Bank CEO Materialism, Corporate Culture and Risk

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Abstract

We examine the extent to which bank CEOs exert influence on the corporate cultures of banking organizations by investigating how the prevalence of materialistic bank CEOs has evolved over time, and how observed risk management policies, the behavior of non-CEO executives and bank tail risk vary with bank CEO materialism. We document that the proportion of banks run by materialistic CEOs increased significantly from 1994 to 2004, coinciding 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. We also 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. Finally, we find that banks with materialistic CEOs have significantly more downside tail risk relative to banks with frugal CEOs; the difference between groups increased significantly during the recent crisis.

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 financial deregulation, bank executives' compensation, and corporate governance at banking institutions.[1] Another possibility is 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). While there is no singular definition of corporate culture, it is often conceptualized as a "system of shared values that define what is important, and norms that define appropriate attitudes and behaviors for organizational members" (O'Reilly and Chatman, 1996). The term *risk culture* refers specifically to the way the values and norms present throughout an organization shape risk-taking behavior (e.g., Power et al., 2013). An important research objective that has received limited attention by empiricists is to more deeply understand the determinants and dynamic evolution of bank 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 corporate cultures of banking organizations as reflected in the structure of banks' risk management functions and behavior of non-CEO executives. Further, we examine relations between a CEO's influence on culture and the bank's downside tail risk. We focus on CEOs based on the premise that a CEO's values and attitudes permeate the organization and represent critical inputs into shaping a financial institution's culture (e.g., Dudley, 2014; Group of Thirty, 2015; Lo, 2015).

Our research design first constructs a proxy for a CEO's values and attitudes with an empirical measure of CEO materialism. We then investigate how the prevalence of materialistic bank CEOs has evolved over time, and how observed risk management policies, the behavior of non-CEO executives and tail risk 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 a configuration of distinct values, attitudes or traits underpinning a way of life in which an individual displays a strong

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[1] For example, see Stiglitz (2010) on financial deregulation; Bhagat and Bolton (2014), Fahlenbrach and Stulz (2010), Bebchuk et al. (2010) on bank executives' compensation; and Beltratti and Stulz (2012) and Mehran et al. (2011) on corporate governance at banks.

attachment to worldly possessions and material needs and desires. It is the 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 a combination of the two could fundamentally alter the overall mix of CEO types running firms. With respect to banks, 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). We are unaware of theories linking CEO materialism to more intense competitive and growth environments, and so we view this as an exploratory analysis 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.[2] Across all industries in the U.S., the banking industry had the *lowest* proportion of materialistic CEOs in 1994 at 47% (comparable to Utilities). However, by 2004 the banking sector transformed to having the *highest* proportion of any industry at 67%. This trend does not appear to be driven by wealth effects 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

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[2] 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.

bank CEOs did not increase relative to those of non-materialistic CEOs.[3] Further, we do not observe significant trends in other CEO characteristics shown in the literature to influence corporate policy including overconfidence (Malmendier 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, 2016) or a record of legal infractions (Davidson et al., 2015).

Having established a significant increase in the prevalence of materialistic bank CEOs in the period preceding the financial crisis, we next examine whether CEO materialism is related to bank culture. To explore this issue, we first focus on key policy choices with respect to the structure of a bank's risk management function. Our premise is that the organizational design of a bank's risk management functions is a reflection of top management's values and risk priorities, and these choices can transmit managements' values and priorities throughout the organization. These risk management analyses 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.

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 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

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[3] 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 volatility.

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.[4] In either case, CEO materialism seems to be a key ingredient in shaping the strength and independence of banks' risk management functions.

To the extent that CEO materialism is an important element in shaping culture, we would expect this orientation to manifest in the behavior and attitudes of non-CEO executives. Consistent with materialism operating through a culture channel, Davidson et al. (2015) 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. (2015) 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 this spirit, we examine whether non-CEO bank executives more aggressively exploit insider trading opportunities in banks run by materialistic CEOs. 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.

While we have established that the prevalence of CEO materialism increased prior to the crisis and that materialism is associated with weaker risk management functions and other aspects of corporate culture, we turn next to an investigation of the impact of CEO materialism on bank risk. A key role of risk management is to mitigate the risk of large losses, motivating a focus on downside tail risk. We 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 based on the expected shortfall measure that is widely used within financial firms to capture

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[4] See Schoar and Zuo (2016) for a related argument.

expected loss conditional on returns being less than some quantile cutoff (see Acharya et al., 2010). Our second measure, Marginal Expected Shortfall (*MES*), is 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.[5] 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.

The increased risk of large losses raises the question of why banks would hire these types of CEOs, unless there is some upside potential from having them as leaders. To investigate this, we examine whether CEO materialism is associated with *upside tail reward*. We find that while materialistic CEOs are associated with higher downside tail risk and systemic risk, they are also associated with higher tail reward and marginal expected surplus. While this provides one rationale for hiring materialistic individuals to lead a firm, their desirability as bank CEOs from an economy-wide perspective is a topic that needs more in depth research and deliberations.

Our paper makes several contributions. While a significant literature explores relations between CEO characteristics and corporate policy[6], 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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[5] In our analysis, we take the negative of both tail risk measures so that higher values represent more tail risk.
[6] 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 total compensation adjusted for size and industry, 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 the persistence of a given bank's risk culture is at least partially 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 empirical analyses on relations between materialism and corporate culture, as evident in bank risk management functions and the insider trading activities of non-CEO senior executives. Section 5 presents our results on the association between materialistic CEOs and bank risk, and section 6 concludes.

6

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 bank risk culture. 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 how a range of specific managerial characteristics 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, 2016), and a record of legal infractions (Davidson et al., 2015).[7] 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, we provide evidence that the prevalence of CEO materialism increased around bank deregulation where these other CEO characteristics did not. Also, evidence in Davidson et al. (2015) suggests that materialism is distinct from and largely independent of these other characteristics.

Discussions of materialism are found in philosophy, political economy, theology, economics, anthropology, sociology, psychology, and consumer research. Recent psychology literature conceptualizes materialism as values, attitudes or traits 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). Materialistic individuals place the acquisition of material goods at the center of their lives, and for such individuals a lifestyle with a high level of material consumption serves as a primary goal (Fournier and Richins, 1991, Richins and Dawson, 1992, Daun, 1983). 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

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[7] See also Graham et al. (2013), Cronqvist et al. (2012), and Kaplan et al. (2012), among others,

other means that distinguishes materialism (Richins and Rudmin, 1994). The literature also identifies frugality, likely indistinct from non-materialism, as the degree to which a consumer is both restrained in acquiring and resourceful in using goods and services to achieve long term goals (DeYoung, 1996, Lastovicka et al., 1999).

A key premise of our paper is that there are explicit connections between materialism and culture. There is evidence that the prevalence 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, and 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. (2015) argue that if CEO materialism influences a firm's culture, than we should observe systematically different behavior for non-CEO employees of firm's run by a materialistic CEO. They find that firms with materialistic CEOs have relatively weaker control environments than firms run by frugal CEOs. Specifically materialistic CEOs, although not more likely to perpetrate fraud themselves, lead firms in which non-CEO insiders have relatively high probabilities of perpetrating fraud. Also, the probability of erroneous financial reporting is higher in firms run by materialistic (vs. frugal) CEOs. Focusing on the banking industry, we investigate the extent to which that banks run by materialistic CEOs have weaker risk control environments as reflected in the strength and independence of banks' risk management functions.

We argue that a bank's choice of risk management functions reflect the risk culture and transmit values and attitudes of top management throughout an organization. This idea builds on Lo (2015) who argues that observed risk priorities exhibited by an organization mirror a corporate culture's values. Further, the Financial Stability Board (2014) contends that a strong risk culture should emphasize throughout the bank the importance ensuring that an effective system of risk management is put in place. 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.

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We measure risk management using the 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 will likely 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 to others that the bank values aggressive risk-taking with lower regard for tail risk.

Focusing further on how materialistic CEO impact the behavior of non-CEO employees, Davidson et al. (2015) 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.

There is evidence that materialistic people are less sensitive to behaviors that might negatively affect others. Kilbourne and Pickett (2008) document that materialism has a negative effect on environmental beliefs, and these beliefs affect environmental concern and environmentally responsible behaviors. Davidson et al. (2016) 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. Materialism has also been argued to be questionable from an ethical perspective, as more materialistic individuals are more likely to be willing to bend ethical rules to gain possessions (Richins and Rudmin [1992], Muncy and Eastman [1998]). With respect to bank culture, Cohn et al. (2014) provide experimental evidence suggesting that the prevailing business culture in the banking industry weakens and undermines the honesty norm. They show that when subjects' professional identity as bank employees is rendered salient, a significant

proportion of them become dishonest. Further, they provide evidence that bank employees with more materialistic values have a greater tendency to act dishonestly.[8] Extrapolating from this evidence, we hypothesize that relative to less materialistic CEOs, materialistic bank CEOs will more strongly emphasize materialistic values. As a result, banks run by materialistic CEOs will have cultures that subordinate concerns for the effects of a bank's decisions on the economy and other stakeholders.

We want to emphasize that it is not our intention to argue that CEO materialism is unambiguously bad. 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, a culture 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, the extent to which CEOs materialism shapes banks' culture, and the implications of materialism for bank risk.

