in less religious areas. I distinguish between firms located in more religious areas (more religious subsample) and those located in less religious areas (less religious subsample) using the sample median of (1) the religiosity score derived from the factor analysis, (2) the simple average of the three religiosity measures, and (3) each of the three individual religiosity measures. More religious areas are those with a religiosity proxy equal to or greater than the sample median.

The regression results are reported in Table 5. The first column reports the regression results of price on its economic determinants: earnings per share (EPS), net assets carried at historical cost per share (NETBE), net assets measured using directly verifiable inputs per share (FV1) and net assets valued using not-directly-verifiable inputs per share (FV23). I find that the coefficients of FV1 and FV23 are statistically different from zero, indicating that they are both

[23] The larger BM ratios of firms located in more religious areas is consistent with the findings of Hilary and Hui (2009) whose results indicate that firms located in more religious areas exhibit less growth than firms located in less religious areas due to their lower investment rate stemming from their higher risk aversion.

value relevant. However, the coefficient of FV1 is not different from one (p-value = 0.8422), whereas the coefficient of FV23 is less than one (p-value = 0.0000). I also find that investors assign higher valuation multiples to net assets valued using directly verifiable inputs than net assets valued using not-directly-verifiable inputs (p-value = 0.0000). The two latter results are consistent with Level 2 and Level 3 fair valued items exhibiting, on average, higher information risk than Level 1 fair valued items and investors perceiving their susceptibility to overstatement bias.

The results of the first hypothesis using the religiosity score derived from the factor analysis to distinguish between more and less religious areas are reported in the second column of Table 5. I find that, on average, investors assign higher valuation multiples to net assets valued using not-directly-verifiable inputs for firms located in more religious counties than for those located in less religious counties. Indeed, investors price one dollar of net assets valued using not-directly-verifiable inputs at 69.3 cents for firms located in more religious counties, and at only 49.2 cents for firms located in less religious counties. The difference in the market pricing is economically and statistically significant. The valuation multiple that investors assign to net assets valued using not-directly-verifiable inputs is 40.85 percent higher for firms located in more religious counties than for those located in less religious counties. The difference is statistically significant at the one percent level.

In addition, I find that the market prices one dollar of Level 1 net fair value assets at approximately one dollar for firms located in more religious areas, and at 88.8 cents for firms located in less religious areas. The difference in the market pricing is, however, only statistically significant at the ten percent level. This result is consistent with Level 1 net assets being resistant to bias and investors perceiving this fact.

My results also indicate that investors assign higher valuation multiples for net assets carried at historical cost for firms located in more religious counties than for those located in less religious counties. Assets and liabilities carried at historical cost are also subject to bias. For instance, managers can manipulate loan loss provisioning and recognition (e.g., Ahmed et al. 1999; Huizinga and Laeven 2009). Huizinga and Laeven (2009) provide evidence that, during 2008, banks used accounting discretion regarding the provisioning and recognition of loan losses to preserve book capital. They find that banks with large Mortgage Backed Securities (MBS) exposures, in particular distressed ones, report relatively low rates of loan loss provisions and loan charge-offs, indicating that those banks lower their provisioning standards and are slow in recognizing losses. Managers can also bias the value of items carried at historical cost by misclassifying certain financial assets and liabilities (Huizinga and Laeven 2009).[24] Consistent with the potential bias in assets and liabilities carried at historical cost, my results indicate that investors assign higher valuation multiples to net assets carried at historical cost for firms located in more religious areas than to those located in less religious areas.

To check the sensitivity of my results, I also use the simple average of the three individual religiosity measures. The results are reported in the third column of Table 5. I find that investors assign higher valuation multiples to net assets valued using not-directly-verifiable inputs for firms located in more religious counties than to those located in less religious counties. I also use each of the three individual religiosity measures to distinguish between firms located in more religious counties and those located in less religious counties. My inferences remain the same; investors assign higher valuation multiples to net assets valued using not-directly-verifiable inputs for firms located in more religious counties than to those located in less religious counties.

[24] Securities held-to-maturity are carried at amortized cost while those available for sale are carried at fair value. When amortized cost exceeds fair value, managers have the incentive to reclassify available-for-sale securities as held-to-maturity securities.

The difference in the market pricing between the two subsamples is statistically significant at conventional levels, except when I proxy for religiosity by the percent of the population who consider religion important in their daily lives. In that case, the difference in the market pricing of net assets valued using not-directly-verifiable inputs is only statistically significant at the 16 percent level.

Overall, the results summarized in Table 5 strongly reject my first hypothesis. They indicate that investors discount net assets valued using not-directly-verifiable inputs less for firms located in more religious counties than for those located in less religious counties.

My second hypothesis states that the positive association between religiosity and the market pricing of net assets valued using not-directly-verifiable inputs is stronger in firms with lower audit quality. Song et al. (2010) find that audit quality is positively associated with higher value relevance of Level 3 fair valued assets. Moreover, Goh et al. (2009) provide evidence that audit quality is positively associated with the market pricing of Level 2 and Level 3 net fair value assets. Consistent with prior literature, I consider firms audited by one of the Big Four auditors as those with higher audit quality.[25]

The regression results are summarized in Table 6. I find that the coefficient of the three interaction term BIG4 × REL × FV23 is negative, showing that the positive association between religiosity and the value relevance of net assets that are prone to managerial bias is stronger for firms with lower audit quality. This result supports my second hypothesis.

