

# Bank CEO Materialism, Corporate Culture and Risk

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## Abstract

We posit that relative to more frugal CEOs, materialistic CEOs, as evidenced by the ownership of luxury goods, will exhibit greater proclivity for promoting aggressive risk-taking cultures. We document that the proportion of banks run by materialistic CEOs increased significantly from 1994 to 2004, coincident with significant bank deregulation. Using an index reflecting the strength of risk management functions (RMI), we find that RMI is significantly lower for banks with materialistic CEOs, significantly increases after a frugal CEO replaces a materialistic CEO, and decreases after a materialistic CEO succeeds a frugal one. We also find that banks with materialistic CEOs have significantly more downside tail risk relative to banks with frugal CEOs, where the difference between groups increased significantly during the recent crisis. Finally, we provide evidence consistent with non-CEO executives in banks with materialistic CEOs more aggressively exploiting inside trading opportunities around government intervention during the financial crisis relative to executives at banks with frugal CEOs.

**Keywords:** Executive materialism; corporate culture, bank risk.

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## 1. Introduction

Imprudent risk-taking and ethical lapses associated with the recent global financial crisis damaged public trust in the financial system and resulted in cumulative fines for global banks exceeding \$300 billion (McLannahan, 2015). A range of explanations for banks' behavior have been explored, including deregulation (e.g., Stiglitz, 2010), executive compensation (e.g., Bhagat and Bolton, 2014; Fahlenbrach and Stulz, 2011; Bebchuk et al., 2010), and corporate governance (e.g., Beltratti and Stulz, 2012; Mehran et al., 2011). There is growing consensus among policymakers and regulators that flawed corporate cultures within banking organizations contributed significantly to the crisis and loss of public trust in the financial system (e.g., Dudley, 2014; Financial Stability Board, 2014; Group of Thirty, 2015). Corporate culture is often defined as "a set of norms and values that are widely shared and strongly held throughout the organization" (O'Reilly and Chatman, 1996). The term *risk culture* refers specifically to the relevance of culture for risk-taking behavior within organizations (e.g., Power et al., 2013). An important research objective that has received limited attention by empiricists is to more deeply understand the contours and determinants of banks' risk cultures and empirically isolate relations between culture and bank risk.

In this paper, we take a step in this direction by examining the extent to which bank CEOs exert influence on the risk cultures of banking organizations as reflected in the strength and independence of banks' risk management function, downside tail risk and the behavior of non-CEO executives. Culture is a complex construct involving norms, attitudes and values. Directly measuring norms and values characterizing a risk culture is a daunting challenge facing empirical researchers. We sidestep this issue by focusing on choices that we conjecture to reflect a bank's culture and transmit values and attitudes of top management throughout an organization. Lo (2015) builds on the cultural theory of risk described in Douglas and Wildavsky (1992) to argue that observed risk priorities exhibited by an organization mirrors a corporate culture's values.<sup>1</sup> The Financial Stability Board (2014) notes that, among other things, a sound risk culture should emphasize throughout the institution the importance of ensuring that an effective system of controls is put in place.

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<sup>1</sup> The cultural theory of risk seeks to understand how a society's risk perceptions are shaped by how groups in a society interpret danger and build trust or distrust in institutions creating and regulating risk.

Building on these ideas, we posit that there is a relationship between a bank's culture and the risk management functions put in place by a bank's top leadership. We focus on bank CEOs based on the premise that a CEO's leadership, authority and decision-making (i.e., "tone from the top") represent critical inputs into shaping a financial institution's risk culture (e.g., Dudley, 2014; Group of Thirty, 2015; Lo, 2015). Further, O'Reilly (1989) notes that visible actions on the part of management in support of a firm's cultural values is an important mechanism for transmitting what is important to employees. The organizational design of a bank's risk management functions reflects top management's priorities and attitudes about risk, and these choices can transmit management's priorities and attitudes throughout the organization.

We specifically investigate how observed risk management policies and outcomes vary with bank CEO materialism. Based on the psychology literature, we interpret executives' personal ownership of luxury goods as a manifestation of relatively high materialism. This literature views materialism as distinct attitudes, traits or values underpinning a way of life in which an individual displays a strong attachment to worldly possessions and material needs and desires. It is the single-minded pursuit of happiness through acquisition or possession rather than through other means that distinguishes materialism (Richins and Rudmin, 1994).

One objective of our paper is to provide evidence on forces that shape corporate culture over time and across circumstances by focusing on CEOs as one potential catalyst of cultural change. Specifically, we consider the possibility that systematic shocks to the business environment drive a demand from firms for CEOs with characteristics that best fit the new environment, or change the composition of CEO types in the pool of available replacement CEO candidates. Either possibility or some could fundamentally alter the overall mix of CEO types running firms. In this regard, the 1990s saw significant regulatory changes in the U.S. financial sector. This includes branch banking deregulation in 1994 via the Interstate Banking and Branching Efficiency Act and the Gramm-Leach-Bliley Act in 1999 which allowed banks to more fully compete in insurance underwriting, securities brokerage, and investment banking. These regulatory changes significantly influenced bank competition (e.g., Rice and Strahan, 2010) and expanded banks' growth and risk-taking opportunities (e.g., DeYoung, 2013). While we are unaware of theories linking CEO materialism to more intense competitive and growth environments, we provide exploratory analyses examining whether bank deregulation coincides with a secular trend in the prevalence of materialistic bank CEOs running U.S. banks.

We document that between 1994 and 2004 the proportion of U.S. banks run by materialistic CEOs increased significantly in absolute terms and relative to non-financial firms.<sup>2</sup> Across all industries, the banking industry had the *lowest* proportion of materialistic CEOs in 1994 at 44% (equivalent to Utilities). However, by 2004 the banking sector transformed to having the *highest* proportion of any industry at 64% in 2004. This trend does not appear to be a wealth effect as it cannot be explained by trends in total CEO compensation or by differences in wealth levels between materialistic and non-materialistic CEOs. While bank CEOs' wealth-risk sensitivity, or "vega," did increase significantly relative to CEOs in non-financial firms (see also DeYoung et al., 2013 and Larcker et al., 2014), the vega of materialistic bank CEOs did not increase relative to those of non-materialistic CEOs.<sup>3</sup> Further, we do not observe significant trends in other CEO characteristics shown in the literature to influence corporate policy including overconfidence (Malmiender and Tate, 2005; 2008), narcissism (Ham et al., 2014), military service (Benmelech and Frydman, 2015), whether CEOs started their careers in recessions (Schoar and Zuo, 2015) or a record of legal infractions (Davidson et al., 2013).

Having established a significant increase in materialistic bank CEOs in the period preceding the financial crisis, we next examine whether CEO materialism is related to more aggressive risk-taking cultures. We hypothesize that relative to non-materialistic (frugal) CEOs, materialistic bank CEOs will exhibit a greater proclivity for promoting aggressive risk-taking cultures characterized by weaker risk control environments and more extreme lower tail risk. We build directly on the work of Ellul and Yerramilli (2013) who construct a risk management index (RMI) that increases in the strength and independence of risk management functions at banks. Ellul and Yerramilli show that RMI exhibits significant variation across banks, and that U.S. banks with higher lagged RMI have lower tail risk. We extend Ellul and Yerramilli (2013) by examining the extent to which RMI varies with bank CEO materialism. We find that RMI is significantly lower for banks with materialistic CEOs, both cross-sectionally and within banks over time. We also find that RMI significantly increases after a frugal CEO replaces a materialistic CEO and decreases after a materialistic CEO succeeds a frugal one, where there is no evidence of trends in RMI prior to switches in CEO types.

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<sup>2</sup> Subject to data availability, our sample focuses on publicly traded U.S. bank holding companies with stock market capitalization greater than \$1 billion during the years 1992-2013. We discuss the sample in more detail in section 3.

<sup>3</sup> Vega measures the change in the value of a CEO's firm-specific stock and option portfolio wealth for a 1% change in stock price.

We acknowledge that causal inferences are difficult as we do not randomly assign materialistic CEOs to banks. Our RMI results are consistent with either materialistic CEOs causing a change in RMI or with boards selecting materialistic CEOs as best suited to run banks post-deregulation (Fee et al., 2013). Consider the large increase in materialistic CEOs around bank deregulation discussed earlier. One explanation for this is that expanded risk-taking opportunities drew a disproportionate influx of materialistic executives into the pool of available CEO candidates making selection of materialistic CEOs statistically more likely. Alternatively, boards may have adopted new strategies favoring a particular CEO type, leading them to screen candidates based on observable style aspects associated with materialism. Consistent with boards actively matching CEO types to bank strategies, we find that the probability of a change in CEO type is significantly higher following forced CEO turnovers than for voluntary turnovers. However, the fact that we find no significant RMI trends in the year prior to CEO hiring suggests that even if boards endogenously select CEOs for their styles, materialism is important for implementing the new strategy.<sup>4</sup> In either case, CEO materialism seems to be a key ingredient in shaping the strength and independence of banks' risk management functions.

A key role of risk management is to mitigate the risk of large losses, motivating a focus on downside tail risk. We next examine relations between CEO materialism and two measures of downside tail risk. The first measure reflects the stand alone tail risk of individual banks, and is estimated as the average return over the 5% worst return days for the bank's stock in a given year.<sup>5</sup> Our second measure, designed to capture an aspect of systemic risk, captures the extent to which an individual bank's stock returns are low when overall market returns are low. We compute the marginal expected shortfall (*MES*) of the bank as the average return for an individual bank over the days that fall in the bottom 5% of overall market returns for the year (Acharya et al., 2010). We find that banks with materialistic CEOs have significantly more downside tail risk and *MES* relative to banks with non-materialistic CEOs. Further, the difference in risk between groups increased significantly during the recent crisis.

To the extent that materialism is associated with an almost single-minded pursuit of profits and materialistic CEOs drive culture, we would expect to this orientation to manifest in

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<sup>4</sup> See Schoar and Zuo (2015) for a related argument.

<sup>5</sup> This measure of tail risk is based on the expected shortfall (ES) measure that is widely used within financial firms to capture expected loss conditional on returns being less than some quantile cutoff (see Acharya et al., 2010). In our analysis, we take the negative of this measure so that higher values represent more tail risk.

the behavior and attitudes of non-CEO executives. Consistent with materialism operating through a culture channel, Davidson et al. (2013) find that materialistic CEOs, although not more likely to perpetrate fraud themselves, lead firms in which non-CEO insiders have relatively high probabilities of perpetrating fraud. Along similar lines, Davidson et al. (2014) conjecture that the corporate culture in firms run by materialistic (vs. frugal) CEOs is more conducive to profitable insider trading by other senior executives. They find that the profitability of purchases by non-CEO senior executives is relatively high in firms run by materialistic CEOs. In our final analysis, we examine whether non-CEO bank executives more aggressively exploit insider trading opportunities in banks run by materialistic CEO. Our analysis builds on Jagolinzer et al. (2014) who provide evidence that bank insiders' trades anticipate the effect of government intervention during the financial crisis on firms' share prices. We provide evidence consistent with non-CEO executives in banks with materialistic CEOs having a higher propensity to exploit inside trading opportunities around government intervention during the financial crisis relative to executives at banks with frugal CEOs.

Our paper makes several contributions. While a significant literature explores relations between CEO characteristics and corporate policy<sup>6</sup>, a novel contribution of our paper is in documenting a secular increase in the prevalence of materialistic bank CEOs coinciding with deregulation in the financial sector. This raises the possibility that deregulation contributed to the financial crisis through a culture channel by increasing the concentration of materialistic CEOs and thereby increasing the preponderance of aggressive risk cultures in the bank sector. Our paper is related to the work of Philippon and Reshef (2012) who study the allocation and compensation of human capital in the U.S. finance industry over the past century. They document a link between deregulation and the flow of human capital in and out of the finance industry, finding that financial deregulation is associated with skill intensity, job complexity, and high wages for finance employees. We complement Philippon and Reshef by examining whether the prevalence of materialistic CEO increased significantly around deregulation. Beyond skills and job complexity, our analysis raises the possibility that deregulation played a role in shifting bank risk cultures by changing the composition of CEO types running banks. These results also contribute to a recent literature examining connections between the business environment and changes in corporate culture involving increased fraud and corporate risk-taking behavior. Using

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<sup>6</sup> We discuss this literature in section 2 of the paper.

data on securities class action lawsuits to estimate the incidence of fraud from 1996 to 2004, Dyck et al. (2013) document an increasing amount of fraud as the stock market rose, and a corresponding decline following the bursting of the internet bubble in 2001–2002. In a related study, Deason et al. (2015) find that the number of Ponzi schemes prosecuted by the U.S. Securities and Exchange Commission increases during rising stock markets and decreases during declining markets.