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.[9] We follow a rigorous procedure to assure ourselves that we are adequately capturing luxury assets owned by an individual. In brief, we collect real estate data from title/ownership searches as well as by looking up property

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[8] Cohn et al. (2014) asked subjects about the extent to which they endorse the statement that social status is primarily determined by financial success. They argue that subjects who endorse this statement are more prone to seek status through financial success, implying that their responses provide an approximation of their materialism.
[9] Our acquisition and use of asset data conforms to all provisions of the Driver's Privacy Protection Act (DPPA).

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 (the steps we take to attest to the veracity of the real estate values are described in detail in Appendix B). 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 the Core Based Statistical Area (CBSA) of his firm's corporate headquarters, any additional residences worth more than twice the average home prices in that CBSA, and 0 otherwise.[10]

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

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[10] We include a CEO's luxury asset purchases regardless of when they occur to define *MATERIAL*. 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. We note that, in general, there is a question of whether materialism is a stable trait within person or whether it can vary over time (and whether this variance is symmetric). Broadly, this can be thought of as a "nature versus nurture" argument. We look into this by considering the subset of individuals whose classification as "materialistic" during their tenure at the firm changes. For example, an individual who was CEO from 2000-2009 and who acquired a lavish asset in 2004 would be classified as frugal through 2003 and materialistic beginning in 2004 if measured in real time. When estimating models using these individuals and including a person fixed effect we find no significant difference in results pre and post 'revelation' of materialism. It appears their behavior is the same before and after buying the asset. This doesn't imply that the individual was 'born that way' or that materialism must be a stable trait through life. But, it does appear that once an individual is of an age to become CEO of a large publicly traded company that our proxy of materialism is a stable trait from that point on in our setting and is more accurately measured with a static binary variable.

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 the CBSA 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 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 the CBSA of the corporate headquarters, and the value of any additional residences as of December 31, 2013.[11] We check the robustness of our results to several other measures to capture the materialism of an executive; we discuss these alternate measures in detail in Appendix B.

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 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 (2013) for details on the construction of RMI).

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[11] 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.

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 (*TAIL RISK*) and marginal expected shortfall (*MES*), as well as measures of annual returns and volatility of returns. The 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 is employed to compute various firm characteristics and CEO compensation data to compute executive wealth, the sensitivity of CEO compensation to stock prices (i.e., delta) and the sensitivity of CEO compensation to stock return volatility (i.e., 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.[12] 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 60% 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 Appendix A for detailed descriptions of these variables. To better understand the differences in 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,

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[12] We also exclude Interim CEOs who held the title of CEO for less than 1 fiscal year.

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. 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%). Interestingly, while the tail risk and marginal expected shortfall is significantly higher for firms led by materialistic CEOs, so are the tail reward and marginal expected surplus for these firms (vs. firms led by frugal CEOs). Specifically, a firm led by a materialistic CEO has on average 6.1% (3.5%) returns over the 5% best return days for the bank (S&P500); whereas a firm led by a frugal CEO has on average 5.7% (3.2%) returns over the 5% best return days for the bank (S&P500), and these differences are statistically significant.

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 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 are 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 suggest a significant association between CEO materialism and bank culture. 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 1999 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 47% (comparable to Utilities), and the highest proportion of 67% 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.

While Figure 1 portrays a dramatic shift in the composition of materialistic CEOs after the passage of the Gramm-Leach-Bliley Act in 1999, we further establish this trend statistically by testing the differences in the average percentages of materialistic CEOs in financial and non-financial service firms from the period before the passage of the Gramm-Leach-Bliley Act (1992-1999) to the period after the passage of this Act (2000-2014). Table 3 presents these differences. In the 1990-1999 time frame, 49% of CEOs were materialistic on average in financial services firms whereas 59% of CEOs were materialistic on average in non-financial services firms. This difference is statistically significant (at the .01 level). Both these sectors saw large shifts in these proportions in the 2000-2014 period. The average percentage of materialistic CEOs increased to 65% in the financial services firms (this increase is significant at the .01 level), while the average percentage of materialistic CEOs in non-financial firms declined marginally to 56% (significant at the .10 level). The difference in these percentages between the financial and non-financial firms continues to be significant (at the .01 level) in the 2000-2014 period, however, during this period the percentage of materialistic CEOs is higher in the financial services sector. These results confirm our graphical analyses above.

To verify that these trends are not concentrated in specific subsets of banking sector, we examine the differences in the average percentage of materialistic CEOs in three subsamples across the two periods: large financial services companies (firms bigger than the sample median), small financial services firms (firms smaller than the sample median), and the sample of bank holding companies only. We find that the average percentage of materialistic CEOs increased significantly (between 15-17%) in all three subsamples from the period before Gramm-Leach-

Bliley to the period after the passage of this Act (all differences are significant at the .01 level). Thus, the increase in materialistic CEOs occurred homogeneously across the financial sector.

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 is 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 the composition of bank CEOs. In fact, the trends in total compensation offered to CEOs in banks and non-banks move parallel to each other, peak in 2000 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 2001 and 2005 (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.

We then 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 (Malmendier 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, 2016) or whether he had a record of legal infractions (Davidson et al., 2015).[13] As is evident from Figure 4, we do not observe any significant trends in any of these CEO characteristics (not surprisingly, our results are robust to including controls for all the above types). Only CEO materialism trends with deregulation.

Finally, in Table 4, we use data from BoardEx to examine whether there was a simultaneous shift in CEOs with different professional backgrounds after deregulation (after 1999). We consider the prior professional backgrounds of CEOs whose tenures began during 1990-1999 (refer to them as pre-deregulation CEOs) and compare them to the backgrounds of CEOs whose tenures started during 2000-2009 (post-deregulation CEOs). We document that, on average, post-deregulation CEOs were significantly less likely to have prior commercial banking experience, significantly more likely to have investment banking experience, were significantly less likely to be inside hires, and were significantly more likely to have Chief Financial Officer experience (significant at the .05 level or better). We examine these differences in professional backgrounds across our sample of materialistic and frugal CEOs, and find that as compared to frugal CEOs, materialistic CEOs are less likely to have commercial banking experience, more likely to have investment banking experience and less likely to be inside hires (significant at the .10 level or better). Given that there were significant shifts in the professional experiences of the CEOs being hired in the post-deregulation period, we verify the robustness of all our regressions by including controls for the professional backgrounds as well as inside/outside hires (results available on request).

The above analyses document a significant trend in the CEO pool that entered the banking sector over our sample period, and presents compelling evidence of a secular shift in the composition of the type of CEOs in this industry post-deregulation. This evidence of a dramatic shift in CEO materialism in banks provides added ground for examining the hypothesis that CEO

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[13] We measure these traits based on the prior literature cited above. A CEO is considered overconfident is 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 scaled 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 a 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).

materialism is related to more aggressive risk-taking cultures. We examine this in a multivariate setting in the next section.

4. CEO Materialism and Corporate Culture

4.1. CEO Materialism and Bank Risk Management

We begin our formal analysis by examining whether the risk management function in BHCs (as proxied by RMI) varies with CEO type. We estimate the following model with year fixed effects:

$$RMI_{i,t} = \beta 0 + \beta 1\ MATERIAL_{i,t-1} + \beta 2\ CONTROLS_{i,t-1} + Year\ FE + \varepsilon_{i,t} \qquad (1)$$

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. We repeat the above analysis by including firm fixed effects in the model and present results both with and without firm effects. The main results are consistent across all models and we discuss the main observations below.

Table 5 presents the results. For all models, the coefficient on *MATERIAL* is negative and statistically significant (at the .05 level or better), providing evidence of a significant 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 (with firm fixed effects), we find that having a materialistic CEO lowers RMI by 0.142, 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 four) 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. 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 one model. This is intuitive and suggests that BHCs in which CEO wealth is more sensitive to volatility in returns have higher RMI.

4.1.1 Predecessor-Successor Analysis

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

$RMI_{i,t}$ = β0 + β1 *NEW CEO MATERIAL$_i$* + β2 *SUCCESSOR$_{i,t}$*

+ β3 *CHANGE CEO TYPE$_i$* + β4 *NEW CEO MATERIAL$_i$* * *SUCCESSOR$_{i,t}$*

+ β5 *NEW CEO MATERIAL$_i$* * *CHANGE CEO TYPE$_i$* + β6 *SUCCESSOR$_{i,t}$* * *CHANGE CEO TYPE$_i$* + β7 *NEW CEO MATERIAL$_i$* * *SUCCESSOR$_{i,t}$* * *CHANGE CEO TYPE$_i$*

+ β8 *CONTROLS + YEAR FE + $\varepsilon_{i,t}$* ,   (2)

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 after 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,

20

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 in decreased sample size, and therefore we report results both with and without these variables. The results are similar for both models.

Table 6 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 RMI increases significantly (at the .01 level) following the replacement of a materialistic CEO 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 decreases significantly (though only at the .10 level) when a frugal CEO is replaced by a materialistic CEO. The lower significance level is intuitive as it is plausibly 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

21

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.[14] Overall, our results in this section indicate that CEO materialism is an important factor in influencing banks' risk management functions.