My third hypothesis states that the positive association between religiosity and the market pricing of net assets valued using not-directly-verifiable inputs is stronger in firms with lower information environment quality. Goh et al. (2011) show that firms disclose more information in SFAS 157 notes when they are followed by a greater number of analysts. Therefore, I use the

[25] The Big 4 audit firms are PriceWaterhouseCoopers, Ernst & Young, KPMG, and Deloite & Touche.

number of analysts following the firm as my first proxy for the quality of the information environment of the firm. Also, following Riedl and Serafeim (2011), I use analyst forecast error and forecast dispersion as proxies for the quality of the information environment of the firm. Firms with higher analyst forecast error and forecast dispersion are likely to exhibit lower quality information environments (Riedl and Serafeim, 2011).

I obtain from the I/B/E/S database the number of analysts issuing quarterly earnings forecasts during the three months that precede the end of quarter *t.* Descriptive statistics not appearing in tables show that the number of analysts following the firm ranges from 0 to 26, with a mean of 5.56 and a median of 1. I measure analyst forecast error as the absolute difference between actual EPS and the consensus analyst forecast, deflated by the stock price of firm *i* at the end of quarter *t.* I consider forecasts made by analysts during the three months that precede the end of quarter *t.* I measure analyst forecast dispersion by the standard deviation of the forecasts made by analysts during the three months that precede the end of quarter *t* for firm *i,* deflated by the stock price of firm *i* at the end of quarter *t.* I use the median of the number of analysts following the firm, the median of analyst forecast error, and the median of the dispersion of analyst forecast to distinguish between firms with lower and higher quality information environments.

The regression results are reported in Table 7. The coefficient of the three-way interaction term DINF_ENV_QUALITY × REL × FV23 is negative for each of the three proxies of the information environment quality of the firm. Hence, consistent with my third hypothesis, I find that the positive association between religiosity and the value relevance of net assets valued using not-directly-verifiable inputs is stronger in firms with lower quality information environments.

Table 2. Religiosity Measure

Panel A: Descriptive Statistics

Variable	*N*	Mean	*p*50	*p*25	*p*75	SD
Importance	787	68.7	69.0	61.4	76.6	11.3
Attendance	787	37.5	37.2	30.9	44.2	9.7
Affiliation	787	86.8	87.8	84.3	90.5	5.6

Panel B: Correlations

	Importance	Attendance	Affiliation
Importance	1.0000		
Attendance	0.8899 0.0000	1.0000	
Affiliation	0.7647 0.0000	0.7179 0.0000	1.0000

Panel C: Principal Component Factor Analysis

	Factor Loading Coefficients	Kaiser-Meyer-Olkin Measure Of Sampling Adequacy	Scoring Coefficients
Importance	0.9561	0.6520	0.37003
Attendance	0.9393	0.6876	0.36354
Affiliation	0.8873	0.8640	0.34340

Panel A reports descriptive statistics of the three individual religiosity measures. Panel B reports the correlations between the three religiosity measures. Panel C reports the results of the principal component factor analysis. Importance is the proportion of Gallup respondents that indicate that religion is important in their daily lives. Attendance is the proportion of Gallup respondents that indicate that they attend religious services at least weekly. Affiliation is the proportion of Gallup respondents that indicate that they are affiliated with a religious group.

Table 3. Descriptive Statistics and Correlation Matrix

Panel A: Means, Minimums, Maximums, Quartiles and Standard Deviations

Variable	Mean	Min	Max	*p*25	*p*50	*p*75	SD
PRC	13.4280	.8840	54.9700	6.2865	10.4900	16.8800	10.7129
EPS	.0462	-3.8981	1.1904	.0077	.1249	.3038	.6511
NETBE	-12.6176	-101.2964	18.3861	-18.9579	-6.9903	.4680	21.0313
FV1	1.1758	0	20.6524	0	.0224	.3787	3.3997
FV2	25.5751	0	116.2520	9.1827	18.8352	34.3060	23.4908
FV3	.7670	-.6147	16.1686	0	0	.2987	2.4141
FV23	26.3422	-.6147	132.4206	9.5815	19.3537	35.0664	24.1340

Panel B: Correlations

	FV1	FV2	FV3	FV23	NETBE	EPS	Prc
FV1	1.0000						
FV2	0.0842 0.0000	1.0000					
FV3	0.2030 0.0000	0.2187 0.0000	1.0000				
FV23	0.1023 0.0000	0.9952 0.0000	0.3129 0.0000	1.0000			
NETBE	-0.2569 0.0000	-0.9261 0.0000	-0.2568 0.0000	-0.9271 0.0000	1.0000		
EPS	0.0154 0.2498	0.1064 0.0000	0.0460 0.0006	0.1082 0.0000	-0.1111 0.0000	1.0000	
PRC	0.2173 0.0000	0.5239 0.0000	0.2768 0.0000	0.5376 0.0000	-0.4040 0.0000	0.3100 0.0000	1.0000

This table provides some descriptive statistics and the correlations between the main variables used in the study. The variable PRC is the closing share price measured on the day following the SEC filing for firm *i* in quarter *t*. EPS is earnings per share. NETBE measures net assets carried at historical cost. FV1, FV2 and FV3 are Level 1, 2 and 3 net fair valued assets per share, respectively. FV23 is the sum of Level 2 and Level 3 net fair value assets.