We also add to the literature on culture in banking. Several recent papers provide evidence that risk cultures exhibit persistence. Fahlenbrach et al. (2012) find that a bank's stock return performance during the 1998 Russian debt crisis is related to its return performance and failure probability during the recent financial crisis. Cheng et al. (2015) find that residual compensation, measured as size and industry-adjusted compensation, is positively related to a bank's riskiness, and that residual compensation is highly persistent over time. Our result that RMI decreases (increases) after a CEO changes from frugal to materialistic (materialistic to frugal), suggests that risk culture persistence is a function of persistence in bank CEO type. Boissel et al. (2015) provide evidence that acquiring banks transfer their corporate culture in terms of loan loss provisioning policies to newly acquired subsidiaries, while Nguyen et al. (2015) show that the cultural characteristics prevailing in the country of a bank CEO's ancestors influences how banks respond to competitive pressures. Cohn et al. (2014) provide experimental evidence suggesting that the prevailing business culture in the banking industry weakens and undermines the honesty norm. We extend this literature by providing evidence consistent with materialistic CEOs exhibiting a greater proclivity for promoting aggressive risk-taking cultures.

The rest of the paper is organized as follows. Section 2 expands on the conceptual framework underlying our hypotheses about relations between CEO materialism and risk culture. Section 3 describes the sample, provides descriptive statistics and discusses our analysis of trends in CEO materialism over time. Section 4 presents our main empirical analyses on relations between materialism and both bank risk management and downside risk. Section 5 presents our results on the association between materialistic CEOs and the insider trading activities of non-CEO senior executives, and section 6 concludes.

## 2. Conceptual Framework and Prior Research

Hambrick and Mason's (1984) "Upper Echelons Theory" argues that a manager's experiences, values, and cognitive styles affect their choices and consequent corporate decisions. Consistent with this theory, Bertrand and Schoar (2003) document significant manager fixed effects with respect to corporate investment behavior, financing policy, organizational strategy, and performance. In this paper we examine relations between bank CEO materialism and banks' risk cultures. While the idea that an individual's personal characteristics can shape banks' risk culture has largely been unexplored in the banking literature, a number of prior studies have examined a range of specific managerial characteristics that are associated with corporate policies and firm performance. Characteristics examined include overconfidence (e.g., Roll, 1986; Malmendier and Tate, 2008, 2005; Schrand and Zechman, 2012), narcissism (e.g., Ham et al., 2014; Aktas et al., 2015), military service (Benmelech and Frydman, 2015), CEOs who start their careers in recessions (Schoar and Zuo, 2015), and a record of legal infractions (Davidson et al., 2013).<sup>7</sup> While in some sense materialism is just another characteristic among others, we posit that materialism is an important characteristic in its own right that has important implications for risk culture. Further, evidence in this paper and in Davidson et al. (2013) suggests that materialism is distinct from and largely orthogonal to these other CEO characteristics.

Materialism can be conceptualized as attitudes, traits or values that manifest in what people care about, what is important to them, and what ends they pursue in life (e.g., Fournier and Richins, 1991). Materialism is associated with a focus on trying to make money, accumulating possessions, or shaping the image a person projects to others (Kasser and Kanner, 2004). For example materialism has been described as a way of life characterized by a "devotion to material needs and desires" (Richins and Rudmin, 1994), "the importance one attaches to worldly possessions" (Belk, 1985), and "the worship of things" (Bredemeier and Toby, 1960). It is the single-minded pursuit of happiness through acquisition or possession rather than through other means that distinguishes materialism (Richins and Rudmin, 1994).

A single-minded pursuit of material possessions by materialistic individuals is also argued to be related to a loss of a sense of community which may in turn make them less sensitive to behaviors that might negatively affect others (Belk, 1988). Kilbourne and Pickett (2008) document that materialism has a negative effect on environmental beliefs, and these

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<sup>7</sup> See also Graham et al. (2013), Cronqvist et al. (2012), and Kaplan et al. (2012), among others,

beliefs affect environmental concern and environmentally responsible behaviors.<sup>8</sup> Davidson et al. (2015) find that firms led by materialistic CEOs have lower corporate social responsibility scores. Sidoti and Devasagayam (2010) provide evidence that materialism is positively associated with the propensity to take on more risk and with credit card misuse. Extrapolating from this evidence, we hypothesize that relative to less materialistic CEOs, materialistic bank CEOs will more strongly emphasize the pursuit of profits and personal wealth as preeminent corporate values. As a result, banks run by materialistic CEOs will have relatively more aggressive risk cultures that may subordinate concerns for the effects of a bank's decisions on the economy and other stakeholders. We follow Davidson et al. (2013) and view executives' personal ownership of luxury goods as a manifestation of relatively high materialism.

We want to emphasize that it is not our intention to argue that CEO materialism with its focus on profits and personal wealth is unambiguously bad. Rather, materialism is likely a double edged sword. On the one hand, the idea that self-interested behavior can lead to economic efficiency goes back to Adam Smith (1776/1976), and the profit motive lies at the heart of free market systems and underpins the creation of shareholder value. Given a firm's business environment, characteristics, governance structure, and stakeholder base, a materialistic CEO can represent the optimal fit for implementing a particular firm's business strategy. On the other hand, an extreme focus on profits that subordinates the interests of other stakeholders can impose significant externalities. A lack of concern for others has particular poignancy for the banking sector. Banks face distinctive challenges owing to tensions involved in balancing the demands of being value-maximizing entities with serving the public interest (Mehran and Mollineaux, 2012; Mehran et al., 2011). Materialistic bank CEOs that subordinate concerns for the effects of a bank's decisions on others can potentially expose the economy and taxpayers to significant externalities. In light of this, our objective is to examine whether the prevalence of materialistic bank CEOs changed over time in response to deregulation and the extent to which CEOs materialism shapes banks' risk cultures.

A key premise of our paper is that a bank's choices of risk management functions reflect the risk culture and transmits values and attitudes of top management throughout an

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<sup>8</sup> Kilbourne and Pickett (2008) focus on specific environmental beliefs and define them as beliefs an individual has regarding the existence of environmental problems such as water shortages, ozone depletion and global warming. They argue that concerns about the environment would not arise unless preceded by the belief that environmental problems exist.

organization. Our premise builds on Lo (2015) who argues that observed risk priorities exhibited by an organization mirror a corporate culture's values. We measure risk management using risk management index (RMI) developed by Ellul and Yerramilli (2013). RMI embeds two distinct aspects of a bank's risk priorities. First, RMI reflects a set of variables intended to measure the importance of the Chief Risk Officer, the official exclusively charged with managing enterprise risk across all business segments of the BHC) within the organization. Second, RMI reflects a set of variables intended to capture the quality of risk oversight provided by the BHC's board of directors. While the strength and independence of risk management functions is likely to have a direct impact on risk-taking driven by the effectiveness of risk controls in place, observed risk management functions may transmit top management's risk priorities across the organization. A system with a weak chief risk officer and weak board oversight may communicate that the bank values aggressive risk-taking with high profit potential with lower regard for tail risk.

Another premise of our paper is that there are explicit connections between materialism and culture. There is evidence that the level of materialism varies substantially across cultures (e.g., Ger and Belk, 1996; Eastman et al., 1997). A large literature in psychology and marketing considers the idea of a consumer culture driven by consumers' materialistic values. Kasser et al. (2004) refer to the underpinnings of a culture of consumption as a materialistic value orientation, which involves the widespread belief that it is important to pursue the culturally sanctioned goals of attaining financial success, having nice possessions, having the right image. Kanner and Soule (2004) argue that materialistic corporations transmit materialism to the culture of the larger society via a variety of mechanisms such as advertising and influence on higher education. Specifically with respect to corporate culture, Davidson et al. (2013) argue that if CEO materialism influences a firm's culture, then we should observe systematically different behavior for non-CEO employees of firm's run by a materialistic CEO. They find that materialistic CEOs, although not more likely to perpetrate fraud themselves, lead firms in which non-CEO insiders have relatively high probabilities of perpetrating fraud. Along similar lines, Davidson et al. (2014) conjecture that the corporate culture in firms run by materialistic (vs. frugal) CEOs is more conducive to profitable insider trading by other senior executives. Consistent with this, they find that the profitability of purchases by non-CEO senior executives is relatively high in firms run by materialistic CEOs. We build on this literature and hypothesize that non-CEO executives in banks with materialistic CEOs will have a higher propensity to exploit inside

trading opportunities around government intervention during the financial crisis relative to executives at banks with frugal CEOs.

### **3. Sample, descriptive statistics and analysis of trends**

#### *3.1. Sample and data*

We collect our data from several sources. Our data on CEOs' ownership of vehicles, boats, and real estate are obtained from numerous federal, state and county databases accessed by licensed private investigators. We augment our real estate data by hand collection of public information primarily from county tax assessor websites.<sup>9</sup> In order to assure ourselves that we are adequately capturing all luxury assets owned by an individual, we collect real estate data from title/ownership searches as well as by looking up property records from an individual's address history. The latter procedure allows us to include property that may be in the name of a spouse or held by a trust and allows us to include properties that an individual raised as new construction (for which we estimate property value based on an average of several real estate databases). For individuals who rent instead of own real estate (for instance, executives in Manhattan), we obtain estimates of property values based on the records for the condominium units in the building. Our vehicle data is based in part on insurance documents which show an individual is insured to drive a vehicle. This allows us to consider vehicles that may be owned in another's name.

We measure an executive's materialism by setting an indicator variable, *MATERIAL*, equal to 1 if the CEO owns luxury assets prior to December 31, 2013, where luxury assets include cars with a purchase price greater than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of his firm's corporate headquarters, any additional residences worth more than twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)), and 0 otherwise.<sup>10</sup>

Cluster analysis, including Jenks natural breaks classification method (Jenks 1967), suggest that \$75,000 and 25 feet represent natural breaks in the distribution of values for car

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<sup>9</sup> Our acquisition and use of asset data conforms to all provisions of the Driver's Privacy Protection Act (DPPA).

<sup>10</sup> We include a CEO's luxury asset purchases regardless of when they occur to define *MATERIAL* for that CEO. This is based on our assumption that type is stable and revealed with a delay, and our desire to minimize the number of materialistic CEOs classified otherwise.

prices and boat lengths respectively. In sum, the Jenks method attempts to arrange data into groups by reducing variance within groups and maximizing variance between groups. Step detection, though often used for time series data, identifies jumps in the levels of a distribution and yields similar inferences to the Jenks method. Discontinuity analysis on car prices and boat length suggests that our cutoffs represent natural breakpoints in the distributions of those values for our sample. Nevertheless, in order to verify whether the statistical and economic significance of our results on materialism are sensitive to these measurement choices, we verify that our results are robust to using an alternative measure, where the indicator *MATERIAL* takes a value of 1 if the CEO owns cars with a purchase price in excess of \$110,000, boats greater than 40 feet in length, a primary residence worth 5 times the average of the median home price in zip codes within 15 miles of his firm's corporate headquarters or additional residences worth 5 times the median value of homes in that property's CBSA, and 0 otherwise. We also obtain similar results in our analyses when we use a continuous measure of materialism, defined as the sum of the dollar values of an executive's car(s), boat(s) and primary residence in excess of twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and the value of any additional residences as of December 31, 2013.<sup>11</sup>

We obtain consolidated financial information of bank holding companies (BHCs) from the FR Y-9C reports that they file with the Federal Reserve System. We gratefully acknowledge the data on the risk management function at BHCs from Andrew Ellul and Vijay Yeramilli. Ellul and Yeramilli (2013) use information from the 10-K statements, proxy statements and annual reports of BHCs to construct a unique risk management index (RMI) which measures the organizational strength and independence of the risk management function at each BHC for each year. The index is constructed by taking the first principal component of the following risk management variables: 1) if a Chief Risk Officer (CRO) responsible for enterprise-wide risk management is present within the BHC or not; 2) if the CRO is an executive officer of the BHC or not; 3) if the CRO is among the five highest paid executives at the BHC or not; 4) the ratio of

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<sup>11</sup> We choose to report our results using the binary measure for the following reasons. First, a binary measure is needed in our model of CEO transitions. Second, analyses requiring the summation of coefficients are more meaningful and offer a clearer interpretation with a binary measure. Third, boat prices were not provided to us and need to be estimated which calls into question the accuracy of that component. And finally, summing the dollar values of different assets on a one-to-one basis is not likely an accurate measure of the degree of materialism (for instance, someone with a \$300,000 car and \$700,000 home may not represent the same level of materialism as someone with a \$50,000 car and a \$950,000 home). The results using the continuous measure are available on request.

the CRO's total compensation, excluding stock and option awards, to the CEO's total compensation; 5) if at least one of the independent directors serving on the board's risk committee has banking or finance experience; and 6) if the BHC's board risk committee met more frequently during the year compared to the average board risk committee across all BHCs (see Ellul and Yeramilli (2012) for details on the construction of RMI).

We obtain data on stock prices from the CRSP database, which we use to compute our two measures of downside risk, i.e., tail risk and marginal expected shortfall, as well as measures of annual returns and volatility of returns. Tail risk reflects the stand alone risk of individual banks, and is estimated as the average return on a bank's stock over the 5% worst return days for the bank's stock in a given year (we consider the negative of this measure so higher values indicate higher tail risk). The marginal expected shortfall (Acharya et al., 2010) is a measure of systemic risk and we compute it as the average return for an individual bank over the days that fall in the bottom 5% of the S&P500 returns for the year (as before, we consider the negative of this measure). Finally, financial accounting data employed to compute various firm characteristics and CEO compensation data to compute executive wealth, the sensitivity of CEO compensation to stock prices (delta) and the sensitivity of CEO compensation to stock return volatility (vega) are obtained from the Compustat and ExecuComp databases respectively.