4.2 CEO Materialism and Insider Trading Activities

We now examine the effect of CEO type on 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. (2015) document that materialistic CEOs are associated with a corporate culture that reflects lax control systems, including weakened board monitoring, increased equity-based incentives for executives, and a heightened risk of fraud. Based on this evidence, we examine the extent to which banks led by materialistic (vs. frugal) CEOs reflect a culture with 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.[15] 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 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:

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[14] This result is unreported for brevity, but available on request.
[15] 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.

$$ABNORMAL\ RETURNS_{i,t} = \beta 0 + \beta 1\ INSIDER\ TRADING_{i,t-1}$$

$$+\ \beta 2\ PRE\text{-}CRISIS\ +\ +\ \beta 3\ CRISIS + \beta 4\ BAILOUT$$

$$+\ \beta 5\ INSIDER\ TRADING_{i,t-1} * PRE\text{-}CRISIS$$

$$+\ \beta 6\ INSIDER\ TRADING_{i,t-1} * CRISIS$$

$$+\ \beta 7\ INSIDER\ TRADING_{i,t-1} * BAILOUT + \beta 8\ CONTROLS\ +\ \varepsilon_{i,t} \qquad (3)$$

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 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 7 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 .05 level) and the magnitude of the coefficient for the materialistic CEOs is more than double than that corresponding to the frugal CEOs. This is consistent with 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 are consistent with insiders anticipating the effect of the government bailout for their firms, where 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.

5. CEO Materialism and Bank Risk

5.1. CEO Materialism and Downside Risk

In our next set of analyses we examine the association between CEO materialism and the outcomes of banks' risk-management systems, as manifested in downside tail risk. We consider two measures: 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:

$$TAIL\ RISK_{i,t} = \beta0 + \beta1\ MATERIAL_i + \beta2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \qquad (4)$$
$$MES_{i,t} = \beta0 + \beta1\ MATERIAL_i + \beta2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \qquad (5)$$

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 equation (1).

Table 8 presents the results for *TAIL RISK* and Table 9 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 third column we include *MATERIAL* and *RMI* as well as the various control variables.

The results in the first column are consistent with those in Ellul and Yeramilli – we also find a negative and significant coefficient 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* for both measures of tail risk (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 model 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 provide evidence 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 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 do not find significant coefficients for *SIZE* nor *SIZE SQUARED*. 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):

$$TAIL\ RISK_{i,t} / MES_{i,t} = \beta 0 + \beta 1\ MATERIAL_i + \beta 2\ CONTROLS$$
$$+\ Year\ FE + \varepsilon_{i,t} \tag{6}$$

Table 10 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. 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. This suggests that 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.

5.2. CEO Materialism and Upside Potential

The previous section documented that having a materialistic CEO at the helm is associated with significantly higher downside risk for a firm, particularly during crisis periods. This raises the question – why do firms hire such managers? What else do they bring to the table that makes them good candidates to lead certain firms? In this section we make an attempt to understand the upside of having materialistic CEOs by examining whether such CEOs are also associated with more upside tail rewards.

We consider two measures of upside potential for a firm symmetric to the downside risk measures: 1) the stand alone tail reward of individual banks (*TAIL REWARD*); and 2) the marginal expected surplus, capturing the extent to which an individual bank's stock returns are high when market returns are high (*MESUR*). We estimate the following regressions:

$$TAIL\ REWARD_{i,t} = \beta 0 + \beta 1\ MATERIAL_i + \beta 2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \qquad (7)$$

$$MESUR_{i,t} = \beta 0 + \beta 1\ MATERIAL_i + \beta 2\ CONTROLS + Year\ FE + \varepsilon_{i,t} \qquad (8)$$

where the dependent variables are the two measures of upside reward, *MATERIAL* is a dummy variable that equals 1 if the CEO is materialistic, and the control variables are the same as in the models represented in equations (4) and (5).

Table 11 presents the results for *TAIL REWARD* and Table 12 present the results for *MESUR*. We present tests and results in the same order as we did in the prior section, using only *RMI*, only *MATERIAL* and both as right hand side variables. As before, the results for both are similar and we discuss them together (we also report results both with and without certain controls due to data constraints).

Two results stand out. First, across all models *RMI* is not significantly associated with either the tail reward or the marginal expected surplus. Second, across all models, *MATERIAL* is positive and significantly associated with the tail reward as well as the marginal expected surplus

for a bank (at the .05 level or better). These results indicate that stronger risk management controls can be associated with lower tail risk and lower marginal expected shortfall (as we find), but they are not related to a bank's upside returns. But, materialistic CEOs (through the decisions/ strategic choices they make) are significantly related to the upside returns earned by a bank (vs. frugal CEOs). Specifically, having a materialistic CEO (vs. a frugal CEO) increases *TAIL REWARD* as well as *MES* by approximately 20-30 basis points (which correspond to 260-390 basis points over 13 days corresponding to the 5% highest return days for the bank and the S&P500). The results for the controls variables for both models with *TAIL REWARD* and *MESUR* are similar to those in the case of *TAIL RISK* and *MES* respectively, and we do not repeat the discussion here.

In sum, it seems that while materialistic individuals expose a bank to higher downside risk, they also help the bank earn higher upside rewards. This gives an idea as to why such individuals can be attractive to shareholders, but whether they are "socially optimal" choices as bank CEOs is a question open to debate.

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 cultures of banking organizations. Specifically, we examine how the prevalence of materialistic bank CEOs has evolved over time, and how observed risk management policies, the behavior of non-CEO executives and tail risk vary with bank CEO materialism. We first conduct 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 following adoption of the Interstate Banking and Branching Efficiency Act and the Gramm-Leach-Bliley Act, 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 (2013), 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.

We provide evidence consistent with the existence of a culture channel through which CEO materialism shapes 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.

Finally, our analyses on the relations between CEO materialism and two measures of downside tail risk suggests 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). Interestingly, we also find that banks run by materialistic (vs. frugal) CEOs are associated with higher average returns over the 5% best return days for the bank's stock in a given year, as well as higher stock returns when overall market returns are high.

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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Table 1
Sample Composition and Summary of CEO Luxury Asset Ownership

	TOTAL NUMBER (N)
FIRMS	
Banks over 1992-2013	284
EXECUTIVES	
Chief Executive Officers (CEOs)	445
Executive Composition:	
Frugal CEOs	176
Materialistic CEOs	269
Luxury Asset Ownership:	
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 the Core Based Statistical Area	332

Table 1, panel A 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.

	ALL FIRMS			FIRMS RUN BY FRUGAL CEOs	FIRMS RUN BY MATERIAL CEOS
	MEAN (1)	MEDIAN (2)	STD. (3)	MEAN (4)	MEAN (5)
RETURN	0.146	0.116	0.380	0.154	0.138
VOLATILITY	0.085	0.069	0.060	0.085	0.086
BETA	1.000	0.963	0.610	1.021	1.004
DELTA	0.010	0.002	0.040	0.014	0.005***
VEGA	0.001	0.001	0.003	0.001	0.001*
SIZE	9.992	9.723	1.490	9.966	9.980
TIER 1	10.969	10.235	4.570	10.750	10.68
BAD LOANS	0.009	0.005	0.010	0.009	0.010
NON INT. INCOME	0.266	0.227	0.180	0.263	0.289**
COMM. LOANS	0.161	0.152	0.100	0.187	0.206***
CONS. LOANS	0.095	0.076	0.100	0.125	0.128
MORTG. LOANS	0.308	0.298	0.190	0.246	0.244
DEPOSITS	0.674	0.698	0.150	0.665	0.682**
TRADING ASSETS	0.017	0.001	0.050	0.018	0.018
MBS	0.026	0.000	0.070	0.243	0.290*
RMI	0.649	0.583	0.330	0.723	0.583***
MES	0.030	0.022	0.020	0.029	0.032**
TAIL RISK	0.049	0.040	0.030	0.047	0.051***
MESUR	0.033	0.024	0.031	0.032	0.035**
TAIL REWARD	0.059	0.045	0.043	0.057	0.061***
MTB	1.870	1.709	1.040	1.841	1.898
MATURITY MISMATCH	0.863	0.864	0.160	0.868	0.874
INSIDER TRADING	-0.310	-0.950	0.860	-0.366	-0.337

***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 materialistic 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 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 (2013); *MES (MESUR)* is the marginal expected shortfall (surplus) measured as the average return for a bank during the 5% worst (best) return days for the banking industry in a year; *TAIL RISK (REWARD)* is the average return for a bank during the 5% worst (best) 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

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

EXECUTIVE WEALTH DECILES	PERCENTAGE OF MATERIAL CEOS (TOTAL N = 269)
1 (Highest)	59.64
2	62.17
3	63.74
4	63.80
5	66.75
6	65.54
7	66.48
8	62.15
9	59.61
10 (Lowest)	56.32
Mean	62.62
Top 50% of wealthiest CEOs	63.22
Bottom 50% of wealthiest CEOs	62.02

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 Core Based Statistical Area (CBSA) of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding CBSA.

Table 2, Panel C
Summary of CEO Turnovers

YEAR	CEOS	TURNOVER
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 over the sample period.