Table 4. Comparison of Firms Located in More Religious and Less Religious Counties

	Total Sample	Less religious	More religious	Difference in Mean	T-test Statistic
Panel A: Descriptive Statistics of Selected Variables					
TA	9697.2720	10320.7300	9073.8100	1246.9240	1.3346
Mv	1066946	1238413	895479	342933.9	3.0078***
ROA (%)	.0140	.0200	.0090	.0110	0.7868
BM	1.3728	1.2944	1.4511	-.1566	-6.4206***
Leverage	1.8239	1.9428	1.7050	.2377	2.6152***
σ(ROA)	.0030	.0029	.0030	-.0001	-0.2799
Panel B: Descriptive Statistics of Variables Measured Per Total Assets					
NETBE/TA	-.07112	-.06298	-.07926	.01628	4.5835***
FV1/TA	.00837	.00874	.00801	.00073	1.0291
FV2/TA	.16210	.15435	.16986	-.01550	-4.6575***
FV3/TA	.00515	.00564	.00466	.00098	1.8063*
FV23/TA	.16725	.15999	.17452	-.01452	-4.0192***
EPS/TA	.00007	.00017	-.00002	.00007	1.5277
Panel C: Descriptive Statistics of Variables Measured Per Market Capitalization					
NETBE/mv	-1.26366	-.98992	-1.53739	.54746	6.7157***
FV1/mv	.14139	.12116	.16163	-.04047	-2.2386**
FV2/mv	2.64307	2.28657	2.99957	-.71299	-7.5364***
FV3/mv	.07892	.08976	.06809	.02167	1.9883**
FV23/mv	2.72200	2.37634	3.06766	-.69132	-7.1603***
EPS/mv	-.04026	-.03892	-.04160	.00268	0.3496
Panel D: Descriptive Statistics of Variables Measured Per Number of Shares Outstanding					
NETBE/shares	-12.61768	-11.40757	-13.82779	2.42022	4.3095***
FV1/shares	1.17583	1.06501	1.28665	-.22164	-2.4387**
FV2/shares	25.57517	23.66895	27.48139	-3.81243	-6.0877***

FV3/shares	.76705	.77309	.76101	.01207	0.1870
FV23/shares	26.34223	24.44205	28.24241	-3.80036	-5.9056***
EPS/shares	.04626	.05058	.04193	.00864	0.4965

This table compares firms located in more religious counties to those located in less religious counties. Panel A reports statistics for selected variables. Panels B, C and D, provide descriptive statistics of the variables of interest, which are measured per dollar of total assets, dollar of equity, and share, respectively. TA is total assets. Mv is market capitalization. ROA is return on assets measured as net income divided by total assets. BM is the book to market ratio, measured as the ratio of the book value of shareholders' equity minus the book value of preferred stock to the market value of common shareholders' equity. Leverage is the debt-to-equity ratio, defined as long-term debt divided by market capitalization. σ(ROA) is a proxy for volatility, and it is measured by the standard deviation of ROA. All the other variables are defined in Table 3.

Table 5. Results of the Association between Religiosity and Value Relevance

	Total Sample	Religiosity_factor	Religiosity_average	Attendance	Affiliation	Importance
	PRC	PRC	PRC	PRC	PRC	PRC
Constant	2.5517***	4.1729***	3.9095***	4.2049***	4.0758***	3.3852***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)
EPS	5.1007***	5.0381***	4.9235***	5.0607***	4.8410***	4.7414***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
NETBE	0.4989***	0.3642***	0.3961***	0.3675***	0.3440***	0.4511***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
FV1	0.9882***	0.8885***	0.9439***	0.8162***	0.9062***	0.9678***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
FV23	0.5988***	0.4917***	0.5152***	0.4878***	0.4850***	0.5643***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
REL		-3.3467***	-2.7403***	-3.3921***	-3.2912***	-1.8498**
		(0.0001)	(0.0017)	(0.0000)	(0.0001)	(0.0134)
REL*EPS		-0.1004	0.1799	-0.1339	0.1984	0.6894
		(0.8113)	(0.6784)	(0.7534)	(0.5991)	(0.1500)
REL*NETBE		0.2413***	0.1769**	0.2331***	0.3128***	0.0983
		(0.0009)	(0.0210)	(0.0007)	(0.0000)	(0.1501)
REL*FV1		0.1825*	0.0745	0.3028***	0.1052	0.0468
		(0.0566)	(0.5071)	(0.0056)	(0.2479)	(0.6654)
REL*FV23		0.2016***	0.1513**	0.2086***	0.2359***	0.0762
		(0.0009)	(0.0173)	(0.0003)	(0.0002)	(0.1564)
Observations	5,592	5,592	5,592	5,592	5,592	5,592
R-squared	0.5353	0.5432	0.5408	0.5423	0.5490	0.5391

This table presents the results of the main regression. Religiosity is proxied by the religiosity factor, the simple average of the three individual religiosity measures, as well as each of the three individual religiosity measures. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 6. The Effect of Audit Quality on the Association between Religiosity and Value Relevance

	PRC
Constant	4.6116***
	(0.0000)
EPS	3.7096***
	(0.0004)
NETBE	0.3320***
	(0.0000)
FV1	0.5611***
	(0.0000)
FV23	0.4125***
	(0.0000)
REL	-3.5676***
	(0.0000)
REL*EPS	-0.6374
	(0.2193)
REL*NETBE	0.2975***
	(0.0001)
REL*FV1	0.0937
	(0.2528)
REL*FV23	0.2605***
	(0.0000)
BIG4	1.5141**
	(0.0127)
BIG4*EPS	2.1575**
	(0.0325)
BIG4*NETBE	0.0715
	(0.3824)
BIG4*FV1	0.4572***
	(0.0009)
BIG4*FV23	0.1253*
	(0.0777)
BIG4*REL	2.4455**
	(0.0137)
BIG4*REL*EPS	3.6342*
	(0.0533)
BIG4*REL*NETBE	-0.2178**
	(0.0388)
BIG4*REL*FV1	0.1563
	(0.2248)
BIG4*REL*FV23	-0.2162**
	(0.0289)
Observations	4,443
R-squared	0.6056

This table presents the regression results of the effect of audit quality on the association between religiosity and value relevance. The dummy variable *BIG4* is equal to one if the firm is audited by one of the Big Four auditors and zero otherwise. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in

parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 7. The Effect of the Firm Information Environment Quality on the Association between Religiosity and Value Relevance