Due to the high cost of background checks on asset ownership we purchase data only for CEOs at financial institutions with market capitalization of greater than \$1 billion whose tenures extend beyond 1992.<sup>12</sup> Table 1 describes our final sample, which comprises 284 firms in the financial services sector and 445 CEOs in total over the period 1992–2013. This includes 89 firms for which we have data for at least two CEOs, which allows us to analyze changes in risk management policy following a CEO change. Table 1, also summarizes the distribution of luxury assets. Of the 445 CEOs in the sample, approximately 58% are materialistic.

### *3.2. Descriptive statistics*

We present summary statistics of the key financial, risk, and executive compensation variables for the firms used in our analyses in Table 2, panel A (columns (1) through (3)). See the Appendix for detailed descriptions of these variables. To better understand the differences in

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<sup>12</sup> We also exclude Interim CEOs who held the title of CEO for less than 1 fiscal year.

these characteristics between firms led by materialistic CEOs vs. frugal CEOs, we compare the means of these variables in columns (4) and (5). Some key observations are as follows.

We observe that the average delta of the materialistic CEOs is significantly lower than those of the frugal CEOs while the average vega is not significantly different across CEO type. On average, firms led by materialistic CEOs have significantly higher non-interest income, higher commercial and industrial loans, higher deposits and more mortgage backed securities as a proportion of total assets as compared to those in banks led by frugal CEOs. More interestingly, the average RMI of firms with materialistic CEOs is significantly lower than that of firms led by frugal CEOs. In fact, the RMI for firms led by materialistic CEOs is lower by 0.140, which is almost half the sample standard deviation for RMI. This is consistent with our main hypothesis regarding the relation between CEO materialism and risk management functions in BHCs. Next, consider the two measures of downside risk. We observe that banks with materialistic CEOs have significantly higher tail risk and higher average marginal expected shortfall (vs. firms with frugal CEOs). The average of 0.051 (0.032) on tail risk (marginal expected shortfall) for firms led by materialistic CEOs indicates that the mean return on the average BHC stock on the 5% worst return days for the BHC's stock (for the S&P500) during the year is -5.1% (-3.2%). The corresponding tail risk for banks led by frugal CEOs is -4.7% (-2.9%). In other words, a firm led by a materialistic CEO has on average -5.2% (-3.9%) lower returns over the 5% worst return days for the bank (S&P500).

None of the other variables are significantly different across the two groups of firms. Interestingly, we do not find that these two groups of firms are different in terms of size, thus reducing the likelihood that differences in size is related to differences in risk-taking activities and hence differences in the risk-management.

One potential concern is that wealthier executives are more likely to be materialistic because they have the means to acquire luxury assets. Further, if greater wealth makes executives less risk-averse, then that could induce materialistic executives to pursue more aggressive risk-taking strategies. To examine the relation between an executive's wealth and his materialism we conduct the following analyses. We calculate a firm-based measure of an executive's wealth using data from ExecuComp and Thomson Reuters that considers: historical cash compensation, the value of current option and restricted stock holdings, the value generated from historical option exercises, deferred compensation and the value of long-term incentive plans, and profits

from open market transactions. Next, we form executive wealth deciles and examine whether the proportion of materialistic CEOs are more highly concentrated in the higher wealth buckets. Table 2 Panel B presents the results of this analysis. We find that the percentage of materialistic CEOs is similarly distributed across the various wealth deciles (in fact the highest percentages of materialistic CEOs seem to be concentrated in the middle deciles). Further, the percentage of materialistic CEOs is similar in the top 50% and the bottom 50% of the wealthiest CEOs. We also find that the correlation between *MATERIAL* and executive wealth is insignificantly different from zero, further reducing any potential concern that an executive's wealth is likely to be affecting our results.

In sum, while the above univariate differences do not control for other key BHC characteristics that may affect bank risk-taking, they support our primary theory on the positive association between CEO materialism and aggressive risk-taking cultures in banks. We test this association more formally in a multivariate setting in section 4.

### *3.3 Deregulation in the Banking Sector and Trends in CEO types*

We begin our examination by first exploring the ideas observed by Douglas and Wildavsky (1992) and discussed in Lo (2015) that corporate culture is influenced by its environment, including regulatory requirements, and changes in the environment can alter culture. Our sample period covers two significant changes in the financial sector due to deregulation. These include branch banking deregulation in 1994 via the Interstate Banking and Branching Efficiency Act and the Gramm-Leach-Bliley Act in 1999 which allowed banks to more fully compete in insurance underwriting, securities brokerage, and investment banking. These changes enhanced competition in the financial services sector by removing barriers in the market among banking companies, securities companies and insurance companies that prohibited any one institution from acting as any combination of an investment bank, a commercial bank, and an insurance company. This deregulation expanded opportunities for risk-taking and growth and is likely to have attracted certain types of individuals in leadership roles in banks. We plot the trend in materialistic CEOs over this time period to examine whether these shifts in the environment corresponded with a higher proportion of materialistic executives accepting chief executive officer positions in the banking industry.

Figure 1 graphically presents the trend in CEO type in the banking industry. We find a rise in the prevalence of materialistic CEOs in the banking industry after 1994, with a dramatic increase beginning in 1998 with the trend peaking in 2004. An analysis of CEO turnovers during this period does not indicate a change in the total number of turnovers during these years (see Table 2, panel C). So it seems that while the turnover rate remained stable over time, banks that had turnovers were much more likely to hire a materialistic CEO. Specifically, the banking industry had the lowest proportion of materialistic CEOs in 1994 at 44% (equivalent to Utilities), and the highest proportion of 64% in 2004. Non-banks, on the other hand remained relatively stable (ranging between 52-57%) over the entire sample period, with the average actually decreasing slightly after 1999.

This shift in the composition of executives in the banking sector following deregulation raises several interesting questions, including, what caused this shift and what are the implications of such changes in bank leadership for bank culture? One possibility is that bank deregulation coincided with changes in the total compensation and incentives offered to bank CEOs (vs. non-bank CEOs). Such changes in executive compensation incentives could be one potential explanation for attracting certain types of CEOs as well as any subsequent risk-taking consequences in banks. We examine this next.

Figure 2 suggests that trends in total compensation offered to CEOs (calculated as the sum of the salary, bonus, the total value of restricted stock granted, the total value of stock options granted (using Black-Scholes), any long-term incentive payouts, and any other forms of annual compensation received by the CEO) are not a likely explanation for shifts in executive composition. In fact, the trends in total compensation offered to CEOs in banks and non-banks move parallel to each other, peak in 1999 and have a downward trend thereafter. While bank CEOs have traditionally received higher total compensation relative to non-bank CEOs, the total compensation for bank CEOs falls below that for non-bank CEOs post-2008. Further, differences in compensation levels between materialistic and frugal CEOs are not significant enough to drive such shifts in composition.

Next we plot the changes in CEO wealth-risk sensitivity, or vega, for CEOs over time in Figure 3. We observe that bank CEO vega increased significantly relative to CEOs in non-financial firms between 1999 and 2002 (but declined thereafter). Note that the surge in materialistic CEOs preceded this trend in vega, and so the increased vega did not initiate the

substantial entry of materialistic CEOs into the financial services sector. Further, the vega of materialistic bank CEOs did not increase relative to those of frugal CEOs in the financial services sector. Taken together, these trends imply that the changes in compensation packages are unlikely to have spurred the change in the composition in executive type or the ensuing changes to corporate culture in this industry.

Finally, we examine whether in addition to materialistic CEOs, deregulation initiated the advent of other types of individuals in the banking sector. In Figure 4 we plot trends in a range of CEO characteristics that have received attention recently in the literature – namely overconfidence (Malmindier and Tate, 2005; 2008), narcissism (Ham et al., 2014), whether a CEO was in military service (Benmelech and Frydman, 2015), whether a CEO started his career in a recession (Schoar and Zuo, 2015) or whether he had a record of legal infractions (Davidson et al., 2013).<sup>13</sup> As is evident from Figure 4, we do not observe any significant trends in any of these CEO characteristics. Only CEO materialism trends with deregulation.

The above analyses provide compelling evidence of a secular shift in the composition of the type of CEOs in the banking industry post-deregulation. This evidence of a dramatic shift in CEO materialism in banks provides added ground for examining the hypothesis that CEO materialism is related to more aggressive risk-taking cultures. We examine this in a multivariate setting in the next section.

## 4. Empirical Analyses

### 4.1. CEO Materialism and Bank Risk Management

To test our first hypothesis we examine whether the risk management function in BHCs (as proxied by RMI) varies with CEO type. We estimate the following model with year fixed effects:

$$RMI_{i,t} = \beta_0 + \beta_1 MATERIAL_{i,t-1} + \beta_2 CONTROLS_{i,t-1} + Year\ FE + \varepsilon_{i,t} \quad (1)$$

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<sup>13</sup> We measure these traits based on the prior literature cited above. A CEO is considered overconfident if he is a net acquirer of shares. We modify the measure as net purchases after the 4th year of tenure over the next four years in order to obtain sufficient observations. We measure narcissism by the area covered by a CEO's signatures called by the number of letters in his name. Military is measured based on whether a CEO has military experience, and the variable recession is measured based on whether a CEO entered the labor market during a recession. A CEO is considered to be a recordholder if he has any legal infractions, where legal infractions include driving under the influence, other drug-related charges, domestic violence, reckless behavior, disturbing the peace, and traffic violations (including speeding tickets).

where  $RMI_{i,t}$  is the risk management index for BHC  $i$  in year  $t$ , and  $MATERIAL$  is a dummy variable that equals 1 if the CEO of the BHC is materialistic (as defined earlier). We follow Ellul and Yeramilli (2013) in including important financial characteristics that may affect RMI (see the Appendix for detailed descriptions of all variables). Specifically, we include past annual returns, the volatility of past returns and beta to control for past profitability and risk. We include the size of the BHC (measured as the natural log of total assets) as it is likely to be an important determinant of RMI. Ellul and Yeramilli (2013) contend and show that there is a non-linear relation between RMI and size, and as such we include both size and size squared as controls. The various balance sheet variables we include are tier 1 capital, loans past due for 90 days or more and non-accrual loans, commercial and industrial loans, consumer loans, mortgage loans, and total deposits. All of these variables are scaled by the total assets of the firm. We also include variables to control for maturity mismatch, which is the ratio of deposits and short term borrowings less cash to total liabilities, the market capitalization to the book value of shareholders equity, the ratio of non-interest income to the sum of interest and non-interest income, trading assets and mortgage backed securities (the latter two scaled by total assets). We also control for CEO compensation characteristics by including the CEO delta and CEO vega in the model. Including all of the above controls results in a notable loss of observations, and so we present results with all controls as well as results with certain controls which have little effect on sample size. The main results are consistent across all models and we discuss the main observations below.

Table 3 presents the results. For all models, the coefficient on  $MATERIAL$  is negative and statistically significant (at the .05 level or better), supporting our prediction of a negative association between CEO materialism and the strength of the risk management function at BHCs. Taking an average of the coefficients across the various models, we find that having a materialistic CEO lowers RMI by 0.143, which corresponds to 43% of the sample standard deviation of RMI (which is 0.33). Thus, having a materialistic CEO (vs. a frugal one) is associated with RMI being lower by almost half the sample standard deviation, which is similar to our findings in the univariate analysis.

Among the control variables, the results are somewhat varied across models for some of the variables, but consistent for others. Some key observations are as follows. We find a significant negative association between RMI and volatility in three (out of six) models,

indicating that higher quality risk management is associated with less volatile returns. Size is positive and significant in one model, suggesting that larger BHCs have higher RMI. However, it is negative and significant (although marginally) in one model and insignificant in others. We find some evidence of a concave relation between size and RMI as in Ellul and Yeramilli. CEO vega is positive and significantly associated with RMI in two models. This is intuitive and suggests that BHCs in which CEO wealth is more sensitive to volatility in returns have higher RMI.

#### 4.2 Predecessor-Successor Analysis

To provide more evidence on how RMI varies by CEO type and to reduce potential endogeneity concerns, we estimate equation (2) to examine RMI before and after a change in CEO distinguished by predecessor and successor type:

$$\begin{aligned}
 RMI_{i,t} = & \beta_0 + \beta_1 \text{NEW CEO MATERIAL}_i + \beta_2 \text{SUCCESSOR}_{i,t} \\
 & + \beta_3 \text{CHANGE CEO TYPE}_i + \beta_4 \text{NEW CEO MATERIAL}_i * \text{SUCCESSOR}_{i,t} \\
 & + \beta_5 \text{NEW CEO MATERIAL}_i * \text{CHANGE CEO TYPE}_i + \beta_6 \text{SUCCESSOR}_{i,t} * \text{CHANGE CEO} \\
 & \text{TYPE}_i + \beta_7 \text{NEW CEO MATERIAL}_i * \text{SUCCESSOR}_{i,t} * \text{CHANGE CEO TYPE}_i \\
 & + \beta_8 \text{CONTROLS} + \text{YEAR FE} + \varepsilon_{i,t} , \tag{2}
 \end{aligned}$$

where *NEW CEO MATERIAL* is a dummy variable that equals 1 if the new CEO is materialistic and 0 otherwise, *SUCCESSOR* is a dummy variable that equals 1 if RMI is measured once the new CEO is in office and is 0 otherwise, and *CHANGE CEO TYPE* is a dummy variable that equals 1 if there is a change in CEO type from the predecessor to the successor and 0 otherwise. We exclude the transition year, during which both the predecessor and successor are present, from the analysis because it is likely that the RMI score is a function of both CEOs decisions. We estimate equation (2) both with and without control variables. We include the same control variables in equation (2) as we did in equation (1) and do not discuss those in this section for the sake of brevity. Including the control variables again results decreased sample size, and therefore we report results both with and without these variables. The results are similar for both models.