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

Percentage of Materialistic CEOs in Banks and Non Banks
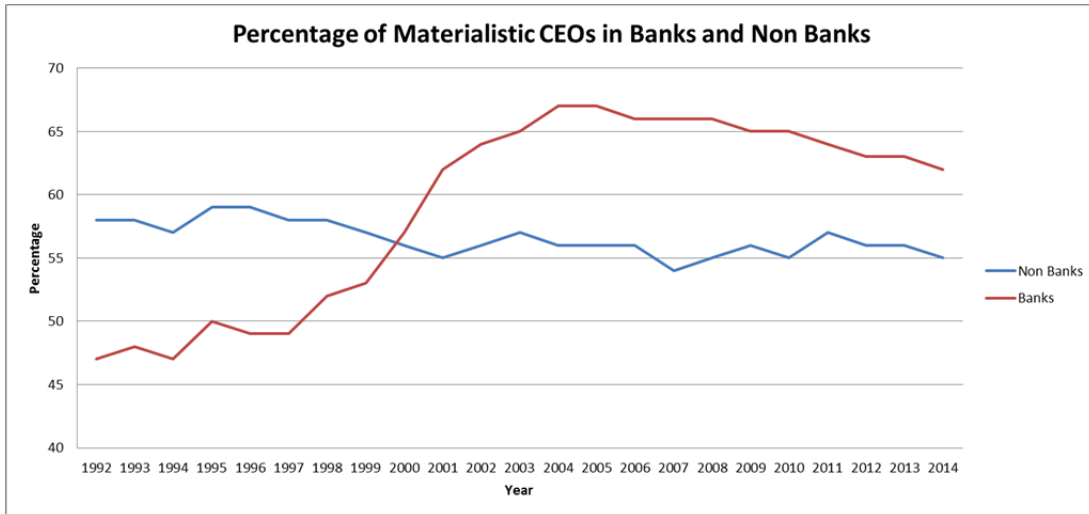
Legend Figure 1: This figure shows the trend in the composition of CEO type (materialistic vs. frugal CEOs) in banks versus non-banks. A CEO is defined as *MATERIAL* if the CEO owns luxury assets, where luxury assets include boats >25 feet, cars worth more than $75,000, a primary residence worth more than twice the average of median home prices in zip codes within the Core Based Statistical Area (CBSA) of his corporate headquarters, or additional homes worth more than twice the average home price in the corresponding CBSA. If a CEO does not own any of these luxury assets, he is defined as being *FRUGAL*.

Table 3
Test of Differences between Trends in Materialistic CEOs

	1992 - 1999	2000 - 2014	Difference
Non-Financial Services Firms	59%	56%	-3% *
Financial Services Firms	49%	65%	16% ***
Difference	-10% ***	9% ***	
Large Financial Services Firms	47%	64%	17% ***
Small Financial Services Firms	51%	66%	15% ***
Bank Holding Companies Only	47%	64%	17% ***

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

Table 3 presents the results of differences in means of the proportion of materialistic CEOs in financial v. non-financial firms across the two periods 1992-1999 and 2000-2014. In addition, this table presents the differences in the proportion of materialistic CEOs across these two sub-periods for three subsamples: large financial services firms, small financial services firms, and a sample of bank holding companies only.

Figure 2
CEO Type and Total Compensation

Total Compensation: Banks and Non Banks

Compensation in the Financial Services Industry

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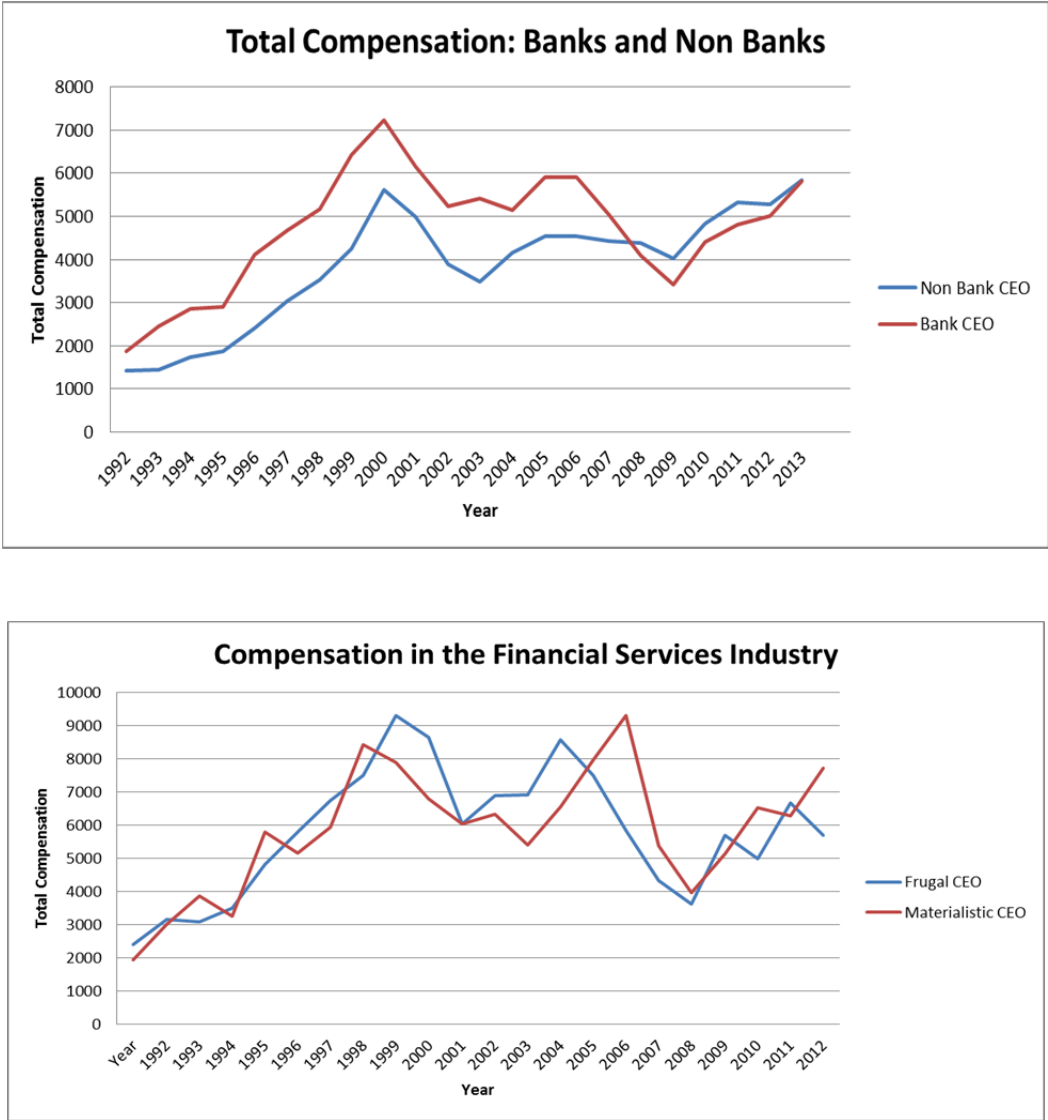
Figure 3
CEO Type and Vega
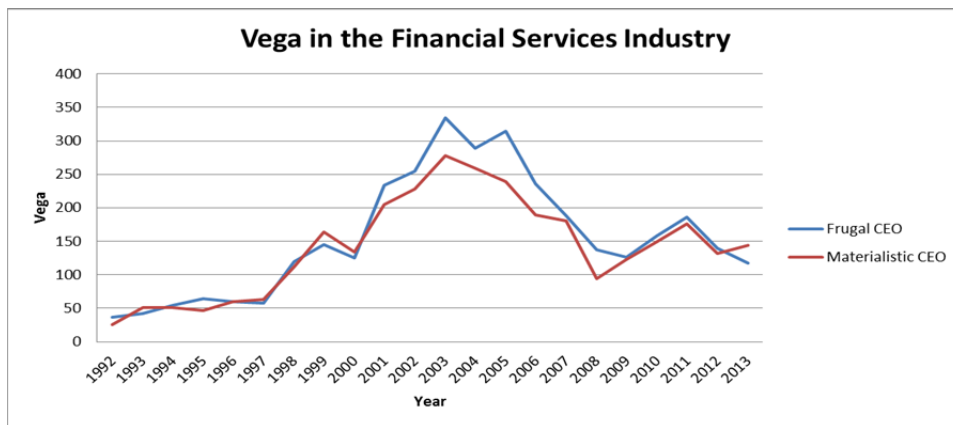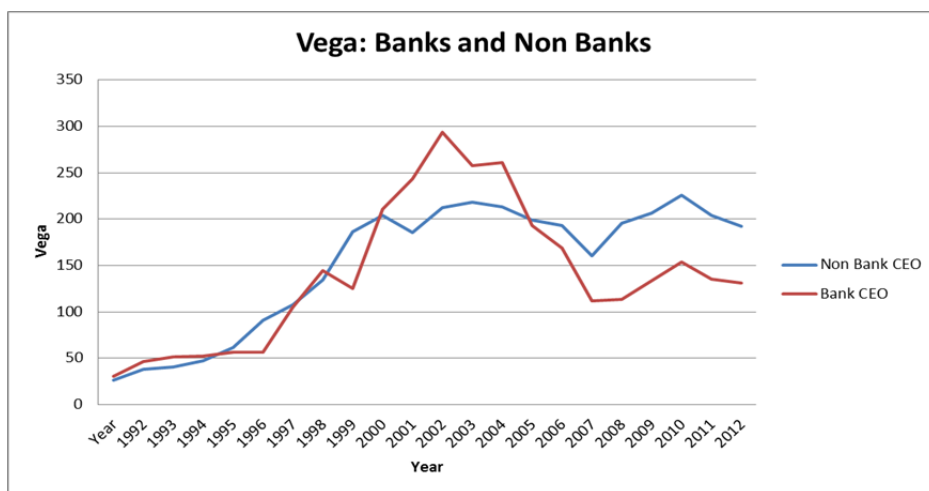
Legend Figure 3: This figure shows the trend in the vega in compensation contracts of bank and non-bank CEOs as well as how this trend varies by CEO type (materialistic vs. frugal CEOs) in banks. A CEO is defined as *MATERIAL* if the CEO owns luxury assets, where luxury assets include boats >25 feet,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