	Analyst Coverage	**Analyst Forecast Error**	**Analyst Forecast Dispersion**
	PRC	PRC	PRC
Constant	5.5300***	2.3233***	2.8254***
	(0.0000)	(0.0000)	(0.0000)
EPS	3.8277***	3.0292***	2.9961***
	(0.0004)	(0.0000)	(0.0000)
NETBE	0.1121	0.3779***	0.3588***
	(0.1585)	(0.0000)	(0.0000)
FV1	0.5656***	0.7017***	0.9175***
	(0.0004)	(0.0000)	(0.0000)
FV23	0.2445***	0.5072***	0.4947***
	(0.0022)	(0.0000)	(0.0000)
REL	-3.2677***	-2.6371***	-3.7706***
	(0.0002)	(0.0008)	(0.0000)
REL*EPS	-0.5155	-0.3091	-0.0766
	(0.5077)	(0.4520)	(0.8919)
REL*NETBE	0.3913***	0.2091***	0.2313***
	(0.0001)	(0.0059)	(0.0018)
REL*FV1	0.0433	0.0018	0.0204
	(0.7766)	(0.9842)	(0.8881)
REL*FV23	0.3022***	0.1512***	0.1951***
	(0.0001)	(0.0069)	(0.0002)
DINF_ENV_QUALITY	-1.5522*	2.5952***	2.0210**
	(0.0815)	(0.0000)	(0.0320)
DINF_ENV_QUALITY*EPS	1.3611	8.6662***	10.1100***
	(0.1663)	(0.0042)	(0.0038)
DINF_ENV_QUALITY*NETBE	0.3403***	0.1319**	0.2292**
	(0.0015)	(0.0265)	(0.0180)
DINF_ENV_QUALITY*FV1	0.4014***	0.4467***	0.2260*
	(0.0083)	(0.0100)	(0.0568)
DINF_ENV_QUALITY*FV23	0.3247***	0.0608	0.1225
	(0.0008)	(0.3220)	(0.1588)
DINF_ENV_QUALITY *REL	0.4656	0.7701	3.3235**
	(0.5665)	(0.3941)	(0.0249)
DINF_ENV_QUALITY *REL*EPS	0.9521	12.5247***	-1.5885
	(0.2966)	(0.0044)	(0.6731)
DINF_ENV_QUALITY*REL*NETBE	-0.2635***	-0.3376***	-0.3595***
	(0.0072)	(0.0058)	(0.0016)
DINF_ENV_QUALITY *REL*FV1	-0.0039	-0.1726	-0.1721
	(0.9774)	(0.4215)	(0.4656)
DINF_ENV_QUALITY *REL*FV23	-0.1741**	-0.2638**	-0.1821*
	(0.0282)	(0.0182)	(0.0871)
Observations	5,592	3,749	2,773
R-squared	0.5691	0.6932	0.6984

This table presents the regression results of the effect of the firm information environment quality on the association between religiosity and value relevance. DINF_ENV_QUALITY is a dummy variable that is

equal to one if the quality of the information environment is high, and zero otherwise. I proxy for the quality of the information environment using analyst coverage, analyst forecast error and analyst forecast dispersion. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

CHAPTER V. ROBUSTNESS CHECKS

I perform three robustness tests. First, I check whether my results are due to differences in firm characteristics for firms located in more and less religious areas. In particular, I examine differences in (1) firms' operating behavior, (2) firms' illiquidity risk, (3) per share amount of firms' net assets valued using not-directly-verifiable inputs, and (4) the availability of valuation resources. Second, I address the concern that my results suffer from an omitted correlated variable problem. Third, I check whether my results are associated with urban/rural geographical locations instead of more/less religious areas. I also examine whether my results hold for Level 2 and Level 3 separately and whether my inferences remain the same when I restrict my sample to the after-financial-crisis period.

I. DIFFERENCES BETWEEN FIRMS LOCATED IN MORE AND LESS RELIGIOUS AREAS

Difference in the Operating Behavior

To rule out the alternative explanation that my findings are due to differences in the operating behavior between firms located in more religious areas and those located in less religious areas, I perform two tests. I rule out this alternative explanation for my findings in two different ways. First, I compare mortgage-backed-security (MBS) holdings that are available for sale between firms located in more and less religious areas, since Huizinga and Laeven (2009) find that MBS that are available for sale are discounted more than other securities. Second, I control for bank risk taking, as investors would

assign lower valuation multiples to firms taking more risk if they do not perceive that the fair value estimates are already adjusted for risk.

MBS holdings. Huizinga and Laeven (2009) find that in 2008, MBS that are available for sale are discounted 23 percent relative to other securities. If firms located in more religious areas hold less MBS than those located in less religious counties, the larger discount that investors apply to banks located in less religious counties could be due to their larger MBS holdings. To rule out this potential explanation of my results, I examine whether firms located in more religious counties and those located in less religious counties have comparable ratios of MBS carried at fair value to total assets. I gather data on MBS that are available for sale, and hence carried at fair value, from the Capital IQ database. I deflate those MBS by total assets and compare the resulting ratios between firms located in more religious areas and those located in less religious areas. I find that firms located in more religious areas have, on average, higher ratios of MBS available for sale to total assets (7.7 percent) than those located in less religious counties (7.1 percent). The difference is statistically significant at the one percent level. The fact that firms located in more religious areas hold more MBS than do firms located in less religious areas works against finding support for my hypotheses.