Table 4 reports the results of estimating equation (2) as well as an analysis of the change in RMI based on the transitions in CEO type. We find that the RMI increases significantly (at

the .01 level) after a materialistic CEO is replaced by a frugal CEO. This is consistent with frugal CEOs investing in strengthening the risk management function in their banks once they assume office. Analogously, RMI decrease significantly (though only at the .10 level) when a frugal CEO is replaced by a materialistic CEO. The lower significance level is intuitive in this case; it is likely more difficult (and perhaps takes a longer time) to weaken an existing strong risk-management function in a bank. The corresponding changes in RMI associated with other transitions (frugal → frugal and materialistic → materialistic) are not significant. A test of the differences in RMI due to the various transitions reveals that transitions from materialistic to frugal CEOs, and those from frugal to materialistic CEOs, significantly dominate the changes in RMI due to all other transitions.

The above results further reinforce our inferences on the hypothesized effect of CEO materialism on the strength of the risk-management function in banks. We note that ideally we would conduct this analysis on a sample of exogenous CEO turnovers (transition due to predecessor death being the strongest example). However, that sample of turnovers is too small to analyze. Nevertheless, using all CEO transitions in our sample does not preclude our identification purpose. While it is possible that boards hired materialistic CEOs during this period to actively change the bank's operating strategy towards more aggressive risk-taking, there would be no reason for the risk-management function to be weakened simultaneously. If anything, the reverse should be true. And while a board may hire a frugal CEO in part to strengthen risk management, it seems unlikely boards would hire materialistic CEOs for the express purposes of weakening risk management. In fact, to further examine whether boards were actively matching CEO types to bank strategies, we test and find that the probability of a change in CEO type is significantly higher following forced CEO turnovers than for voluntary turnovers. Forced turnovers lead to a change in CEO type 53% of the time while routine turnovers lead to a change in type 33% of the time. This difference is significant at the 1% level. We note, however, that there is no significant RMI trends in the year prior to CEO hiring.<sup>14</sup> Overall, our results in this section indicate that CEO materialism is an important factor in influencing banks' risk management functions.

### **4.3. CEO Materialism and Downside Risk**

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<sup>14</sup> This result is unreported for brevity, but available on request.

In our next set of analyses we examine the association between CEO materialism and the outcomes of banks' risk-management systems, as evident in downside tail risk. We consider two measures of downside tail risk: 1) the stand alone tail risk of individual banks (*TAIL RISK*); and 2) the marginal expected shortfall, capturing the extent to which an individual bank's stock returns are low when market returns are low (*MES*). We estimate the following regressions:

$$TAIL\ RISK_{i,t} = \beta_0 + \beta_1\ MATERIAL_i + \beta_2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \quad (3)$$

$$MES_{i,t} = \beta_0 + \beta_1\ MATERIAL_i + \beta_2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \quad (4)$$

where the dependent variables are the two measures of downside risk, *MATERIAL* is a dummy variable that equals 1 if the CEO is materialistic, and the control variables are those used in equations (1) and (2).

Table 5 presents the results for *TAIL RISK* and Table 6 present the results for *MES*. The tests and results for both are similar and for brevity we discuss them together. In the first column, we replicate the analyses in Ellul and Yeramilli (2013) and present the results without including the variable *MATERIAL* on the right hand side, but include the lagged *RMI* of the BHC instead. In the second column, we include *MATERIAL* but exclude *RMI*. In the next two columns we include *MATERIAL* and *RMI* as well as the various control variables (as before we report results both with and without certain controls due to data limitations).

The results in the first column are consistent with those in Ellul and Yeramilli – we also find a negative and significant coefficients for *RMI* for both dependent variables (at the .05 level), indicating that BHCs that had stronger risk management controls in place the previous year have lower tail risk and lower marginal expected shortfall in the current year. When we include *MATERIAL* but exclude *RMI*, we obtain positive and significant coefficients for *MATERIAL* in both cases as well (at the .01 level), indicating that the tail risk and marginal expected shortfall are significantly higher for BHCs with materialistic CEOs vs. those for BHCs with frugal CEOs.

Interestingly, in the next two models when both *MATERIAL* and *RMI* are included, *MATERIAL* continues to be significant (at the .05 level or better), but *RMI* loses significance. One interpretation of this result is that CEO materialism has a first order effect on a bank's downside risk and one channel through which it impacts downside risk is through the bank's risk-management function. Therefore, when we control for both the CEO type and *RMI*, *RMI* loses significance. This idea does not take away from the result on the relation between *RMI* and

downside risk, but adds to it by suggesting that CEO materialism is an essential factor as the CEO is the key person in influencing the bank's risk-management function.

In sum, we find support for the hypotheses that materialistic CEOs are associated with significantly higher tail risk and marginal expected shortfall. In fact, the results indicate that having a materialistic CEO (vs. a frugal CEO) increases *TAIL RISK* as well as *MES* by approximately 20 basis points (which correspond to 260 basis points over 13 days corresponding to the 5% worst return days for the bank and the S&P500).

Among the control variables, in the *TAIL RISK* model, we obtain some evidence of a positive and significant coefficient for *SIZE\_SQUARED*, as in Ellul and Yeramilli (2013). As they suggest, this indicates that the largest BHCs perhaps take on excessive tail risks in anticipation of being bailed out in the event of a financial crisis. The coefficient on *SIZE* however, is negative and significant. The coefficients on *RETURN* are negative and significant across all models, suggesting that banks with a higher past stock performance have lower tail risk. BHCs with more volatile returns and higher betas have higher tail risks. Also consistent with Ellul and Yeramilli, we find that banks with more tier 1 capital are riskier and those with more non-performing loans have higher downside risk. There is also some evidence that banks with less mortgage loans, less trading assets, a lower ratio of deposits and short term borrowings less cash to liabilities and higher proportion of non-interest income have more tail risk. Finally, while Ellul and Yeramilli do not detect any significant relations between CEO compensation characteristics and tail risk, we find some evidence that CEO vega is negative and significantly associated with tail risk, while delta is positive and significantly associated with tail risk.

While the results for the control variables are generally similar for *MES*, there are some differences. In this case we obtain evidence of a positive and significant coefficient for *SIZE* and a negative and significant coefficient for *SIZE\_SQUARED* and a positive a significant coefficient for *SIZE*, indicating a non-linear relation between firm size and our measure of systemic risk. Also, in this case we find that CEO vega is positive and significant, though the coefficients lose significance once all control variables are included. Thus, it seems that vega is associated with higher systemic risk, but with lower tail risk. This is consistent with results in Armstrong and Vashishtha (2012) and DeYoung et al. (2015) who show that managers vega is associated with managers making investments that increase the systematic risk of the firm.

In sum, the above analyses indicate that banks with materialistic CEOs have significantly more downside tail risk and a higher marginal expected shortfall relative to banks with frugal CEOs.

We probe deeper into the effects of CEO type on a bank's downside risk by examining how banks with materialistic CEOs fared during the recent financial crisis vs. the non-crisis period. Specifically, we estimate the following regressions for both the crisis years (2007-2008) and the non-crisis years (the other years in the sample period):

$$\begin{aligned}
 TAIL\ RISK_{i,t} / MES_{i,t} = & \beta_0 + \beta_1 MATERIAL_i + \beta_2 CONTROLS \\
 & + Year\ FE + \varepsilon_{i,t}
 \end{aligned}
 \tag{5}$$

Table 7 presents the results of the above analyses. The results are similar for both measures of downside risk. We find that the coefficient for *MATERIAL* is positive and significantly associated with both *TAIL RISK* and *MES* for both the crisis and the non-crisis years. This supports the results in the prior section that BHCs led by materialistic CEOs are associated with higher downside tail risk and systemic risk. However, we find that the coefficient is significantly higher for the crisis years vs. the non-crisis years for both *TAIL RISK* and *MES* (at the .05 level or better). Having a materialistic CEO increased the marginal expected shortfall by 60 basis points during the crisis years (vs. 20 basis points in the non-crisis years) and increased tail risk by 80 basis points during the crisis years (vs. 20 basis points in the non-crisis period). In fact, cumulating these numbers over the 5% worst returns days for the stock and for S&P500, materialistic CEOs were associated with increased marginal expected shortfall and tail risk of 780 and 1,040 basis points respectively. Thus, the consequences of having materialistic CEO in terms of downside risk for firms are likely to be far more severe during economic downturns. The results for the control variables are similar to those obtained in earlier regressions.

## 5. CEO Type and Corporate Culture: Evidence from Insider Trading Activities

In this section we examine the effect of CEO type on corporate culture, and how that is manifested in the behaviors of other executives and employees in the organization. We use insider trading activities of other senior executives as a representation of how corporate culture

can infiltrate an organization and manifest itself through the actions of the organizations' employees.

Davidson et al. (2013) document that materialistic CEOs are associated with a corporate culture that reflects loose control systems, including weakened board monitoring, increased equity-based incentives for executives, and a heightened risk of fraud. Based on this evidence, we test and expect that banks led by materialistic (vs. frugal) CEOs are likely to reflect a culture where there are lower controls and less monitoring of the actions of other senior executives, thus allowing them to engage in insider trading based on private information. We follow the setting used in Jagolinzer et al. (2014) and examine the relation between insider trading activities of senior executives in banks and future abnormal returns before, during and after the financial crisis.<sup>15</sup> Jagolinzer et al. (2014) document that while insider trades do not predict future performance in the period leading up to the crisis or during the crisis (indicating that insiders were unable to predict the effect of the crisis on their firms), insider trades were predictive of future performance in the nine month period following the creation of TARP. Therefore, insiders anticipated the economic impact of the government bailout for their firms and traded on that private information. Based on this result, and given the corporate culture that is likely to ensue in firms led by materialistic CEOs, we hypothesize and test whether the insider trades of senior executives in firms led by materialistic CEOs were more predictive of future abnormal returns in the period of government bailout, as compared to the trades of executives in banks led by frugal CEOs. We test the following model:

$$\begin{aligned}
 ABNORMAL\ RETURNS_{i,t} &= \beta_0 + \beta_1 INSIDER\ TRADING_{i,t-1} \\
 &+ \beta_2 PRE-CRISIS + \beta_3 CRISIS + \beta_4 BAILOUT \\
 &+ \beta_5 INSIDER\ TRADING_{i,t-1} * PRE-CRISIS \\
 &+ \beta_6 INSIDER\ TRADING_{i,t-1} * CRISIS \\
 &+ \beta_7 INSIDER\ TRADING_{i,t-1} * BAILOUT + \beta_8 CONTROLS + \varepsilon_{i,t} \quad (6)
 \end{aligned}$$

In the above equation the dependent variable *ABNORMAL RETURNS* is the market adjusted return in month t. The independent variables include *INSIDER TRADING* which is the

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<sup>15</sup> Consistent with Jagolinzer et al. (2014) we use all firms in the financial services industry (SIC 6000-6999) for this analysis and we include dummy variables for the various types of financial institutions.

ratio of net insider purchases to the sum of total insider purchases and sales; *PRE-CRISIS* is a dummy variable that equals 1 for the pre-crisis years, July 2006 through June 2007; *CRISIS* is a dummy variable that equals 1 for the crisis years, July 2007 through June 2009; and *BAILOUT* is a dummy variable that equals 1 for the bailout years, October 2008 through June 2009. As in Jagolinzer et al., we include firm size (log of total assets), market capitalization to book value of shareholder's equity, the abnormal returns in the past year and month as control variables. We run the above regression separately for banks run by frugal and materialistic CEOs, and expect the interaction between *INSIDER TRADING\*BAILOUT* to be significantly more positively associated with abnormal returns for banks run by materialistic CEOs (vs. those for frugal CEOs).

Table 8 presents the results. As predicted, we find the interaction of *INSIDER TRADING\*BAILOUT* is positive and significant for banks run by materialistic CEOs; the association is insignificant for banks run by frugal CEOs. The difference between these coefficients is statistically significant (at the .04 level) and the magnitude of the coefficient for the materialistic CEOs is more than double than that corresponding to the frugal CEOs. This supports the conjecture that materialistic CEOs are associated with a corporate culture where other executives are more likely to engage in insider trading based on private information.