Percentage of Bank CEOs with Certain Traits by Year

Legend:
— Materialistic
···· Narcissism
– – Military
–·– Recordholder
– – Recession
–·– Overconfidence
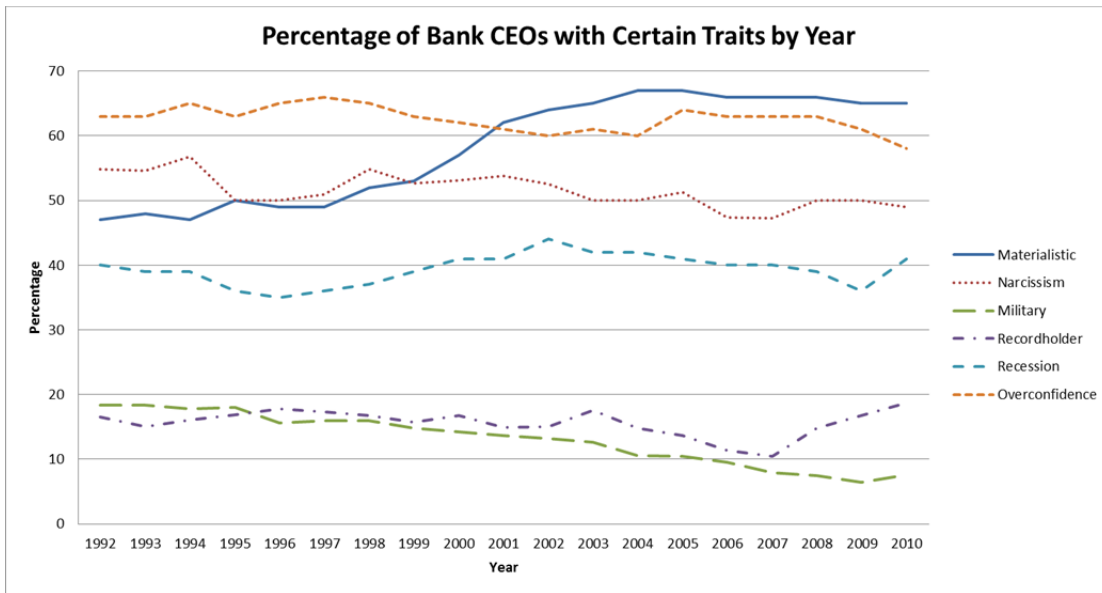
Legend Figure 4: This figure shows trends over time in the prevalence of bank CEOs with certain characteristics. We consider the following traits. A CEO is defined as *materialistic* if he owns luxury assets, where luxury assets include boats >25 feet, cars worth more than $75,000, a primary residence worth more than twice the average of median home prices in the Core Based Statistical Area (CBSA), or additional homes worth more than twice the average home price in the corresponding CBSA. 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 a 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 4
Summary of CEOs' Prior Professional Experience

	CEO Tenure Start Dates		
	Between 1990 and 1999	**Between 2000 and 2009**	**Difference**
Prior Commercial Banking Experience	80%	58%	-22% ***
Prior Investment Banking Experience	10%	18%	8% **
Inside Hire	73%	64%	-9% **
Prior Chief Operating Officer Experience	43%	39%	-4%
Prior Chief Financial Officer Experience	7%	22%	15% ***
	CEO Luxury Asset Ownership		
	Materialistic	**Frugal**	**Difference**
Prior Commercial Banking Experience	60%	68%	8% **
Prior Investment Banking Experience	18%	12%	-6% *
Inside Hire	64%	71%	7% **
Prior Chief Operating Officer Experience	42%	40%	-2%
Prior Chief Financial Officer Experience	14%	17%	3%

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

Table 4 presents the prior professional experience of CEOs with tenures starting in the years prior to the passage of the Gramm-Leach-Bliley Act (1990-1999) and with tenures starting in the years after the passage of this Act (2000-2009). This table also presents the prior professional experience of materialistic vs. frugal CEOs in our sample.

Table 5
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)
INTERCEPT	0.794***	0.803	-1.029	1.421**
	(17.21)	(31.00)	(-1.45)	(3.20)
MATERIAL	-0.133***	-0.036**	-0.151***	-0.059**
	(-2.80)	(-2.18)	(-3.85)	(-3.02)
RETURNS	-0.057*	0.003	-0.012	0.001
	(-1.87)	(0.31)	(-0.29)	(0.04)
VOLATILITY	-1.892***	-0.151	-0.851**	-0.378**
	(-6.26)	(-1.22)	(-2.81)	(-2.28)
BETA	0.093**	0.009	-0.008	0.016
	(2.48)	(0.80)	(-0.29)	(1.29)
DELTA	0.199	-0.058	-0.674*	0.187
	(0.94)	(-0.60)	(-1.82)	(0.87)
VEGA	14.430	1.087	13.895**	-0.981
	(1.36)	(0.82)	(2.45)	(-0.35)
SIZE			0.293**	-0.137*
			(2.46)	(-1.67)
SIZE SQUARED			-0.012**	0.007
			(-2.20)	(1.50)
TIER 1			-0.017*	-0.001
			(-1.93)	(-0.39)
BAD LOANS			-0.438	-0.163
			(-0.94)	(-0.84)
COMM LOANS			-0.049	-0.034
			(-0.21)	(-0.24)
CONS LOANS			0.512***	0.162
			(2.89)	(0.81)
MORTG LOANS			0.191	0.168
			(1.06)	(1.61)
DEPOSITS			-0.635*	-0.295
			(-1.84)	(-1.50)
MATURITY MISMATCH			0.621***	0.145
			(2.69)	(1.06)
MTB			-0.011	-0.005
			(-0.64)	(-0.61)
NON-INT INCOME			0.442***	-0.024
			(2.72)	(-0.26)

Table 5 (Contd.)
Risk Management Index

	COEF.	COEF.	COEF.	COEF.
	(T)	(T)	(T)	(T)
TRADING ASSETS			0.711**	0.228
			(2.10)	(0.37)
MBS			-0.702	-0.343**
			(-1.51)	(-2.27)
NO. OF OBS	1,084	1,084	827	827
Adj. R-Squared	0.13	0.93	0.42	0.93
Year FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	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 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 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
Predecessor Successor Analysis

*RMIi,t = β0 + β1 NEW CEO MATERIALi + β2 SUCCESSORi,t + β3 CHANGE CEO TYPEi + β4 NEW CEO MATERIALi * SUCCESSORi,t + β5 NEW CEO MATERIALi * CHANGE CEO TYPEi + β6 SUCCESSORi,t * CHANGE CEO TYPEi + β7 NEW CEO MATERIALi * SUCCESSORi,t * CHANGE CEO TYPEi + CONTROLSit-1 + YEAR FE + εi,t*

	WITHOUT CONTROLS	WITH CONTROLS
	COEF. (T)	COEF. (T)
INTERCEPT	0.565***	-0.902
	(9.80)	(-1.50)
NEW CEO MATERIAL	-0.041	-0.033
	(-1.42)	(-1.25)
SUCCESSOR	0.036	0.041
	(1.11)	(1.44)
CHANGE CEO TYPE	-0.049	-0.027
	(-0.56)	(-0.87)
NEW CEO MATERIAL × SUCCESSOR	-0.021	-0.019
	(-0.27)	(-0.49)
NEW CEO MATERIAL × CHANGE CEO TYPE	0.210	0.107
	(1.79)	(1.62)
SUCCESSOR × CHANGE CEO TYPE	0.179**	0.214**
	(2.32)	(2.43)
NEW CEO MATERIAL × SUCCESSOR × CHANGE CEO TYPE	-0.289***	-0.326***
	(-2.71)	(-2.58)
Analysis of Changes		
Material CEO to Material CEO	0.015	0.022
	(0.31)	(0.42)
Frugal CEO to Material CEO	-0.095*	-0.090*
	(-1.90)	(-1.84)
Frugal CEO to Frugal CEO	0.036	0.041
	(0.66)	(0.70)
Material CEO to Frugal CEO	0.215***	0.228***
	(3.51)	(2.74)
Test of Differences	*P- value*	*P-value*
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 6 (Cont.)

***Significant at the 1% level; **5% level; * 10% level. Standard errors are clustered by CEO.**
Table 6 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, primary residences worth more than twice the average of the median home prices in the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that CBSA. *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 RMI 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.