Risk taking. As was discussed on page 7, if SFAS 157 is properly applied, financial statement readers should not need to make any additional fair value adjustments based on the risk attributes of the firm that is holding a fair valued asset or has issued a fair valued liability. This robustness check allows for the possibility that investors do not fully realize this. If this is the case, they are likely to discount to a greater extent the fair value net assets of banks that take greater risk. Therefore, I examine whether my results

hold after controlling for bank risk taking. I do so by adding to my regression model a measure of risk taking, as well as its interaction with each of the determinants of price.

Following Saunders et al. (1990), I use market measures of bank risk taking—one measure of total risk and two measures of idiosyncratic risk. Total risk is proxied by the standard deviation of returns, and idiosyncratic risk is proxied by the standard deviation of the residual of a two index market model, as in Saunders et al. (1990). The two index market model is estimated using daily returns for each bank, the CRSP equally weighted market index and interest rate data for each quarter over the period of analysis. I use two alternative interest rate series: three-month Treasury bill and ten-year Treasury constant maturity, and require a minimum of 60 observations to estimate the two index market model.

The results after controlling for bank risk taking are summarized in Table 8. In the first column, bank risk taking is proxied by the logarithm of the standard deviation of stock returns. In the second and third columns, I use the logarithm of the standard deviation of the residual of the two index market model. In the second (third) column, I use the three-month Treasury bill (ten-year Treasury constant maturity) as a proxy for interest rate.

Controlling for firm risk taking, I still find that the coefficient of the interaction term between religiosity and FV23 is positive and statistically significant at the one percent level. Thus, my findings are not due to investors assigning lower valuation multiples for banks with higher risk taking.

Difference in illiquidity risk

Goh et al. (2009) argue that banks with stronger capital adequacy are less likely to need to sell their assets before maturity. Investors would then be less concerned about illiquidity risk for firms with stronger capital adequacy and would assign them higher valuation multiples. In accordance with their argument, Goh et al. find that the value relevance of the fair value estimates is higher for firms with larger tier-one capital ratios.

If firms located in more religious areas have stronger capital adequacy than those located in less religious areas, my results could be attributed to the difference in capital adequacy strength between the two subsamples. To tease out this alternative explanation, I compare tier-one capital ratios between the two subsamples. I find that the average tier-one capital ratio is 12.080 (12.117) in firms located in more (less) religious areas. The difference is not statistically significant, ruling out the potential explanation that my results are due to differences in illiquidity risk between the two subsamples.

Difference in the per share amount of FV23

The descriptive statistics reported in Table 4 show that firms located in more religious areas have more net assets valued using not-directly-verifiable inputs (FV23) per share than firms located in less religious counties. If firms with more assets and liabilities valued using not-directly-verifiable inputs offer more disclosure in the SFAS 157 notes or have greater valuation resources, my findings could be due to the difference in FV23 between the two subsamples and not to less bias in the fair value estimates. To rule out this alternative explanation, I test my regression model for a sample of firms with a comparable amount of net assets valued using not-directly-verifiable inputs. To do so, I

restrict my sample to observations with FV23 above the third quartile of the sample. The regression results are summarized in the first column of Table 9.

I find that my results still hold and are economically even more significant. Indeed, investors price one dollar of net assets valued using not-directly-verifiable inputs at 85.97 cents for firms located in more religious counties, and at only 42.63 cents for firms located in less religious counties. My results are not sensitive to the cut-off point chosen. I find that my inferences remain the same when I restrict my sample to firms with net assets valued using not-directly-verifiable inputs above the sixth, the seventh, the eighth, and the ninth decile. I focus only on firms with large amounts of FV23 because, when the amounts at stake are less economically significant, investors are less likely to be concerned with the bias in valuation. The results provided in Table 9 rule out the alternative explanation that firms located in more religious counties enjoy larger valuation multiples simply because they are likely to disclose more information in the notes to the financial statements, as a result of having more items valued using not-directly-verifiable inputs.

Difference in the availability of valuation resources

It is possible that my findings are due to firms located in more religious counties having greater valuation resources to value complex instruments, and not to religiosity, per se. Although data on valuation resources is not available, I rely on the Botosan et al. (2011) argument that larger banks are more likely to have greater valuation resources and examine whether firm size is different between firms located in more and less religious areas.[26]

[26] Botoson et al. (2011) argue that larger firms have greater valuation resources because they (1) have greater financial resources to obtain external talent, (2) can invest in in-house valuation capabilities due to

The descriptive statistics reported in Table 4 show that firms located in more religious counties have similar total assets and lower market capitalization compared with those located in less religious counties. Thus, firms located in less religious areas are likely to have equal or greater valuation resources than firms located in more religious areas.

II. OMITTED CORRELATED VARIABLE PROBLEM

One can argue that my results suffer from an omitted correlated variable problem. That is, my results are due to a variable that is highly correlated with religiosity and which is omitted from the model. To deal with this concern, I purge my religiosity measure from its known determinants and run my regressions again. I first regress the religiosity measure that I derived from the factor analysis on its determinants, namely population, median household income, level of education, average age, percentage of racial minority, and percentage of males in the county. Data on population and median household income come from the U.S. Census Bureau. All the other variables are from the Gallup interview responses. I use the residual from this regression as my purged measure of religiosity and rerun my regressions.

The results are summarized in Table 10. Panel A reports the correlation matrix between religiosity and a set of demographic variables that are known to be correlated with religiosity. Panel B reports the regression results of religiosity on its determinants. Panel C reports the regression results using the purged measure of religiosity. It shows that the coefficient of the interaction term between religiosity and net assets valued using not-directly-verifiable inputs is positive and statistically significant at the one percent

economies of scale, and (3) have more leverage to obtain information and data necessary to perform reliable valuations.

level. These results mitigate the concern that my findings suffer from an omitted correlated variable problem.