We do not find evidence that the trades of executives in banks led by materialistic CEOs are related to future returns during the crisis period; however, the trades of executives in banks run by frugal CEOs during this period are marginally negatively associated with future abnormal turns. The difference in the magnitudes between these coefficients is however, small and not significant. In the pre-crisis period, we find negative and statistically significant coefficients for the interaction *INSIDER TRADING\*PRE-CRISIS* for both the banks led by frugal and materialistic CEOs. However, the difference in these coefficients is not significant.

In sum, these results confirm that insiders could anticipate the effect of the government bailout for their firms, but only the executives in banks led by materialistic CEOs traded on this information. While our results on insider trading activities of senior executives provide one instance of how culture can influence the actions of the employees in a bank, it provides compelling food for thought on how materialistic CEOs can create a corporate culture that can heighten the risk that other executives in the bank will act in ways that are not likely to be in the best interests of shareholders and the economy.

## 6. Conclusions and Future Research

We investigate the extent to which bank CEO materialism (as evident by the CEO's ownership of luxury assets) is associated with the risk cultures of banking organizations. Specifically, we examine how materialistic (versus non-materialistic or frugal) CEOs influence the strength and independence of banks' risk management function, the downside tail risk and the behavior of non-CEO executives in the organization. We begin our analysis by conducting exploratory analyses examining whether bank deregulation in the 1990s coincided with a secular trend in the prevalence of materialistic bank CEOs running U.S. banks. We document that the proportion of banks run by materialistic CEOs increased significantly around adoption of the Gramm–Leach–Bliley Act in 1999, both in absolute terms and relative to non-financial firms. This trend is not a wealth effect as it cannot be explained by trends in total CEO compensation or by differences in wealth levels between materialistic and non-materialistic CEOs. Further, we do not observe significant trends in other CEO characteristics shown in the literature to influence corporate policy (namely, overconfidence, narcissism, military background, career start during a recession, and a record of legal infractions).

Next, we find that the strength and independence of banks' risk-management functions, as proxied by the risk management index (RMI) created by Ellul and Yeramilli (2012), is significantly lower for banks with materialistic CEOs, both cross-sectionally and within banks over time. We also find that RMI significantly increases after a frugal CEO replaces a materialistic CEO and decreases after a materialistic CEO succeeds a frugal one. We note also that there is no evidence of trends in RMI prior to switches in CEO types.

Our analyses on the relations between CEO materialism and two measures of downside tail risk reveals that banks with materialistic CEOs have significantly more downside tail risk and marginal expected shortfall relative to banks with frugal CEOs. In other words, the stand alone tail risk of a bank, as estimated as the average return over the 5% worst return days for the bank's stock in a given year, as well as the systemic risk, as estimated the extent to which an individual bank's stock returns are low when overall market returns are low, are both higher for banks run by materialistic CEOs. Further, the difference in risk between groups increased significantly during the recent financial crisis, where banks with materialistic CEOs had increased marginal expected shortfall by 60 basis points during the crisis years (vs. 20 basis

points in the non-crisis years) and increased individual tail risk by 80 basis points during the crisis years (vs. 20 basis points in the non-crisis period).

In our final set of analyses, we find that bank CEOs drive the corporate culture in banks, where the orientation of materialistic CEOs towards a single-minded pursuit of profits is manifested in the behavior and attitudes of other non-CEO senior executives in the organizations. Specifically, we document that non-CEO executives in banks with materialistic CEOs have a higher propensity to exploit inside trading opportunities around government intervention during the financial crisis relative to executives at banks with frugal CEOs.

Our analyses is limited by our inability to make causal inferences on the effect of CEO materialism on bank risk culture. Our results are consistent with either materialistic CEOs causing a change in the risk management functions in banks or with boards selecting materialistic CEOs as best suited to run banks post-deregulation. However, our combined set of results indicates that CEO materialism seems to be a key ingredient in shaping the strength and independence of banks' risk management functions.

Subject to the above caveat, our paper makes several contributions. First, we document a secular increase in the prevalence of materialistic bank CEOs coinciding with deregulation in the financial sector. This raises the possibility that deregulation contributed to the financial crisis through a culture channel by increasing the concentration of materialistic CEOs in this sector. Second, we add to the growing literature on culture in banking by documenting that materialistic CEOs are associated with increasing the preponderance of aggressive risk cultures in the banking industry. Finally, we provide evidence on the influence of CEOs through a "tone at the top" on the attitudes and behaviors of other senior executives in the organization.

Our study lays the groundwork for additional future research. For instance, are there settings when having a materialistic CEO can add value to shareholders? In preliminary analyses we find that materialistic CEOs are also associated with greater tail rewards and marginal expected surplus. This raises fascinating questions of when it is optimal to have a materialistic CEO as a leader in a bank, and what form of incentive compensation packages and corporate governance structures can one adopt to maximize economic efficiency in such cases.

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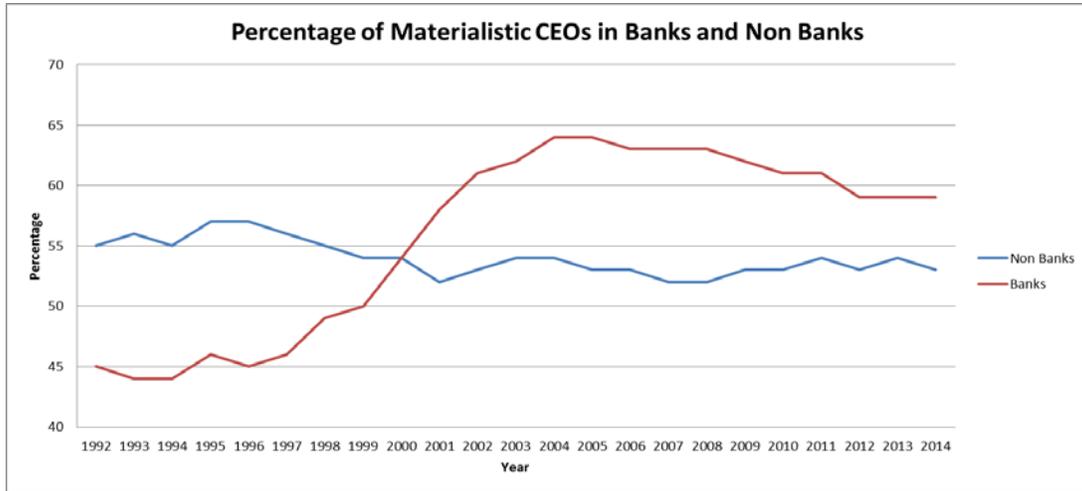
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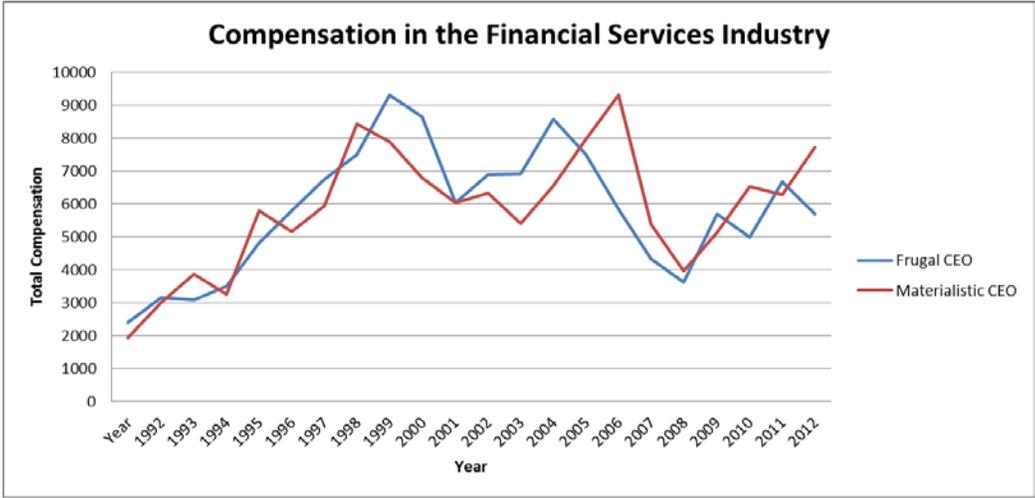
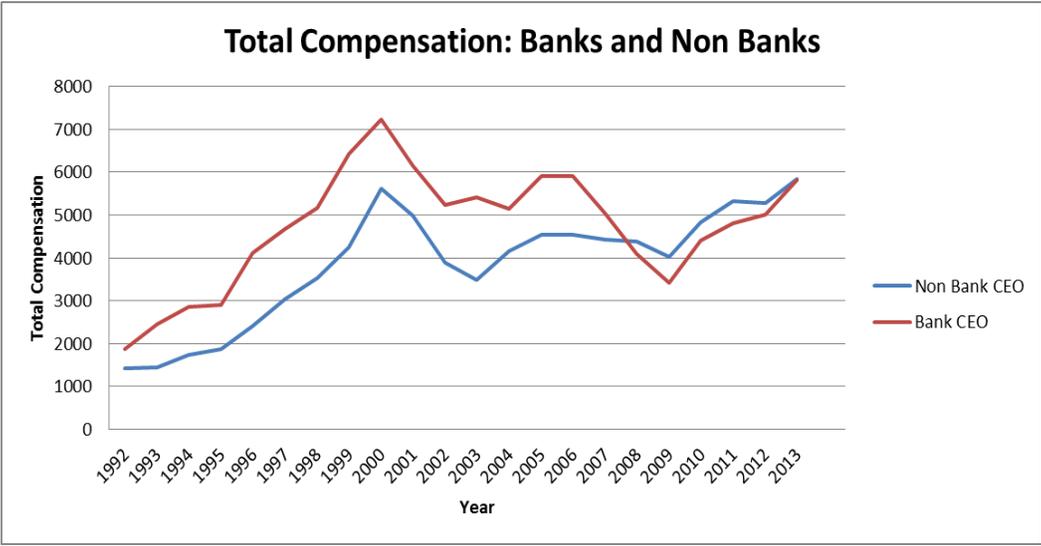
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**Figure 1**  
**Trends in CEO Type in Banks vs. Non-banks**



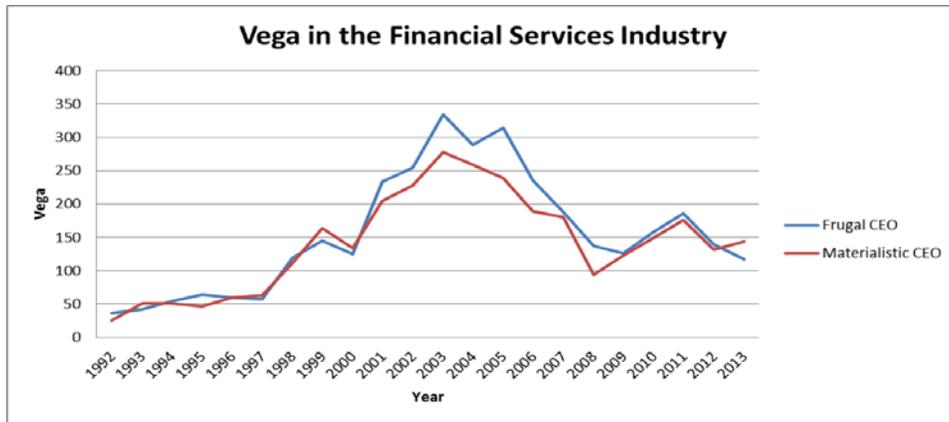
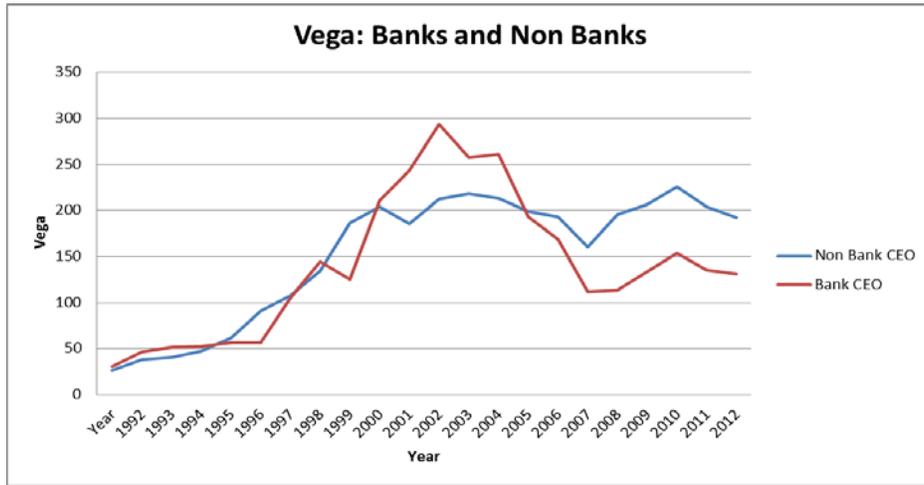
**Legend Figure 1:** This figure shows the trend in the composition of CEO type (Material vs. Frugal CEOs) in banks versus non-banks. A CEO is defined as *MATERIAL* if the CEO owns luxury assets, where luxury assets include boats >25 feet, cars worth more than \$75,000, a primary residence worth more than twice the average of median home prices in zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area. If a CEO does not own any of these luxury assets, he is defined as being *FRUGAL*.