Table 7
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.	COEF.
	(T)	(T)
INTERCEPT	0.008	0.003
	(1.18)	(0.36)
INSIDER TRADING	0.003**	0.004***
	(2.09)	(2.69)
PRE-CRISIS	-0.025***	-0.021***
	(-8.84)	(-6.70)
CRISIS	-0.005	0.006
	(-0.93)	(0.80)
BAILOUT	-0.046***	-0.032***
	(-3.94)	(-3.16)
*INSIDER TRADING * PRE-CRISIS*	-0.009***	-0.007***
	(-3.05)	(-2.58)
*INSIDER TRADING * CRISIS*	-0.008*	-0.005
	(-1.82)	(-0.90)
*INSIDER TRADING * BAILOUT*	0.012	0.028***
	(1.40)	(2.91)
SIZE	-0.001	-0.003**
	(-1.63)	(-2.28)
MTB	-0.001	0.001
	(-0.27)	(0.50)
PAST MONTH RETURNS	0.001	0.001
	(0.39)	(1.38)
PAST YEAR RETURNS	0.001	0.001
	(1.35)	(1.19)
NO. OF OBS	3,104	3,648
Adj. R-Squared	0.02	0.02
Year FE	Yes	Yes

Test of Differences	_P-Value_
Materialistic – Frugal	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 materialism of the CEO and insider trading by other senior executives of the firm. *ABNORMAL RETURNS* equals α for net purchases made by executives, where α is obtained from estimating transaction-day specific regressions of daily returns on common factors over the 180-days following each transaction: $(Ri – Rf) = \alpha + \beta_1 (Rmkt – Rf) + \beta_2\ SMB + \beta_3\ HML + \beta_4\ UMD + e$. Ri is the daily return to firm i's equity, Rf is the daily risk-free interest rate, Rmkt 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.

Table 8
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)
INTERCEPT	0.023***	0.022***	0.107***
	(13.57)	(9.89)	(4.19)
MATERIAL		0.002***	0.001***
		(2.59)	(2.37)
RETURNS	-0.014***	-0.013***	-0.016***
	(-7.64)	(-7.85)	(-10.12)
VOLATILITY	0.271***	0.245***	0.218***
	(11.75)	(7.14)	(9.85)
BETA	0.006***	0.007***	0.003
	(6.07)	(6.09)	(2.23)
DELTA	0.000	0.000	0.027***
	(0.01)	(-0.02)	(2.72)
VEGA	-0.115	-0.059	-0.538**
	(-1.08)	(-0.55)	(-2.37)
RMI	-0.002**		0.001
	(-2.37)		(0.16)
SIZE			-0.016***
			(-3.55)
SIZE SQUARED			0.001***
			(3.63)
TIER 1			0.001**
			(2.07)
BAD LOANS			0.320***
			(8.72)
COMM LOANS			0.001
			(0.12)
CONS LOANS			-0.007
			(-1.36)
MORTG LOANS			-0.005
			(-1.24)
DEPOSITS			0.015*
			(1.92)
MATURITY MISMATCH			-0.015***
			(-2.60)
MTB			0.001
			(1.46)
NON-INT INCOME			0.010**
			(2.25)

Table 8 (Contd.)
Firm Tail Risk

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

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

Table 8 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 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.

49

Table 9
Marginal Expected Shortfall

$$MESi,t = \beta 0 + \beta 1\ MATERIALi,t\text{-}1 + CONTROLSi,t\text{-}1 + YEAR\ FE + \varepsilon i,t$$

	COEF. (T)	COEF. (T)	COEF. (T)
INTERCEPT	0.019***	0.020***	-0.040
	(11.37)	(18.23)	(-1.56)
MATERIAL		0.002***	0.002**
		(2.95)	(2.49)
RETURNS	-0.006***	-0.003**	-0.005
	(-2.84)	(-2.16)	(-1.31)
VOLATILITY	0.091***	0.032**	0.060***
	(4.73)	(2.60)	(2.65)
BETA	0.006***	0.006***	0.003*
	(5.77)	(8.05)	(1.91)
DELTA	-0.003	0.007	0.040***
	(-0.14)	(0.42)	(3.87)
VEGA	0.752***	0.582***	0.268
	(3.06)	(3.84)	(0.53)
RMI	-0.002**		-0.002
	(-2.25)		(-1.07)
SIZE			0.008
			(1.86)
SIZE SQUARED			-0.001
			(-0.86)
TIER 1			0.001
			(1.42)
BAD LOANS			0.250***
			(7.72)
COMM LOANS			0.001
			(0.29)
CONS LOANS			-0.009*
			(-1.91)
MORTG LOANS			-0.008*
			(-1.95)
DEPOSITS			0.027***
			(2.91)
MATURITY MISMATCH			-0.021***
			(-3.75)
MTB			0.002***
			(3.01)
NON-INT INCOME			-0.016***
			(-3.06)

Table 9 (Contd.)
Marginal Expected Shortfall

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

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

Table 9 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 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 10
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)
INTERCEPT	0.016***	0.040***	0.017***	0.063***
	(17.26)	(14.30)	(13.85)	(11.91)
MATERIAL	0.002**	0.006**	0.002**	0.008**
	(2.50)	(2.31)	(2.36)	(2.36)
RETURNS	-0.001	-0.016***	-0.008***	-0.054***
	(-0.92)	(-3.49)	(-6.48)	(-6.48)
VOLATILITY	0.034**	0.068***	0.277***	0.128**
	(2.53)	(2.92)	(16.62)	(2.52)
BETA	0.007***	-0.003	0.004***	0.022***
	(9.27)	(-0.71)	(6.59)	(4.54)
DELTA	0.011	-0.071***	0.008	-0.114***
	(0.78)	(-3.77)	(0.78)	(-5.89)
VEGA	0.544***	1.824***	-0.166	1.035**
	(3.21)	(4.30)	(-1.44)	(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
Test of Differences	*P-Value*		*P-Value*	
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 10 presents the results of the relation between CEO materialism and the tail risk and marginal expected shortfall of the firm both during crisis years (2007-2008) and non-crisis years (remaining years). *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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 11
Firm Tail Reward

TAIL REWARDi,t = β0 + β1 MATERIALi,t-1 + CONTROLSi,t-1 + YEAR FE + εi,t

	COEF. (T)	COEF. (T)	COEF. (T)
INTERCEPT	0.022***	0.018***	0.141***
	(9.15)	(8.68)	(4.02)
MATERIAL		0.002***	0.002**
		(2.66)	(2.34)
RETURNS	-0.006***	-0.003	-0.005**
	(-2.87)	(-1.51)	(-2.11)
VOLATILITY	0.378***	0.363***	0.271***
	(11.01)	(10.95)	(8.25)
BETA	0.008***	0.007***	0.002
	(4.78)	(5.78)	(1.46)
DELTA	0.000	0.999	-0.002
	(-0.01)	(0.02)	(-0.18)
VEGA	-0.189	0.013	-0.384*
	(-1.17)	(0.12)	(-1.85)
RMI	-0.002		0.001
	(-0.95)		(0.47)
SIZE			-0.022***
			(-3.79)
SIZE SQUARED			0.001***
			(3.74)
TIER 1			0.001**
			(2.01)
BAD LOANS			0.510***
			(8.94)
COMM LOANS			0.000
			(0.03)
CONS LOANS			0.005
			(0.63)
MORTG LOANS			-0.005
			(-1.07)
DEPOSITS			-0.005
			(-0.41)
MATURITY MISMATCH			-0.002
			(-0.33)
MTB			0.001
			(1.57)
NON-INT INCOME			0.013***
			(2.76)

Table 11 (Contd.)
Firm Tail Reward

	COEF.	COEF.	COEF.
	(T)	(T)	(T)
TRADING ASSETS			-0.017*
			(-1.65)
MBS			0.035
			(0.65)
NO. OF OBS	1,084	1,537	827
Adj. R-Squared	0.87	0.88	0.93
Year FE	Yes	Yes	Yes

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

Table 11 presents the results of the relation between CEO materialism and the tail reward of the firm. *TAIL REWARD* is the average return for a bank during the 5% best 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 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 12
Marginal Expected Surplus

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

	COEF. (T)	COEF. (T)	COEF. (T)
INTERCEPT	0.021***	0.023***	-0.033
	(11.71)	(15.48)	(-1.09)
MATERIAL		0.002**	0.003**
		(2.38)	(2.23)
RETURNS	-0.005**	-0.002	-0.007*
	(-2.30)	(-1.49)	(-1.79)
VOLATILITY	0.107***	0.042***	0.102***
	(5.06)	(2.60)	(3.65)
BETA	0.007***	0.006***	0.005**
	(5.37)	(6.43)	(2.45)
DELTA	0.006	0.018	0.032
	(0.30)	(1.30)	(1.43)
VEGA	0.804**	0.719***	0.201
	(2.51)	(3.55)	(0.28)
RMI	0.002		-0.002
	(1.34)		(-0.98)
SIZE			0.004
			(1.38)
SIZE SQUARED			0.000
			(0.27)
TIER 1			0.001
			(1.38)
BAD LOANS			0.241***
			(5.27)
COMM LOANS			0.000
			(-0.05)
CONS LOANS			-0.008
			(-1.19)
MORTG LOANS			0.000
			(-0.06)
DEPOSITS			0.030***
			(2.93)
MATURITY MISMATCH			-0.017**
			(-2.31)
MTB			0.003***
			(3.60)
NON-INT INCOME			-0.009
			(-1.61)

Table 12 (Contd.)
Marginal Expected Surplus

	COEF.	COEF.	COEF.
	(T)	(T)	(T)
TRADING ASSETS			-0.015
			(-1.53)
MBS			-0.013
			(-0.26)
NO. OF OBS	1,084	1,537	827
Adj. R-Squared	0.77	0.76	0.83
Year FE	Yes	Yes	Yes

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

Table 12 presents the results of the relation between CEO materialism and the marginal expected surplus in banks. *MESUR* is the marginal expected surplus measured as the average return for a bank during the 5% best 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that 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 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.