In unreported results, I also purge my religiosity measure from the percentage of the population who are affiliated with the Republican Party and still find support to my hypothesis.[27]

III. URBAN/RURAL FIRM LOCATION

Following McGuire et al. (2012) and Dyreng et al. (2012), I control for whether the firm is located in an urban/rural geographical area. I split my sample into two subsamples: the first subsample, urban, is composed of firms located in one of the ten largest Metropolitan Statistical Areas in the U.S.; the second subsample, rural, comprises the remainder of the sample.[28]

The results, reported in Table 11, show that the market pricing of net assets valued using not-directly-verifiable inputs is larger for firms located in more religious areas whether firms are located in urban or rural areas. These findings rule out the concern that my results are due to rural/urban firm location rather than more/less religiosity of the area in which the firm is located.

IV. OTHER ROBUSTNESS TESTS

I perform two additional robustness tests. First, I examine whether my main results hold for Level 2 and Level 3 net fair value assets separately. To increase the power of the test, I restrict my sample to observations with non-zero Level 3 net fair value and run my

[27] Republicans are more risk averse than democrats (see Hutton et al. 2010).

[28] The ten largest Metropolitan Statistical Areas in the U.S. are (1) New York-Northern New Jersey-Long Island, (NY-NJ-PA MSA), (2) Los Angeles-Long Beach-Santa Ana, (CA MSA), (3) Chicago-Joliet-Naperville, (IL-IN-WI MSA), (4) Dallas-Fort Worth-Arlington, (TX MSA), (5) Philadelphia-Camden-Wilmington, (PA-NJ-DE-MD MSA), (6) Houston-Sugar Land-Baytown, TX MSA, (7) Miami-Fort Lauderdale-Pompano Beach, (FL MSA), (8) Washington-Arlington-Alexandria, (DC-VA-MD-WV MSA), (9) Atlanta-Sandy Springs-Marietta, (GA MSA), and (10) Boston-Cambridge-Quincy, (MA-NH MSA).

regressions again. The results are reported in Table 12. I find that religiosity is positively associated with the value relevance of Level 2 as well as Level 3 net fair value assets when I proxy religiosity with the religiosity factor, the average religiosity measure, the attendance measure and the affiliation measure. Second, I restrict my sample period to after the 2008-2009 financial crisis. The results reported in Table 13 show that the positive association between religiosity and value relevance holds for the after-crisis period.

Table 8. Control for Bank Risk Taking

	Ln(sd_ret)	Ln(sd_res_S)	Ln(sd_res_L)
	PRC	PRC	PRC
Constant	-0.0134	4.5553	-0.6292
	(0.9965)	(0.1980)	(0.8327)
EPS	-9.0930***	-5.2939*	-9.9527***
	(0.0011)	(0.0809)	(0.0003)
NETBE	-0.1508	-0.0396	-0.1680
	(0.5185)	(0.8501)	(0.4682)
FV1	-0.8466*	-0.0753	-0.9241**
	(0.0583)	(0.8811)	(0.0349)
FV23	0.0328	0.1333	-0.0244
	(0.8863)	(0.5431)	(0.9174)
REL	-2.2299***	-2.5125***	-2.0268***
	(0.0005)	(0.0001)	(0.0007)
REL*EPS	-0.2455	-0.3830	-0.1793
	(0.5598)	(0.2909)	(0.6641)
REL*NETBE	0.1615***	0.1730***	0.1482***
	(0.0018)	(0.0010)	(0.0023)
REL*FV1	0.0893	0.1171	0.0693
	(0.2022)	(0.1024)	(0.2846)
REL*FV23	0.1340***	0.1458***	0.1228***
	(0.0021)	(0.0007)	(0.0027)
Risk	-1.1173	0.1642	-1.2967
	(0.2005)	(0.8621)	(0.1260)
Risk*EPS	-4.4615***	-3.4743***	-4.6215***
	(0.0000)	(0.0006)	(0.0000)
Risk*NETBE	-0.1581**	-0.1264**	-0.1612**
	(0.0182)	(0.0279)	(0.0150)
Risk*FV1	-0.5131***	-0.2948**	-0.5266***
	(0.0003)	(0.0380)	(0.0001)
Risk*FV23	-0.1336**	-0.1059*	-0.1470**
	(0.0399)	(0.0692)	(0.0280)
Observations	5,570	5,570	5,570
R-squared	0.6090	0.5759	0.6245

This table presents the regression results after controlling for bank risk taking. In the first column, bank risk taking is proxied by the logarithm of the standard deviation of stock returns (Ln(sd_ret)). In the second and third columns, bank risk taking is proxied by the standard deviation of the residual from the two index market model. In the second column, the three-month Treasury bill is used as a proxy for interest rate (Ln(sd_res_S)). In the third column, the ten-year Treasury constant maturity is used as a proxy for interest rate (Ln(sd_res_L)). The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 9. Regression Results for Firms with a Comparable Per Share Amount of Net Assets Valued Using Not-Directly-Verifiable Inputs

