The Use of Fair Values to Assess Management's Stewardship: An Empirical Examination of UK Real Estate Firms

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

The Financial Accounting Standards Board (FASB)/ International Accounting Standards Board (IASB) proposed Conceptual Framework solidifies stewardship as a primary financial reporting objective. Concurrently, fair value (FV) continues to be emphasized in FASB and IASB standards. In this study, using data from real estate firms in the UK, I test whether FVs provide stewardship-relevant information incremental to information provided by historical costs. Measuring stewardship by changes in CEO cash compensation and FVs through revaluations of investment properties, I find FVs provide stewardship information beyond historical costs; however, FVs must be supported by external appraisals to be useful. Further, FVs help to explain the traditional association between stock returns and compensation. The actual realization of FV changes through sale continues to be rewarded through compensation, meaning the full compensation value of FV changes is not given until realized. FV changes provide more useful stewardship information when FV estimates are of higher quality or when the CEO is more strongly governed. I also find that higher sensitivity to management effort, proxied by firm growth opportunities, makes FV changes more stewardship-relevant. Overall, I conclude that for UK real estate firms, FVs are useful for assessing management's stewardship with improvements in estimate quality and sensitivity to management effort increasing stewardship-usefulness; however, historical costs continue to be relevant for stewardship. My thesis provides insight into what information best captures management stewardship.

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Chapter 1
Introduction

In this paper, I explore whether fair values (FVs) provide information that is useful in assessing management's stewardship beyond historical costs (HCs). The FASB/IASB Conceptual Framework exposure draft (May 2008) retains stewardship as a component of decision-usefulness, with a status equal to the prediction of cash flows. Meanwhile, standard setting continues to emphasize FVs; however, little academic research has empirically explored whether FVs provide information that is useful in assessing management's stewardship.

Standard setters generally refer to stewardship as management's responsibility as custodian of firm resources, which includes effective and efficient use of those resources.[1] O'Connell (2007) notes only limited research on stewardship has been done and recognizes many topics remain unexplored. He calls for more research into stewardship, stating "accounting standards-setters...may be somewhat disappointed at the relative dearth of relevant empirical work" (p. 218). Further, Landsman (2007) argues "The key question for policy makers and academic researchers alike is whether fair value-based financial statements improve information investors receive relative to information provided by historical cost-based financial statements." While numerous papers consider FVs with respect to the valuation objective of financial reporting, limited theoretical and empirical work attempt to answer this question for the stewardship objective.

FVs use in financial reporting has been growing steadily over the past several decades. This usage will be further accelerated as more countries around the world adopt International Financial Reporting

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[1] For example, in Statement of Financial Accounting Concepts No. 1 (SFAC 1), the FASB describes stewardship in paragraph 50 as:

> "Management of an enterprise is periodically accountable to the owners not only for the custody and safekeeping of enterprise resources but also for their efficient and profitable use."

Standards (IFRS), which allow the use of FVs to a greater extent than many national standards.[2] For example, IAS 16, "Property, Plant and Equipment", and IAS 40, "Investment Property", allow companies to choose to record non-financial assets at FV, which is not currently allowed by numerous standards, including Canada and the US. Furthermore, the FASB continues to expand its use of FVs with its issue of Statement of Financial Accounting Standard (SFAS) 159, "The Fair Value Option for Financial Assets and Liabilities" (February 2007). The FASB also has a joint project with the IASB entitled "Financial Instruments: Improvements to Recognition and Measurement", which may allow reversals for other-than-temporary declines in market value.[3] The use of FVs continues to be controversial, with opponents suggesting FVs deepened or even caused the credit crisis of 2008/2009 by forcing recognition of unreasonable FVs that did not reflect the value to be realized on eventual sale (e.g. "Are Bean Counters to Blame", A. Sorkin, The New York Times, July 1, 2008). Early in 2009, the FASB yielded to FV opponents by softening FV requirements in several specific situations.[4] Proponents argue that FVs provide users with relevant, timely information. Thus, continued research into the benefits and shortcomings of FVs informs the on-going debate.