Variable	Measurement	Data Source
Risk Management Index. (*RMI*)	The risk management index for BHCs as computed by Ellul and Yeramilli (2013). 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 (2013)
Marginal Expected Shortfall (Surplus). (*MES; MESUR)*	The average return for a bank during the 5% worst (best) return days for the banking industry in a year.	CRSP
Tail Risk (Reward). (*TAIL RISK; TAIL REWARD*)	The average return for a bank during the 5% worst (best) return days for the bank in a year.	CRSP
Returns. (*RETURNS*)	The returns over the past 12 months for a bank.	CRSP
Past returns. (*PAST MONTH RETURNS; PAST YEAR RETURNS*)	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. (*VOLATILITY*)	The standard deviation of the past 12 month returns for a bank.	CRSP
Beta. (*BETA*)	The systematic risk of a bank calculated using CAPM using the prior 36 months of returns.	CRSP
The delta for a CEO. (*DELTA*)	The dollar change in a CEO's wealth for a 1% change in stock price.	ExecuComp
The vega for a CEO. (*VEGA*)	The dollar change in a CEO's wealth for a 0.01 change in the standard deviation of returns.	ExecuComp
Firm size. (*SIZE; SIZE SQUARED)*	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. (*TIER-1*)	The ratio of a bank's tier-1 capital to the book value of total assets.	Compustat/ Call Reports
Bad loans. (*BAD LOANS*)	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. (*COMM LOANS*)	The ratio of commercial and industrial loans to total assets.	Compustat/ Call Reports
Consumer loans. (*CONS LOANS*)	The ratio of consumer loans to total assets.	Compustat/ Call Reports
Mortgage loans. (*MORTG LOANS*)	The ratio of mortgage loans to total assets.	Compustat/ Call Reports
Deposits. (*DEPOSITS*)	The ratio of total deposits to total assets.	Compustat/ Call Reports
Maturity mismatch. (*MATURITY MISMATCH*)	The ratio of deposits and short term borrowings less cash to total liabilities.	Compustat/ Call Reports
Market to book. (*MTB*)	The ratio of market capitalization to the book value of shareholders equity.	Compustat/ CRSP
Non-interest income. (*NON-INT INCOME*)	The ratio of non-interest income to the sum of interest income and non-interest income.	Compustat/ Call Reports
Trading assets. (*TRADING ASSETS*)	The ratio of total trading assets to total assets.	Compustat/ Call Reports
Mortgage backed securities. (*MBS*)	The ratio of all mortgage backed securities to total assets.	Compustat/ Call Reports

Definition of Variables and Data Sources (Contd.)

Variable	Measurement	Data Source
Net insider trades. (*INSIDER TRADING*)	The ratio of net insider purchases to the sum of total insider purchases and sales.	Thomson Reuters
Pre-crisis period. (*PRE-CRISIS*)	A dummy variable that equals 1 for the pre-crisis years, July 2006 through June 2007.	
Crisis period. (*CRISIS*)	A dummy variable that equals 1 for the crisis years, July 2007 through June 2009.	
Bailout period. (*BAILOUT*)	A dummy variable that equals 1 for the bailout years, October 2008 through June 2009.	
CEO wealth. (*WEALTH*)	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. (*MATERIAL*)	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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that CBSA.	Find Out the Truth.com (FOTT)
Change in CEO type to materialistic. (*NEW CEO MATERIAL*)	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. (*SUCCESSOR*)	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. (*CHANGE CEO TYPE*)	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)

Appendix B

I] Discussion of the Real Estate Data

We define an executive as materialistic if they own a primary residence worth more than two times the average of median home prices in zip codes in the corresponding Core Based Statistical Area (CBSA) of their firm's headquarters or if they own a secondary residence worth more than 2 times the average of median home price in zip codes in that property's CBSA. Thus our measure of materialism depends heavily on the real estate values we can obtain for each executive. In the following pages we discuss the steps we have taken to assure ourselves of the veracity of the values of properties owned by an individual.

FOTT provides us with an address history for each executive, not just a summary of property title records or real estate transactions records. This means we have data on new construction, rentals, and properties held in the name of another entity. Our data also provides us with the years when the individual was associated with the property, so we can properly assign transactions through time to the correct individual.

We measure value using an average of estimated property values from Eppraisal.com, Zillow.com, Trulia.com, and Realtor.com or as of 12/31/2015. For robustness, we also measure value from a combination of sales prices or estimated values (in cases of rentals, new construction, or missing sales records) in the year the executive moved into the property.

We demonstrate using the Manhattan CBSA.

Manhattan Residential Zip Codes	
Central Harlem	10026, 10027, 10030, 10037, 10039
Chelsea and Clinton	10001, 10011, 10018, 10019, 10036
East Harlem	10029, 10035
Gramercy Park and Murray Hill	10010, 10016, 10017, 10022
Greenwich Village and Soho	10012, 10013, 10014
Lower Manhattan	10004, 10005, 10006, 10007, 10038, 10280
Lower East Side	10002, 10003, 10009
Upper East Side	10021, 10028, 10044, 10065, 10075, 10128
Upper West Side	10023, 10024, 10025
Inwood and Washington Heights	10031, 10032, 10033, 10034, 10040

Below we provide current median sales prices for each zip code as provided by Trulia.com. Median values provided by Zillow.com, Realtor.com, or Zipcodes.com (historical data is provided by Zipcodes.com and must be purchased) yields similar values.

Zip Code	Median Sales Price
10001	$1,575,000.00
10002	$1,525,000.00
10003	$1,540,000.00
10004	$1,200,000.00
10005	$1,785,000.00
10006	$740,000.00
10007	$2,800,000.00
10009	$1,284,375.00
10010	$1,250,000.00
10011	$1,812,500.00
10012	$1,600,000.00
10013	$3,150,000.00
10014	$2,031,000.00
10016	$925,000.00
10017	$850,000.00
10018	$1,200,000.00
10019	$1,462,500.00
10021	$1,730,000.00
10022	$866,500.00
10023	$1,773,469.00
10024	$1,792,120.00
10025	$1,300,000.00
10026	$890,000.00
10027	$837,500.00
10028	$1,735,000.00
10029	$477,000.00
10030	$540,000.00
10031	$651,068.00
10032	$454,000.00
10033	$415,000.00
10034	$470,000.00
10035	$750,000.00
10036	$1,050,000.00
10037	$477,867.00
10038	$1,043,706.00
10039	$797,800.00
10040	$689,000.00
10044	$540,000.00
10065	$1,325,000.00
10075	$998,000.00
10128	$1,159,000.00
10280	$765,000.00
Mean	$1,196,604.88

Based on this data, an executing working in Manhattan would need to own/rent a home with an estimated value just under $2,400,000 to be considered materialistic under our main measure of real estate. In robustness analysis we increase the threshold to 5 times the average of median home prices in the relevant CBSA. Under this criterion, an executive must own/rent a home with an estimated value just under $6,000,000.

New construction, rentals, and properties held in the name of another entity provide potential issues with identification and estimation. Below, we discuss these properties.

New Constructions

Many executives choose to construct new homes. Our address history provides us with the address of the home but property records on purchase price will generally only have data on the price paid for the land. Internet resources provide us with information to determine if a home is in fact new construction, and provide an estimate of the property's value which we can use to compute our measure of materialism.

To illustrate our process to determine new construction and estimate the value, consider the following property: 1835 73rd Avenue Ne, Medina, WA 98039. This home belongs to Bill Gates and given that the home has its own Wikipedia page, it does not seem like an invasion of privacy to discuss it. To learn whether the home was new construction and get an estimated value for the property we can use the real estate aggregator Zillow.com. Below is the Zillow link to the Gates' property:

http://www.zillow.com/homes/1835-73rd-Ave-NE,-Medina,-WA-98039_rb/?fromHomePage=true&shouldFireSellPageImplicitClaimGA=false

Zillow notes that the original purchase was for $2,050,000 in 1988. But, given that construction of the property itself did not begin until 1994, we have evidence that the purchase in 1988 was for land alone. We can verify whether the original purchase was for an existing home or for vacant land from information provided by the King County Department of Assessments. Below is the link to the Gates' property:

http://info.kingcounty.gov/Assessor/eRealProperty/Dashboard.aspx?ParcelNbr=9208900079

The department of assessment indicates that construction took place in 1994 and the tax roll history indicates the years taxable and appraised improvements to the land were first assessed to the property. Therefore, we know the purchase was for vacant land and the home subsequently built on the land.

Zillow also provides a current estimate of the value of the home at $161,352,038. While this property might be particularly hard to value, most homes have several relevant comparison properties to aid in the process. Moreover, homes of such value that it is difficult to find relevant comparisons are almost certainly going to cost more than 2 times the average price of homes in the relevant core based statistical area, so even though the dollar estimate is noisy, this will not lead to classification issues regarding our main measure of materialism.