	(1)	(2)	(3)	(4)	(5)
	PRC	**PRC**	**PRC**	**PRC**	**PRC**
Constant	6.5436***	4.4742***	5.6408***	8.7345***	12.7653***
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)
EPS	7.0953***	6.5809***	6.8877***	7.7116***	8.3785***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)
NETBE	0.3357***	0.3990***	0.3456***	0.3296***	0.2480**
	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0250)
FV1	1.1963***	1.1437***	1.2146***	1.1840***	1.0932***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
FV23	0.4263***	0.4956***	0.4447***	0.3940***	0.2915***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0016)
REL	-12.1664***	-4.6980***	-9.7733***	-14.3340***	-27.6052***
	(0.0000)	(0.0014)	(0.0000)	(0.0000)	(0.0000)
REL*EPS	0.5854	-0.1586	-0.4766	-0.1488	-1.2812
	(0.6530)	(0.8439)	(0.6834)	(0.9116)	(0.4387)
REL*NETBE	0.4021***	0.1770**	0.3530***	0.4140***	0.4686***
	(0.0001)	(0.0286)	(0.0001)	(0.0001)	(0.0007)
REL*FV1	-0.0162	0.2243	-0.0579	-0.0586	0.0364
	(0.9080)	(0.1276)	(0.6775)	(0.6829)	(0.8584)
REL*FV23	0.4334***	0.1818**	0.3728***	0.4715***	0.6591***
	(0.0000)	(0.0158)	(0.0001)	(0.0000)	(0.0000)
Observations	1,398	2,236	1,677	1,118	559
R-squared	0.5281	0.5206	0.5309	0.5030	0.5176

This table presents the regression results after restricting the sample to firms with comparable net assets valued using not-directly-verifiable inputs. In the first, second, third, fourth and fifth column, I restrict the sample to observations with FV23 above the third quartile, the sixth decile, the seventh decile, the eighth decile and the ninth decile, respectively. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 10. Control for Demographic Variables

Panel A: Correlation Matrix

	Religiosity	Education	Minority	Male	Age	Ln_income	Ln_pop
Religiosity	1.0000						
Education	-0.5792 (0.0000)	1.0000					
Minority	-0.0692 (0.0000)	0.2682 (0.0000)	1.0000				
Male	-0.2535 (0.0000)	0.3462 (0.0000)	-0.0344 (0.0101)	1.0000			
Age	0.0284 (0.0334)	-0.1744 (0.0000)	-0.5161 (0.0000)	-0.1460 (0.0000)	1.0000		
Ln_income	-0.5344 (0.0000)	0.7396 (0.0000)	0.0993 (0.0000)	0.3851 (0.0000)	-0.0619 (0.0000)	1.0000	
Ln_pop	-0.3305 (0.0000)	0.4804 (0.0000)	0.6073 (0.0000)	0.1504 (0.0000)	-0.3091 (0.0000)	0.4041 (0.0000)	1.0000

Panel B. Regression Results of Religiosity on its Determinants

	Religiosity
Constant	10.3422*** (0.0000)
Education	-0.0349*** (0.0000)
Minority	0.0055** (0.0151)
Male	-0.0052 (0.4129)
Age	-0.0182* (0.0760)
Ln_income	-0.6540*** (0.0000)
Ln_pop	-0.0701*** (0.0002)
Observations	1,516
R-squared	0.3762

Panel C: Regression Results of the Association between Religiosity and Value Relevance Using a Purged Measure of Religiosity

	PRC
Constant	3.7449***
	(0.0000)
EPS	4.8259***
	(0.0000)
NETBE	0.3407***
	(0.0000)
FV1	0.7614***
	(0.0000)
FV23	0.4883***
	(0.0000)
REL	-1.5184**
	(0.0208)
REL*EPS	0.4975
	(0.3294)
REL*NETBE	0.2502***
	(0.0001)
REL*FV1	0.2490**
	(0.0151)
REL*FV23	0.1641***
	(0.0022)
Observations	5,384
R-squared	0.5355

Panel A reports the correlation matrix between religiosity and its determinants. Panel B presents the regression results of religiosity on its determinants and Panel C presents the results of my main hypothesis using the residual of the regression of religiosity on its demographic determinants. Education, Age, Minority, Male is the level of education, average age, percentage of racial minority and percentage of males in the county, respectively. Ln_income and Ln_pop is the logarithm median household income and population in the county, respectively. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 11. Partitioning on Firm Location

	Urban	**Rural**
	PRC	PRC
Constant	4.1089***	3.6660***
	(0.0000)	(0.0000)
EPS	5.5023***	4.7612***
	(0.0000)	(0.0000)
NETBE	0.2921***	0.4613***
	(0.0024)	(0.0000)
FV1	0.6306***	1.1508***
	(0.0001)	(0.0000)
FV23	0.4755***	0.5514***
	(0.0000)	(0.0000)
REL	-0.9929	-3.1030***
	(0.3819)	(0.0000)
REL*EPS	0.2395	0.0548
	(0.8979)	(0.9226)
REL*NETBE	0.6216***	0.1287***
	(0.0001)	(0.0032)
REL*FV1	-0.2519	-0.0729
	(0.2192)	(0.5244)
REL*FV23	0.3113***	0.1384***
	(0.0058)	(0.0002)
Observations	1,404	4,188
R-squared	0.6115	0.5363

This table presents the regression results after splitting the sample according to whether the firm is located in an urban or a rural area. It reports results for the subsample of firms located in urban areas (Urban) and the subsample of firms located in rural areas (Rural). The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust p-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

Table 12. Results of the Association between Religiosity and Value Relevance of Level 2 and Level 3 Net Fair Value Assets