**Figure 2**  
**CEO Type and Total Compensation**



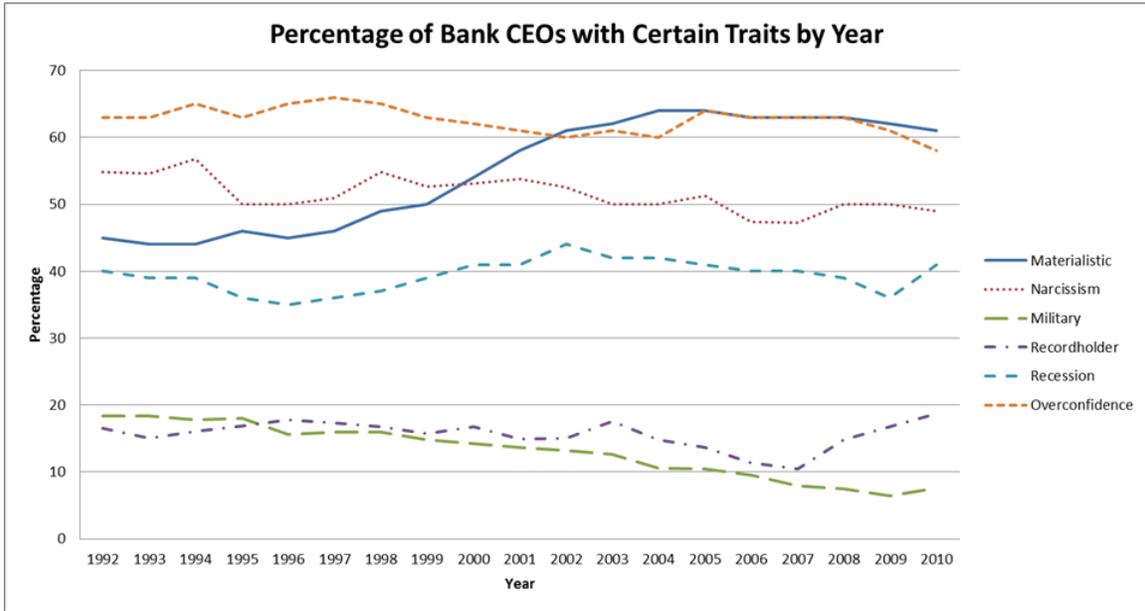
**Legend Figure 2:** This figure shows the trend in the total compensation of bank and non-bank CEOs as well as how this trend varies by CEO type (Material vs. Frugal CEOs) in banks. A CEO is defined as *MATERIAL* if the CEO owns luxury assets, where luxury assets include boats >25 feet, cars worth more than \$75,000, a primary residence worth more than twice the average of median home prices in zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area. If a CEO does not own any of these luxury assets, he is defined as being *FRUGAL*.

**Figure 3**  
**CEO Type and Vega**



**Legend Figure 3:** This figure shows the trend in the vega in compensation contracts of bank and non-bank CEOs as well as how this trend varies by CEO type (Material vs. Frugal CEOs) in banks. A CEO is defined as *MATERIAL* if the CEO owns luxury assets, where luxury assets include boats >25 feet, cars worth more than \$75,000, a primary residence worth more than twice the average of median home prices in zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area. If a CEO does not own any of these luxury assets, he is defined as being *FRUGAL*.

**Figure 4**  
**Trends in Bank CEO Characteristics Over Time**



**Legend Figure 4:** This figure shows trends over time in the prevalence of bank CEOs with certain characteristics. We consider the following traits. A CEO is defined as *materialistic* if he owns luxury assets, where luxury assets include boats >25 feet, cars worth more than \$75,000, a primary residence worth more than twice the average of median home prices in zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area. We measure *narcissism* by the area covered by a CEO's signatures scaled by the number of letters in his name and compute the percentage of CEOs in a given year above the median narcissism score for all CEOs in our sample. *Military* is measured based on whether a CEO has military experience. A CEO is considered to be a *recordholder* if he has any legal infractions, where legal infractions include driving under the influence, other drug-related charges, domestic violence, reckless behavior, disturbing the peace, and traffic violations (including speeding tickets). The variable *recession* is measured based on whether a CEO enters the labor market during a recession. A CEO is considered *overconfident* if he is a net acquirer of shares. We modify the measure as net purchases after the 4th year of tenure over the next four years in order to obtain sufficient observations.

**Table 1**  
**Sample Composition and Summary of CEO Luxury Asset Ownership**

	<b>TOTAL NUMBER (N)</b>
<b>FIRMS</b>	
Banks over 1992-2013	284
<b>EXECUTIVES</b>	
Chief Executive Officers (CEOs)	445
<i>Executive Composition:</i>	
Frugal CEOs	187
Materialistic CEOs	258
<i>Luxury Asset Ownership:</i>	
Cars worth more than \$75,000	270
Boats longer than 25 feet	247
Homes worth more than twice the average of median home prices of neighboring zip codes	332

Table 1 presents the number of firms included in the sample. In addition the table presents the number of frugal and material CEOs and the composition of asset ownership for the sample CEOs.

**Table 2, Panel A**  
**Descriptive Statistics**

	ALL FIRMS			FIRMS RUN BY FRUGAL CEOs	FIRMS RUN BY MATERIAL CEOs
	MEAN	MEDIAN	STD.	MEAN	MEAN
	(1)	(2)	(3)	(4)	(5)
<i>RETURN</i>	0.146	0.116	0.380	0.154	0.138
<i>VOLATILITY</i>	0.085	0.069	0.060	0.085	0.086
<i>BETA</i>	1.000	0.963	0.610	1.021	1.004
<i>DELTA</i>	0.010	0.002	0.040	0.014	0.005***
<i>VEGA</i>	0.001	0.001	0.003	0.001	0.001*
<i>SIZE</i>	9.992	9.723	1.490	9.966	9.980
<i>TIER 1</i>	10.969	10.235	4.570	10.750	10.68
<i>BAD LOANS</i>	0.009	0.005	0.010	0.009	0.010
<i>NON INT. INCOME</i>	0.266	0.227	0.180	0.263	0.289**
<i>COMM. LOANS</i>	0.161	0.152	0.100	0.187	0.206***
<i>CONS. LOANS</i>	0.095	0.076	0.100	0.125	0.128
<i>MORTG. LOANS</i>	0.308	0.298	0.190	0.246	0.244
<i>DEPOSITS</i>	0.674	0.698	0.150	0.665	0.682**
<i>TRADING ASSETS</i>	0.017	0.001	0.050	0.018	0.018
<i>MBS</i>	0.026	0.000	0.070	0.243	0.290*
<i>RMI</i>	0.649	0.583	0.330	0.723	0.583***
<i>MES</i>	0.030	0.022	0.020	0.029	0.032**
<i>TAIL RISK</i>	0.049	0.040	0.030	0.047	0.051***
<i>MTB</i>	1.870	1.709	1.040	1.841	1.898
<i>MATURITY MISMATCH</i>	0.863	0.864	0.160	0.868	0.874
<i>INSIDER TRADING</i>	-0.310	-0.950	0.860	-0.366	-0.337

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\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level.

Table 2 Panel A presents the mean, median and standard deviations of key variables used in the analyses. We also compare the mean values of these variables across firms run by frugal and material CEOs. The significance of t-tests of differences in means for frugal and material CEO firms are presented next to the corresponding variables for the firms run by material CEOs. *RETURN* is the returns over the past 12 months for a bank; *VOLATILITY* is the standard deviation of the past 12 month returns for a bank; *BETA* is the systematic risk of a bank calculated using CAPM using the prior 36 months of returns; *DELTA* is the dollar change in a CEO's wealth for a 1% change in stock price; *VEGA* is the dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns; *SIZE* is the natural logarithm of the book value of the total assets of the company; *TIER 1* is the ratio of a bank's tier-1 capital to the book value of total assets; *BAD LOANS* is the ratio of the sum of loans past due 90 days or more and non-accrual loans to total assets; *NON INT INCOME* is the ratio of non-interest income to the the sum of interest income and non-interest income; *COMM LOANS* is the ratio of commercial and industrial loans to total assets; *CONS LOANS* is the ratio of consumer loans to total assets; *MORTG LOANS* is the ratio of mortgage loans to total assets; *DEPOSITS* is the ratio of total deposits to total assets; *TRADING ASSETS* is the ratio of total trading assets to total assets; *MBS* is the ratio of all mortgage backed securities to total assets; *RMI* is the risk management index for BHCs as computed by Ellul and Yeramilli (2012); *MES* is the marginal expected shortfall measured as the average return for a bank during the 5% worst return days for the banking industry in a year; *TAIL RISK* is the average return for a bank during the 5% worst return days for the bank in a year; *MTB* is the ratio of market capitalization to the book value of shareholders equity; *MATURITY MISMATCH* is the ratio of deposits and short term borrowings less cash to total liabilities; *INSIDER TRADING* is the ratio of net insider purchases to the sum of total insider purchases and sales.

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**Table 2, Panel B**  
**Executives' Wealth and Luxury Asset Ownership Data**

<i>EXECUTIVE WEALTH DECILES</i>	<i>PERCENTAGE OF MATERIAL CEOS (TOTAL N = 445 )</i>
1 (Highest)	55.81
2	58.30
3	61.02
4	60.57
5	64.44
6	61.83
7	63.34
8	59.25
9	56.86
10 (Lowest)	53.90
Mean	59.53
Top 50% of wealthiest CEOs	60.03
Bottom 50% of wealthiest CEOs	59.04

Table 2, Panel B presents the distribution of the sample material CEOs over their wealth deciles. We measure the wealth of a CEO as the summation of his/her historical cash compensation, the value of current option and restricted stock holdings, the value generated from historical option exercises, deferred compensation and the value of long-term incentive plans, and profits from open market transactions. Material CEOs are those who own boats >25 feet, cars worth more than \$75,000, primary residences worth more than twice the average of median home prices in the zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area.

**Table 2, Panel C**  
**Summary of CEO Turnovers**

<i>YEAR</i>	<i>CEOS</i>	<i>TURNOVER</i>
1992	101	12
1993	112	12
1994	120	15
1995	129	16
1996	136	12
1997	139	16
1998	137	27
1999	153	11
2000	152	22
2001	154	16
2002	149	16
2003	149	18
2004	153	19
2005	154	13
2006	150	16
2007	147	21
2008	140	19
2009	132	30
2010	137	19
2011	137	14
2012	139	21
2013	144	19

Table 2 Panel C presents the number of CEO turnovers across the sample period.

**Table 3**  
**Risk Management Index**

$$RMI_{i,t} = \beta_0 + \beta_1 MATERIAL_{i,t-1} + CONTROLS_{i,t-1} + YEAR\ FE + \varepsilon_{i,t}$$

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.794*** (17.21)	0.803 (31.00)	-0.014 (-0.01)	1.539* (1.75)	-1.029 (-1.45)	1.421** (3.20)
<i>MATERIAL</i>	-0.133*** (-2.80)	-0.036** (-2.18)	-0.146*** (-3.01)	-0.055** (-2.82)	-0.151*** (-3.85)	-0.059** (-3.02)
<i>RETURNS</i>	-0.057* (-1.87)	0.003 (0.31)	-0.040 (-0.57)	-0.023 (-0.77)	-0.012 (-0.29)	0.001 (0.04)
<i>VOLATILITY</i>	-1.892*** (-6.26)	-0.151 (-1.22)	-0.716 (-1.06)	-0.339 (-1.12)	-0.851** (-2.81)	-0.378** (-2.28)
<i>BETA</i>	0.093** (2.48)	0.009 (0.80)	0.030 (0.72)	0.007 (0.37)	-0.008 (-0.29)	0.016 (1.29)
<i>DELTA</i>	0.199 (0.94)	-0.058 (-0.60)	-0.243 (-0.61)	0.118 (0.36)	-0.674* (-1.82)	0.187 (0.87)
<i>VEGA</i>	14.430 (1.36)	1.087 (0.82)	14.133** (2.18)	-1.327 (-0.41)	13.895** (2.45)	-0.981 (-0.35)
<i>SIZE</i>			0.133 (0.69)	-0.087 (-0.57)	0.293** (2.46)	-0.137* (-1.67)
<i>SIZE_SQUARED</i>			-0.004 (-0.50)	0.004 (0.63)	-0.012** (-2.20)	0.007 (1.50)
<i>TIER 1</i>			-0.023** (-2.29)	-0.002 (-0.34)	-0.017* (-1.93)	-0.001 (-0.39)
<i>BAD LOANS</i>			5.783 (1.40)	-0.610 (-0.44)	-0.438 (-0.94)	-0.163 (-0.84)
<i>COMM LOANS</i>			-0.406 (-1.61)	-0.166 (-0.98)	-0.049 (-0.21)	-0.034 (-0.24)
<i>CONS LOANS</i>			0.055 (0.23)	0.010 (0.05)	0.512*** (2.89)	0.162 (0.81)
<i>MORTG LOANS</i>			0.044 (0.18)	0.122 (0.92)	0.191 (1.06)	0.168 (1.61)
<i>DEPOSITS</i>			0.475 (0.88)	-0.392 (-1.51)	-0.635* (-1.84)	-0.295 (-1.50)
<i>MATURITY MISMATCH</i>			-0.166 (-0.56)	0.193 (1.09)	0.621*** (2.69)	0.145 (1.06)
<i>MTB</i>			0.008 (0.34)	0.001 (0.05)	-0.011 (-0.64)	-0.005 (-0.61)
<i>NON-INT INCOME</i>					0.442*** (2.72)	-0.024 (-0.26)

**Table 3 (Contd.)**  
**Risk Management Index**

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>TRADING ASSETS</i>					0.711** (2.10)	0.228 (0.37)
<i>MBS</i>					-0.702 (-1.51)	-0.343** (-2.27)
NO. OF OBS	1,084	1,084	610	610	827	827
Adj. R-Squared	0.13	0.93	0.25	0.91	0.42	0.93
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.