At this point, we have verified that the home itself was new construction, and have an estimated value to use to compute our measure of materialism. Similar information can be gleaned for all properties in our sample in that we can compare the year a home was constructed to the year land was purchased via Internet sources and from the county tax assessor. Because the data provided to us by FOTT is an address history, and not a home purchase history, it is highly unlikely that homes acquired through new construction are missing from our sample or have incorrect estimates for their value. Our data also provides us with the years an individual is associated with a particular address so we can determine if the individual was associated with the home when it was constructed, or purchased the home years later (and in such cases we can use the purchase price as an estimate in that year).

Given that values for new construction are always estimates, we have two options when computing our value of materialism. We can take the estimated value of all homes as of 2015 and scale by the CBSA of the area in 2015, or we can take an estimated value in the year of acquisition (or the purchase price when available) by solving for the estimated value in the year of acquisition using the following equation:

61

$$\frac{E_{t-acquisition}}{A_{t-acquisition}} = \frac{E_{2015}}{A_{2015}}$$

Where E equals the estimated value and A equals the assessed value. While the ratio of estimated to assessed value is not constant over time (and the variability can vary geographically), it is hard to think of a theoretical argument for how its variance could be related bank RMI scores or tail risk, which it would need to be in order for classifications based on the error to drive our results. Our estimates of CEO materialism are correlated at over 99% whether using 2015 estimated values or a combination of actual purchase prices and estimated values from the year of acquisition.

Rental Apartments

Many executives in our sample choose to rent. This is particularly common in Manhattan where an executive may rent an apartment close to the office. It is not clear if a property an executive lives in and rents should be treated identically to one which was purchased, but we are able to collect information on properties an individual rents and verify the accuracy of such information as follows.

Our address history provides information on where an executive lives even if the property is a rental. From this information we can gain estimates of property values the same way we do for all properties. One concern could be the ability to differentiate between different units in a given building. Our address history also provides apartment numbers/designations so we are able to differentiate a penthouse condominium from another living space and accurately look up the estimated value of the correct space.

For an example of information that can be collected on condominiums (which an executive may own or rent) consider the residential condominium building located at 3 Commonwealth Avenue, Boston MA, 02116. The following link provides data from the assessor's office for the city of Boston for this building.

http://www.cityofboston.gov/assessing/search/?parcel=0502825000

The building has a master parcel number 0502825000, but each unit has its own parcel number distinguished by changing the last digit of the master parcel. Each individual unit has separate information including assessed taxable values, so these units are not identical. Our address history provides apartment or unit numbers so if we were interested in this property we could gather information for the appropriate unit in the building. The following link provides Zillow information for Apartment 3 at 3 Commonwealth Avenue:

http://www.zillow.com/homedetails/3-Commonwealth-Ave-APT-3-Boston-MA-02116/59166810_zpid/

Zillow provides a current estimated value for this specific unit, and past sales prices and assessed values, which can be verified through the assessor's office indicating that the correct unit is presented.

Real Estate held in Another Entity's Name

In some cases an executive is living in a property for which legal title belongs to another entity. This could be a spouse, but is often commonly related to family trusts. This can occur to administer the estate of a deceased relative, or be an ongoing event for personal financial reasons. Additionally, individuals occasionally transfer property held in a controlled trust for nominal sums of money ($1.00 in many cases). Of course this does not represent a true sales price or market value of the property. As noted before, our address history provides evidence that an executive was living at a home even if it is owned by another individual or trust. The address history also provides the dates the individual was associated with the property, so we can locate sales transactions if they exist and we can estimate property values at the time of transfer in addition to current estimated values. In these cases, transfer of title often does not coincide with the years an individual was present in the home. For example, an individual might occupy a home in 2000 while it is held in trust and then might purchase the home for a market or nominal fee in 2004. We can use estimated values for the year 2000, the year 2004, or the year 2015 and scale by the appropriate cost of real estate in the property's core based statistical area for that year. As discussed above, estimates of materialism using current or past property estimates are correlated at over 99%.

II] Measures of Materialism

Our primary measure of materialism is 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 the Core Based Statistical Area (CBSA) of the corporate headquarters, and additional residences worth twice the average home prices in that CBSA, and 0 otherwise.

To verify that we are adequately capturing the materialistic tendencies in an individual, we construct and verify the robustness of our results to several alternate measures of materialism. We discuss these alternate measures (some are already mentioned in the main body of the paper) in the following pages.

We recalculate a binary measure of materialism using different cut-off values – vehicles with a list price of $110,000 or greater, boats 40 feet and longer, and homes worth at least 5 times the average of median home prices in the zip codes of their firm's CBSA. While the cutoff figures are significantly different, the measure is highly correlated with the original measure. Under these requirements, all frugal CEOs under the original measure are still frugal under this measure, and all materialistic CEOs under this measure are materialistic under the original measure. The only individuals who are classified differently are those who were originally classified as materialistic specifically because of assets within the higher and lower range of the two methods. As such, the measures are highly correlated and yield nearly identical results.

Next, we develop an ordinal measure of materialism by counting the number of materialistic assets an individual owns all individuals who are frugal using a binary measure have 0 lavish assets so this measure really just creates variation in the group defined as materialistic. We can calculate this measure in real time, or by choosing the peak level and applying that as a static measure. This measure has some appeal in that one aspect of materialism is this desire to keep acquiring more goods over time and the measure captures that. However, it is not clear that it is appropriate to treat an individual who has purchased two $100,000 cars as more materialistic than an individual who has purchased one $250,000 car. Results using an ordinal measure are highly correlated with results using a binary measure. Given that both measures classify frugal CEOs in the same manner, the only way this measure would create different results is if the associations between materialism and our dependent variables were distributed like an inverted U where "moderately" materialistic CEOs drove the results and highly materialistic CEOs behaved as frugal CEOs.

Given that our real estate data is more complete than data for vehicles or boats, we recalculate materialism only using real estate data. Under this measure, every individual classified as frugal is still classified as such, and all individuals who owned a materialistic home are classified as materialistic. Individuals classified as materialistic based solely on vehicle or boat ownership are now classified as frugal. The measure is highly correlated with our original measure and our empirical results are similar, though in some cases they are stronger when we use vehicle and boat data, suggesting that it is informative and that such individuals should be considered materialistic under our methodology. We also create three groups – frugal, materialistic without real estate, and materialistic with real estate – and compare results for these groups to one another. We find that the two materialistic groups are statistically similar to one another and significantly different from the frugal group.

We calculate a continuous measure of materialism based on the dollar value (or estimated value) of an individual's assets. We can calculate this measure in real time or as a static measure using the peak value of assets. Because we do not have boat prices available to us, they are estimated from a model that considers length, manufacturer, model, and year. While these inputs are all strong determinants of price, the unique nature of boats and the ability to customize means that individual observations could be poorly estimated. A continuous measure potentially offers advantages in that a $20 million dollar home might be indicative of a higher level of materialism than a $10 million dollar home (assume in the same geographic location). However, this is not a given. Particularly as it pertains to our hypotheses, it is possible that after a certain level of materialism increases are not predictive. Moreover, in our binary measure we have no reason to believe our classification is influenced by an individual's wealth as every CEO in our sample can easily afford a $75,000 vehicle, a boat greater than 25 feet long, or a home worth twice the average of median home prices in their firm's CBSA. However, a CEO's wealth can influence a continuous

measure. The richest CEOs in our sample can afford assets worth more than the entire net worth of the least rich CEOs in our sample. This potentially leads to mis-measurement. To address this we can scale the value of assets by an individual's wealth but now the measure has numerator and denominator affects that can vary independently. Assume a CEO with a net worth of $100 million (primarily from stock in his firm) owns assets worth $10 million. If in the next year his firm's stock price increases by 20% and his net worth increases by $20 million that individual has to spend another $2 million on vehicles, boats, or homes or else his measured value of materialism will decrease even though there is no reason to believe the individual has become less materialistic simply because his net worth increased. Further, it is likely not reasonable to compare spending rates for ultra-rich individuals. As wealth increases an individual generally spends a smaller proportion of wealth on real estate, vehicles, or boats. While in theory there is no limit to the value of these assets an individual can purchase, in practice there likely is. Consider an individual worth $50 million dollars. Such an individual might purchase a home worth $10 million dollars, a yacht for $4 million, and own $1 million in vehicles. This individual has spent 30% of their net worth on these assets. Now consider an individual worth $500 million. It is highly doubtful that this individual would need to spend $150 million on real estate, vehicles, and boats to be considered as materialistic as the first individual. There is a practical limit on how much one spends on these things. Finally, it is not clear that the marginal dollar spent on a vehicle is equivalent to the marginal dollar spent on a home nor is an appropriate weighting factor obvious. While a continuous measure has intuitive appeal, it also has many limitations and weaknesses. That said, it still exhibits a strong correlation with our binary measure (the CEOs with more valuable assets are going to be classified as materialistic using a binary measure) and our results are similar. Results using a continuous measure are sensitive to outliers in terms of wealth or asset values and winsorizing the data produces more stable and consistent results.

To conclude, our choice of the primary measure of materialism using the binary model was motivated by the high correlation of this measure with all of the above alternative measures, the ease of its interpretation, the ability to estimate certain models using this measure, and last but not the least, the simplicity of the measure.