	Religiosity_ factor	Religiosity_ average	Attendance	Affiliation	Importance
VARIABLES	PRC	PRC	PRC	PRC	PRC
Constant	4.3660***	4.3727***	4.5173***	3.6673***	3.4400***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0007)
EPS	5.2862***	5.1792***	5.2880***	4.7412***	5.1096***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
NETBE	0.2496***	0.2547***	0.2468***	0.2722***	0.3656***
	(0.0022)	(0.0063)	(0.0012)	(0.0012)	(0.0002)
FV1	0.6781***	0.6910***	0.5405***	0.5947***	0.8074***
	(0.0000)	(0.0002)	(0.0003)	(0.0001)	(0.0001)
FV2	0.4535***	0.4595***	0.4431***	0.4848***	0.5326***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
FV3	0.3004***	0.2876***	0.3759***	0.4118***	0.5750***
	(0.0016)	(0.0035)	(0.0004)	(0.0000)	(0.0000)
REL	-4.7545***	-4.3300***	-5.0158***	-3.6062***	-3.1497***
	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0053)
REL*EPS	-0.6088	-0.2612	-0.6197	0.3882	0.0833
	(0.2207)	(0.6299)	(0.1868)	(0.3981)	(0.8709)
REL*NETBE	0.4363***	0.3913***	0.4445***	0.4299***	0.2730***
	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0018)
REL*FV1	0.0478	-0.0221	0.2478**	0.2318*	-0.1494
	(0.6758)	(0.8761)	(0.0457)	(0.0658)	(0.3260)
REL*FV2	0.3285***	0.2851***	0.3501***	0.2891***	0.2061***
	(0.0000)	(0.0006)	(0.0000)	(0.0001)	(0.0066)
REL*FV3	0.4627***	0.4774***	0.3537***	0.2707**	0.1253
	(0.0004)	(0.0002)	(0.0036)	(0.0155)	(0.1838)
Observations	2,769	2,769	2,769	2,769	2,769
R-squared	0.6252	0.6227	0.6215	0.6230	0.6151

This table presents the results of the main regression after decomposing FV23 into FV2 and FV3. Religiosity is proxied by the religiosity factor, the simple average of the three individual religiosity measures, as well as each of the three individual religiosity measures. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

Table 13. Results of the Association between Religiosity and Value Relevance during the After Crisis Period

	Religiosity_ factor	Religiosity_ average	Attendance	Affiliation	Importance
VARIABLES	PRC	PRC	PRC	PRC	PRC
Constant	3.7694***	3.5764***	3.7946***	3.8963***	3.1273**
	(0.0040)	(0.0094)	(0.0035)	(0.0013)	(0.0134)
EPS	6.2530***	6.2241***	6.0494***	5.9363***	5.7552***
	(0.0006)	(0.0008)	(0.0009)	(0.0003)	(0.0010)
NETBE	0.3675**	0.3922**	0.3769***	0.3121***	0.4392***
	(0.0109)	(0.0144)	(0.0088)	(0.0076)	(0.0064)
FV1	0.8391***	0.9005***	0.7272***	0.8277***	0.9331***
	(0.0002)	(0.0007)	(0.0005)	(0.0003)	(0.0006)
FV23	0.4814***	0.4991***	0.4850***	0.4459***	0.5451***
	(0.0017)	(0.0026)	(0.0014)	(0.0008)	(0.0011)
REL	-4.0079***	-3.5765***	-4.0501***	-4.4543***	-2.7347**
	(0.0016)	(0.0067)	(0.0009)	(0.0001)	(0.0154)
REL*EPS	-0.9032	-0.7365	-0.5527	-0.6092	0.3736
	(0.3158)	(0.4350)	(0.5777)	(0.3930)	(0.6624)
REL*NETBE	0.2724**	0.2229*	0.2561**	0.4123***	0.1599
	(0.0208)	(0.0749)	(0.0224)	(0.0003)	(0.1449)
REL*FV1	0.2571**	0.1243	0.4560***	0.1865	0.0886
	(0.0409)	(0.4152)	(0.0044)	(0.2328)	(0.5606)
REL*FV23	0.2380**	0.2007*	0.2333**	0.3314***	0.1292
	(0.0145)	(0.0529)	(0.0118)	(0.0002)	(0.1311)
Observations	2,702	2,702	2,702	2,702	2,702
R-squared	0.6006	0.5982	0.6005	0.6106	0.5965

This table presents the results of the main regression for the after 2008-2009 crisis period. Religiosity is proxied by the religiosity factor, the simple average of the three individual religiosity measures, as well as each of the three individual religiosity measures. The dummy variable *REL* is equal to one if the firm is located in a more religious county, and zero otherwise. All the other variables are defined in Table 3. Robust *p*-values, in parentheses, are reported below the coefficients. *, **, and *** indicate significance at the 10, 5 and 1 percent level, respectively.

CHAPTER VI. CONCLUSION

This study examines whether religiosity is positively associated with the value relevance of fair value estimates. I find that the market assigns higher valuation multiples to fair valued items that are prone to managerial bias for firms located in more religious areas than for those located in less religious areas.

I also examine whether audit quality and the information environment quality of the firm moderate my results. I find that the positive association between religiosity and the value relevance of net assets that are prone to managerial bias is stronger in firms with lower audit quality and those with lower quality information environments.

I perform a battery of robustness tests. First, I rule out several alternative explanations of my results. In particular, I show that my results are not due to differences between firms located in more religious areas and those located in less religious areas with respect to (1) operating behavior, (2) illiquidity risk, (3) the per share amount of net assets valued using non-directly-verifiable inputs, and (4) valuation resources availability.

Second, I address the concern that my results suffer from an omitted correlated variable problem. Third, I rule out the possibility that my results are due to urban/rural geographical location. I also find that my results hold for Level 2 and Level 3 net fair value estimates measured separately and when I restrict my sample to the after-crisis period.

My results provide evidence that investors perceive that religiosity is negatively associated with managerial bias and that they take this into account when pricing the fair value estimates recognized in firms' financial statements. Moreover, assuming that investors are on average rational, my results provide indirect evidence that religiosity curbs measurer bias during the fair valuation process.

My findings are potentially of interest to auditors and regulators. They suggest that auditors should take into account firm location in planning their audits. In particular, they should implement more substantive testing of Level 2 and Level 3 fair values for clients located in less religious areas to offset managerial biases.

Future research could investigate whether the difference in national culture, in particular the Trust versus Distrust dimension, explains the cross sectional variation in value relevance of the fair value estimates across countries.

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