Table 3 presents the results of the relation between CEO materialism and the risk management in banks (results both with and without firm fixed effects are presented). *RMI* is the risk management index for BHCs as computed by Ellul and Yeramilli (2012); *MATERIAL* is a dummy variable that equals 1 if the CEO owns luxury assets and 0 otherwise. Luxury assets include cars costing more than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and additional residences worth twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)); *RETURNS* is the returns over the past 12 months for a bank; *VOLATILITY* is the standard deviation of the past 12 month returns for a bank; *BETA* is the systematic risk of a bank calculated using CAPM using the prior 36 months of returns; *DELTA* is the dollar change in a CEO's wealth for a 1% change in stock price; *VEGA* is the dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns; *SIZE (SIZE\_SQUARED)* is the natural logarithm of the (square of the) book value of the total assets of the company; *TIER 1* is the ratio of a bank's tier-1 capital to the book value of total assets; *BAD LOANS* is the ratio of the sum of loans past due 90 days or more and non-accrual loans to total assets; *COMM LOANS* is the ratio of commercial and industrial loans to total assets; *CONS LOANS* is the ratio of consumer loans to total assets; *MORTG LOANS* is the ratio of mortgage loans to total assets; *DEPOSITS* is the ratio of total deposits to total assets; *MATURITY MISMATCH* is the ratio of deposits and short term borrowings less cash to total liabilities; *MTB* is the ratio of market capitalization to the book value of shareholders equity; *NON INT INCOME* is the ratio of non-interest income to the the sum of interest income and non-interest income; *TRADING ASSETS* is the ratio of total trading assets to total assets; *MBS* is the ratio of all mortgage backed securities to total assets.

**Table 4**  
**Predecessor Successor Analysis**

$$RM_{i,t} = \beta_0 + \beta_1 \text{NEW CEO MATERIAL}_i + \beta_2 \text{SUCCESSOR}_{i,t} + \beta_3 \text{CHANGE CEO TYPE}_i + \beta_4 \text{NEW CEO MATERIAL}_i * \text{SUCCESSOR}_{i,t} + \beta_5 \text{NEW CEO MATERIAL}_i * \text{CHANGE CEO TYPE}_i + \beta_6 \text{SUCCESSOR}_{i,t} * \text{CHANGE CEO TYPE}_i + \beta_7 \text{NEW CEO MATERIAL}_i * \text{SUCCESSOR}_{i,t} * \text{CHANGE CEO TYPE}_i + \text{CONTROLS}_{i,t-1} + \text{YEAR FE} + \varepsilon_{i,t}$$

	<b>WITHOUT CONTROLS</b>	<b>WITH CONTROLS</b>
	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.565*** (9.80)	-0.902 (-1.50)
<i>NEW CEO MATERIAL</i>	-0.041 (-1.42)	-0.033 (-1.25)
<i>SUCCESSOR</i>	0.036 (1.11)	0.041 (1.44)
<i>CHANGE CEO TYPE</i>	-0.049 (-0.56)	-0.027 (-0.87)
<i>NEW CEO MATERIAL × SUCCESSOR</i>	-0.021 (-0.27)	-0.019 (-0.49)
<i>NEW CEO MATERIAL × CHANGE CEO TYPE</i>	0.210 (1.79)	0.107 (1.62)
<i>SUCCESSOR × CHANGE CEO TYPE</i>	0.179** (2.32)	0.214** (2.43)
<i>NEW CEO MATERIAL × SUCCESSOR × CHANGE CEO TYPE</i>	-0.289*** (-2.71)	-0.326*** (-2.58)
<u><i>Analysis of Changes</i></u>		
Material CEO to Material CEO	0.015 (0.31)	0.022 (0.42)
Frugal CEO to Material CEO	-0.095* (-1.90)	-0.090* (-1.84)
Frugal CEO to Frugal CEO	0.036 (0.66)	0.041 (0.70)
Material CEO to Frugal CEO	0.215*** (3.51)	0.228*** (2.74)
<u><i>Test of Differences</i></u>		
	<i>P- value</i>	<i>P-value</i>
Material – Frugal > Material – Material	0.01	0.01
Material – Frugal > Frugal – Frugal	0.01	0.02
Material – Frugal > Frugal - Material	0.01	0.01
Frugal – Material > Material - Material	0.09	0.09
Frugal – Material > Frugal - Frugal	0.07	0.06
Frugal – Material > Material - Frugal	0.01	0.01
ADJUSTED R2	0.06	0.45
NO. OF OBSERVATIONS	845	631
YEAR FE	Yes	Yes

**Table 4 (Cont.)**

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**\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.**

Table 4 presents results of a model that examines the relation between RMI and changes in CEO type due to turnover. A CEO is classified as material if he owns luxury assets (and vice versa), where luxury assets include cars worth more than \$75,000, boats >25 feet, a primary residence worth more than twice the average of median home prices in zip codes within fifteen miles of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding metropolitan area. *NEW CEO MATERIAL* is a dummy variable that equals 1 if the new CEO hired is material, and 0 otherwise; *SUCCESSOR* is a dummy variable that equal 1 if the CSR score is measured during the successor CEO's tenure, and 0 otherwise; *CHANGE CEO TYPE* is a dummy variable that equals 1 if there was a change in CEO type from the predecessor to the successor, and 0 otherwise. The controls variables (not reported for brevity) include the variables used in the prior RMI analyses, namely (see Appendix for definitions): returns, volatility, beta, delta, vega, size, size squared, tier 1, bad loans, commercial loans, consumer loans, mortgage loans, deposits, maturity mismatch; market-to-book, non-interest income, trading assets, and mortgage backed securities. The table also presents an analysis of the significance of changes in RMI corresponding to changes in CEO types and a test of these differences.

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**Table 5**  
**Firm Tail Risk**

$$TAIL\ RISK_{i,t} = \beta_0 + \beta_1 MATERIAL_{i,t-1} + CONTROLS_{i,t-1} + YEAR\ FE + \varepsilon_{i,t}$$

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.023*** (13.57)	0.022*** (9.89)	-0.022 (-1.20)	0.107*** (4.19)
<i>MATERIAL</i>		0.002*** (2.59)	0.002** (2.50)	0.001*** (2.37)
<i>RETURNS</i>	-0.014*** (-7.64)	-0.013*** (-7.85)	-0.018*** (-7.80)	-0.016*** (-10.12)
<i>VOLATILITY</i>	0.271*** (11.75)	0.245*** (7.14)	0.288*** (9.86)	0.218*** (9.85)
<i>BETA</i>	0.006*** (6.07)	0.007*** (6.09)	-0.002 (-1.25)	0.003 (2.23)
<i>DELTA</i>	0.000 (0.01)	0.000 (-0.02)	0.037*** (3.64)	0.027*** (2.72)
<i>VEGA</i>	-0.115 (-1.08)	-0.059 (-0.55)	-0.566** (-2.15)	-0.538** (-2.37)
<i>RMI</i>	-0.002** (-2.37)		0.001 (0.84)	0.001 (0.16)
<i>SIZE</i>			0.004 (1.46)	-0.016*** (-3.55)
<i>SIZE_SQUARED</i>			-0.001 (-0.90)	0.001*** (3.63)
<i>TIER 1</i>			0.001*** (2.77)	0.001** (2.07)
<i>BAD LOANS</i>			0.431*** (2.84)	0.320*** (8.72)
<i>COMM LOANS</i>			-0.002 (-0.28)	0.001 (0.12)
<i>CONS LOANS</i>			-0.009 (-1.55)	-0.007 (-1.36)
<i>MORTG LOANS</i>			-0.013*** (-2.76)	-0.005 (-1.24)
<i>DEPOSITS</i>			0.014 (1.28)	0.015* (1.92)
<i>MATURITY MISMATCH</i>			-0.001 (-0.19)	-0.015*** (-2.60)
<i>MTB</i>			0.002** (2.49)	0.001 (1.46)
<i>NON-INT INCOME</i>				0.010** (2.25)

**Table 5 (Contd.)  
Firm Tail Risk**

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>TRADING ASSETS</i>				-0.016** (-2.31)
<i>MBS</i>				-0.004 (-0.14)
NO. OF OBS	1,084	1,537	610	827
Adj. R-Squared	0.86	0.87	0.91	0.93
Year FE	Yes	Yes	Yes	Yes

\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.

Table 5 presents the results of the relation between CEO materialism and the tail risk of the firm. *TAIL RISK* is the average return for a bank during the 5% worst return days for the bank in a year; *MATERIAL* is a dummy variable that equals 1 if the CEO owns luxury assets and 0 otherwise. Luxury assets include cars costing more than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and additional residences worth twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)); *RETURNS* is the returns over the past 12 months for a bank; *VOLATILITY* is the standard deviation of the past 12 month returns for a bank; *BETA* is the systematic risk of a bank calculated using CAPM using the prior 36 months of returns; *DELTA* is the dollar change in a CEO's wealth for a 1% change in stock price; *VEGA* is the dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns; *SIZE (SIZE\_SQUARED)* is the natural logarithm of the (square of the) book value of the total assets of the company; *TIER 1* is the ratio of a bank's tier-1 capital to the book value of total assets; *BAD LOANS* is the ratio of the sum of loans past due 90 days or more and non-accrual loans to total assets; *COMM LOANS* is the ratio of commercial and industrial loans to total assets; *CONS LOANS* is the ratio of consumer loans to total assets; *MORTG LOANS* is the ratio of mortgage loans to total assets; *DEPOSITS* is the ratio of total deposits to total assets; *MATURITY MISMATCH* is the ratio of deposits and short term borrowings less cash to total liabilities; *MTB* is the ratio of market capitalization to the book value of shareholders equity; *NON-INT INCOME* is the ratio of non-interest income to the the sum of interest income and non-interest income; *TRADING ASSETS* is the ratio of total trading assets to total assets; *MBS* is the ratio of all mortgage backed securities to total assets.

**Table 6**  
**Marginal Expected Shortfall**

$$MES_{i,t} = \beta_0 + \beta_1 MATERIAL_{i,t-1} + CONTROLS_{i,t-1} + YEAR\ FE + \varepsilon_{i,t}$$

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.019*** (11.37)	0.020*** (18.23)	-0.111*** (-4.43)	-0.040 (-1.56)
<i>MATERIAL</i>		0.002*** (2.95)	0.003*** (2.60)	0.002** (2.49)
<i>RETURNS</i>	-0.006*** (-2.84)	-0.003** (-2.16)	-0.011*** (-3.47)	-0.005 (-1.31)
<i>VOLATILITY</i>	0.091*** (4.73)	0.032** (2.60)	0.034 (1.37)	0.060*** (2.65)
<i>BETA</i>	0.006*** (5.77)	0.006*** (8.05)	0.002 (1.03)	0.003* (1.91)
<i>DELTA</i>	-0.003 (-0.14)	0.007 (0.42)	0.029*** (3.23)	0.040*** (3.87)
<i>VEGA</i>	0.752*** (3.06)	0.582*** (3.84)	0.162 (0.64)	0.268 (0.53)
<i>RMI</i>	-0.002** (-2.25)		-0.001 (-0.26)	-0.002 (-1.07)
<i>SIZE</i>			0.020*** (4.69)	0.008 (1.86)
<i>SIZE_SQUARED</i>			-0.001*** (-3.89)	-0.001 (-0.86)
<i>TIER 1</i>			0.001 (1.29)	0.001 (1.42)
<i>BAD LOANS</i>			0.645*** (3.04)	0.250*** (7.72)
<i>COMM LOANS</i>			0.002 (0.38)	0.001 (0.29)
<i>CONS LOANS</i>			-0.005 (-1.19)	-0.009* (-1.91)
<i>MORTG LOANS</i>			-0.014*** (-3.11)	-0.008* (-1.95)
<i>DEPOSITS</i>			0.015 (0.98)	0.027*** (2.91)
<i>MATURITY MISMATCH</i>			-0.005 (-0.60)	-0.021*** (-3.75)
<i>MTB</i>			0.001 (1.60)	0.002*** (3.01)
<i>NON-INT INCOME</i>				-0.016*** (-3.06)

**Table 6 (Contd.)**  
**Marginal Expected Shortfall**

	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>TRADING ASSETS</i>				-0.017* (-1.93)
<i>MBS</i>				-0.031 (-1.09)
NO. OF OBS	1,084	1,537	610	827
Adj. R-Squared	0.77	0.79	0.87	0.87
Year FE	Yes	Yes	Yes	Yes

\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.

Table 6 presents the results of the relation between CEO materialism and the marginal expected shortfall in banks. *MES* is the marginal expected shortfall measured as the average return for a bank during the 5% worst return days for the banking industry in a year; *MATERIAL* is a dummy variable that equals 1 if the CEO owns luxury assets and 0 otherwise. Luxury assets include cars costing more than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and additional residences worth twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)); *RETURNS* is the returns over the past 12 months for a bank; *VOLATILITY* is the standard deviation of the past 12 month returns for a bank; *BETA* is the systematic risk of a bank calculated using CAPM using the prior 36 months of returns; *DELTA* is the dollar change in a CEO's wealth for a 1% change in stock price; *VEGA* is the dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns; *SIZE (SIZE\_SQUARED)* is the natural logarithm of the (square of the) book value of the total assets of the company; *TIER 1* is the ratio of a bank's tier-1 capital to the book value of total assets; *BAD LOANS* is the ratio of the sum of loans past due 90 days or more and non-accrual loans to total assets; *COMM LOANS* is the ratio of commercial and industrial loans to total assets; *CONS LOANS* is the ratio of consumer loans to total assets; *MORTG LOANS* is the ratio of mortgage loans to total assets; *DEPOSITS* is the ratio of total deposits to total assets; *MATURITY MISMATCH* is the ratio of deposits and short term borrowings less cash to total liabilities; *MTB* is the ratio of market capitalization to the book value of shareholders equity; *NON-INT INCOME* is the ratio of non-interest income to the the sum of interest income and non-interest income; *TRADING ASSETS* is the ratio of total trading assets to total assets; *MBS* is the ratio of all mortgage backed securities to total assets.

**Table 7**  
**Marginal Expected Shortfall and Firm Tail Risk: Crisis Years**

$$MES_{i,t} / TAIL\ RISK_{i,t} = \beta_0 + \beta_1 MATERIAL_{i,t-1} + CONTROLS_{i,t-1} + YEAR\ FE + \varepsilon_{i,t}$$

	MES		TAIL RISK	
	NON CRISIS YEARS	CRISIS YEARS	NON CRISIS YEARS	CRISIS YEARS
	COEF. (T)	COEF. (T)	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.016*** (17.26)	0.040*** (14.30)	0.017*** (13.85)	0.063*** (11.91)
<i>MATERIAL</i>	0.002** (2.50)	0.006** (2.31)	0.002** (2.36)	0.008** (2.36)
<i>RETURNS</i>	-0.001 (-0.92)	-0.016*** (-3.49)	-0.008*** (-6.48)	-0.054*** (-6.48)
<i>VOLATILITY</i>	0.034** (2.53)	0.068*** (2.92)	0.277*** (16.62)	0.128** (2.52)
<i>BETA</i>	0.007*** (9.27)	-0.003 (-0.71)	0.004*** (6.59)	0.022*** (4.54)
<i>DELTA</i>	0.011 (0.78)	-0.071*** (-3.77)	0.008 (0.78)	-0.114*** (-5.89)
<i>VEGA</i>	0.544*** (3.21)	1.824*** (4.30)	-0.166 (-1.44)	1.035** (2.20)
NO. OF OBS	1,364	173	1,364	173
Adj. R-Squared	0.78	0.67	0.81	0.75
Year FE	Yes	Yes	Yes	Yes
<i>Test of Differences</i>	<i>P-Value</i>		<i>P-Value</i>	
Crisis Years – Non-crisis years	0.05		0.04	

\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.

Table 7 presents the results of the relation between CEO materialism and the tail risk of the firm. *MES* is the marginal expected shortfall measured as the average return for a bank during the 5% worst return days for the banking industry in a year; *TAIL RISK* is the average return for a bank during the 5% worst return days for the bank in a year; *MATERIAL* is a dummy variable that equals 1 if the CEO owns luxury assets and 0 otherwise. Luxury assets include cars costing more than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and additional residences worth twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)); *RETURNS* is the returns over the past 12 months for a bank; *VOLATILITY* is the standard deviation of the past 12 month returns for a bank; *BETA* is the systematic risk of a bank calculated using CAPM using the prior 36 months of returns; *DELTA* is the dollar change in a CEO's wealth for a 1% change in stock price; *VEGA* is the dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns.

**Table 8**  
**CEO Materialism and Insider Trading**

$$ABNORMAL\ RETURNS_{i,t} = \beta_0 + \beta_1 INSIDER\ TRADING_{i,t-1} + CRISIS\ YEAR\ DUMMIES + INTERACTIONS + CONTROLS_{i,t-1} + \varepsilon_{i,t}$$

	FRUGAL CEO	MATERIAL CEO
	COEF. (T)	COEF. (T)
<i>INTERCEPT</i>	0.008 (1.18)	0.003 (0.36)
<i>INSIDER TRADING</i>	0.003** (2.09)	0.004*** (2.69)
<i>PRE-CRISIS</i>	-0.025*** (-8.84)	-0.021*** (-6.70)
<i>CRISIS</i>	-0.005 (-0.93)	0.006 (0.80)
<i>BAILOUT</i>	-0.046*** (-3.94)	-0.032*** (-3.16)
<i>INSIDER TRADING * PRE-CRISIS</i>	-0.009*** (-3.05)	-0.007*** (-2.58)
<i>INSIDER TRADING * CRISIS</i>	-0.008* (-1.82)	-0.005 (-0.90)
<i>INSIDER TRADING * BAILOUT</i>	0.012 (1.40)	0.028*** (2.91)
<i>SIZE</i>	-0.001 (-1.63)	-0.003** (-2.28)
<i>MTB</i>	-0.001 (-0.27)	0.001 (0.50)
<i>PAST MONTH RETURNS</i>	0.001 (0.39)	0.001 (1.38)
<i>PAST YEAR RETURNS</i>	0.001 (1.35)	0.001 (1.19)
NO. OF OBS	3,104	3,648
Adj. R-Squared	0.02	0.02
Year FE	Yes	Yes
<i>Test of Differences</i>		<i>P-Value</i>
Materialistic – Frugal		0.04

\*\*\*Significant at the 1% level; \*\*5% level; \* 10% level. Standard errors are clustered by CEO.

Table 8 presents the results of the relation between materialism of the CEO and insider trading by other senior executives of the firm. *ABNORMAL RETURNS* equals  $\alpha$  for net purchases made by executives, where  $\alpha$  is obtained from estimating transaction-day specific regressions of daily returns on common factors over the 180-days following each transaction:  $(R_i - R_f) = \alpha + \beta_1 (R_{mkt} - R_f) + \beta_2 SMB + \beta_3 HML + \beta_4 UMD + e$ .  $R_i$  is the daily return to firm  $i$ 's equity,  $R_f$  is the daily risk-free interest rate,  $R_{mkt}$  is the CRSP value-weighted market return, and *SMB*, *HML*, and *UMD* are the size, book-to-market, and momentum factors; *INSIDER TRADING* is the ratio of net insider purchases to the sum of total insider purchases and sales; *PRE-CRISIS* is a dummy variable that equals 1 for the pre-crisis years, July 2006 through June 2007; *CRISIS* is a dummy variable that equals 1 for the crisis years, July 2007 through June 2009; *BAILOUT* is a dummy variable that equals 1 for the bailout years, October 2008 through June 2009; *SIZE* is the natural logarithm of the book value of the total assets of the company; *MTB* is the ratio of market capitalization to the book value of shareholders equity; *PAST MONTH (YEAR) RETURNS* is the abnormal returns in month  $t-1$  (for the period  $t-2$  through  $t-12$ ) organized into quintiles.

## Appendix

### Definition of Variables and Data Sources

Variable	Measurement	Data Source
Risk Management Index. ( <i>RMI</i> )	The risk management index for BHCs as computed by Ellul and Yeramilli (2012). It is computed as the first principal component of five risk management variables, namely, CRO Executive, CRO-Top5, CRO Centrality, Risk Committee Experience, and Active Risk Committee.	Ellul and Yeramilli (2012)
Marginal Expected Shortfall / Surplus. ( <i>MES; MESR</i> )	The average return for a bank during the 5% worst (best) return days for the banking industry in a year.	CRSP
Tail Risk/ Reward. ( <i>TAIL RISK; TAIL REWARD</i> )	The average return for a bank during the 5% worst (best) return days for the bank in a year.	CRSP
Returns. ( <i>RETURNS</i> )	The returns over the past 12 months for a bank.	CRSP
Past returns. ( <i>PAST MONTH RETURNS; PAST YEAR RETURNS</i> )	The abnormal returns in month t-1 organized into quintiles; the abnormal returns for the period t-2 through t-12 organized into quintiles.	CRSP
Volatility. ( <i>VOLATILITY</i> )	The standard deviation of the past 12 month returns for a bank.	CRSP
Beta. ( <i>BETA</i> )	The systematic risk of a bank calculated using CAPM using the prior 36 months of returns.	CRSP
The delta for a CEO. ( <i>DELTA</i> )	The dollar change in a CEO's wealth for a 1% change in stock price.	ExecuComp
The vega for a CEO. ( <i>VEGA</i> )	The dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns.	ExecuComp
Firm size. ( <i>SIZE; SIZE_SQUARE</i> )	The natural logarithm of the book value of the total assets of the company; the natural logarithm of the square of the book value of the total assets of the company.	Compustat/ Call Reports
Tier-1 capital of a bank. ( <i>TIER-1</i> )	The ratio of a bank's tier-1 capital to the book value of total assets.	Compustat/ Call Reports
Bad loans. ( <i>BAD LOANS</i> )	The ratio of the sum of loans past due 90 days or more and non-accrual loans to total assets.	Compustat/ Call Reports
Commercial loans. ( <i>COMM LOANS</i> )	The ratio of commercial and industrial loans to total assets.	Compustat/ Call Reports
Consumer loans. ( <i>CONS LOANS</i> )	The ratio of consumer loans to total assets.	Compustat/ Call Reports
Mortgage loans. ( <i>MORTG LOANS</i> )	The ratio of mortgage loans to total assets.	Compustat/ Call Reports
Deposits. ( <i>DEPOSITS</i> )	The ratio of total deposits to total assets.	Compustat/ Call Reports
Maturity mismatch. ( <i>MATURITY MISMATCH</i> )	The ratio of deposits and short term borrowings less cash to total liabilities.	Compustat/ Call Reports
Market to book. ( <i>MTB</i> )	The ratio of market capitalization to the book value of shareholders equity.	Compustat/ CRSP
Non-interest income. ( <i>NON-INT INCOME</i> )	The ratio of non-interest income to the sum of interest income and non-interest income.	Compustat/ Call Reports
Trading assets. ( <i>TRADING ASSETS</i> )	The ratio of total trading assets to total assets.	Compustat/ Call Reports
Mortgage backed securities. ( <i>MBS</i> )	The ratio of all mortgage backed securities to total assets.	Compustat/ Call Reports

**Appendix (Contd.)**  
**Definition of Variables and Data Sources**

<b>Variable</b>	<b>Measurement</b>	<b>Data Source</b>
Net insider trades. ( <i>INSIDER TRADING</i> )	The ratio of net insider purchases to the sum of total insider purchases and sales.	Thomson Reuters
Pre-crisis period. ( <i>PRE-CRISIS</i> )	A dummy variable that equals 1 for the pre-crisis years, July 2006 through June 2007.	
Crisis period. ( <i>CRISIS</i> )	A dummy variable that equals 1 for the crisis years, July 2007 through June 2009.	
Bailout period. ( <i>BAILOUT</i> )	A dummy variable that equals 1 for the bailout years, October 2008 through June 2009.	
CEO wealth. ( <i>WEALTH</i> )	The natural logarithm of the fair value of the CEO's firm-based wealth measured as the sum of exercisable and unexercisable options, other compensation, pension value, unvested stock, all other shares held, and the salary and bonus received by the CEO over the previous 3 years.	ExecuComp
Luxury asset ownership. ( <i>MATERIAL</i> )	A dummy variable that equals 1 if the CEO owns luxury assets and 0 otherwise. Luxury assets include cars costing more than \$75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in zip codes within fifteen miles of the corporate headquarters, and additional residences worth twice the average home prices in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)).	Find Out the Truth.com (FOTT)
Change in CEO type to materialistic. ( <i>NEW_CEO_MATERIAL</i> )	A dummy variable that equals 1 if the new CEO hired after the turnover of the predecessor CEO is material, and 0 otherwise.	Find Out The Truth.com (FOTT)
Observation under the regime of the successor CEO. ( <i>SUCCESSOR</i> )	A dummy variable that equals 1 if an observation is during the time period when the new CEO was in office, and 0 otherwise.	Find Out The Truth.com (FOTT)
Change in CEO type. ( <i>CHANGE_CEO TYPE</i> )	A dummy variable that equals 1 if there was a change in type from the predecessor CEO to the new CEO, and 0 otherwise	Find Out The Truth.com (FOTT)