I chose real estate firms in the United Kingdom (UK) from 1994 to 2005 for my sample since UK GAAP required presentation of investment properties at FV, while HCs were disclosed and HC gains/losses were shown in a supplementary financial statement, allowing a comparison of FVs and HCs. Further, since 1995, real estate firms listed on the main market of the London Stock Exchange (LSE)

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[2] IFRS contains FV options for IAS 16, "Property, Plant and Equipment"; IAS 38, "Intangible Assets"; IAS 40, "Investment Property"; and IAS 41, "Agriculture". FV is also required for most financial assets and liabilities under IAS 39, "Financial Instruments: Recognition and Measurement", and impaired tangible and intangible assets under IAS 36, "Impairment of Assets".

[3] Source: http://www.fasb.org/project/fi_improvements_to_recognition_and_measurement.shtml; consulted on January 29, 2008; and http://www.fasb.org/board_meeting_minutes/12-15-08_fi.pdf; consulted on February 25, 2009.

[4] See "U.S. moves to ease 'fair value' accounting rules," The Globe and Mail, S. Stewart, April 3, 2009. Under the revised rules, the FASB allows firms to ignore sales of comparable assets for assessing FVs of their own assets when the related sales are not orderly. Further, firms can avoid writing down debt securities when they are more likely-than-not to hold them until maturity, where previously firms were required to demonstrate they had the ability to hold the debt securities until maturity.

disclose detailed compensation data. By using UK real estate firms, I test the stewardship usefulness of FV estimates in a setting where FVs are required for all firms for an economically significant percentage of assets, and where assets do not actively trade on an organized exchange, making the setting rich for performing FV tests.

I hypothesize that FVs provide stewardship-relevant information beyond the information provided by HCs. To measure stewardship, I use changes in CEO cash compensation, which is chosen since it is identified as a key stewardship-related decision. See for example, FASB/IASB Conceptual Framework exposure draft paragraph OB12:

> "Management's performance in discharging its responsibilities, often referred to as stewardship responsibilities, is particularly important to existing equity investors when making decisions in their capacity as owners about whether to replace or reappoint management, *how to remunerate management*, and how to vote on shareholder proposals about management's policies and other matters" (*emphasis added*).

Further, stewardship fits well into an agency framework since stewardship responsibility to shareholders stems from the separation of ownership and control, and the compensation contract is often used to address agency concerns. For the principal output of FV accounting, I use annual revaluations of investment properties, which represent FV increases or decreases from the previous year end (i.e. the last measurement date). HC accounting produces the principal output of gains/losses on final sale relative to original cost, which are available for my sample.

Using pooled linear regression, I find that both revaluations and HC gains/losses are associated with changes in CEO cash compensation beyond the portion explained by earnings changes, earnings levels, stock returns, permanent write-downs, and current year gains/losses on investment property sales, supporting my first hypothesis. These findings continue to hold when I use total compensation, use rolling averages of revaluations, or adjust revaluations for average industry performance. Overall, my result suggests that optimal reporting for stewardship purposes includes both FV and HC information. I also find that CEO compensation is generally associated with earnings, but not earnings changes, suggesting CEOs are rewarded for earnings above a benchmark level of zero earnings. I find weak evidence that compensation is sensitive to investment property value impairments, recognized under both FV and HC accounting, which extends Adut, Cready and Lopez's (2003) notion that CEO's are not always protected from unusual write-downs; however, this result should be interpreted with caution since it does not hold consistently when I alter modeling choices.

Next, I test Ijiri (1975) and Gjesdal's (1981) belief that accounting information must be 'hard' to be useful for stewardship purposes. Ijiri (1975) defines the term as follows: "A 'hard' measure is one constructed in such a way that is difficult for people to disagree" (p.36). In the stewardship context, hard information must be objective and verifiable. I test whether improvements in estimate objectivity and verifiability (or decreases in subjectivity) lead to increased stewardship-usefulness. This test also ties into the compensation literature, since increases in hardness are consistent with the concept of increasing signal-to-noise ratios (e.g. Lambert and Larcker 1987). Specifically, I use the presence of external appraisals, the use of Big N auditors, strong corporate governance, and less estimate bias to represent improvements in estimate objectivity and verifiability. I find that external appraisals are necessary for stewardship-usefulness; without consistent and comprehensive external appraisals, revaluations are not stewardship-useful, supporting the need for stewardship information to be 'hard'. Further, I find measures of strong corporate governance, notably Board of Directors (BOD) independence, the CEO *not* acting as Chairman, and the CEO *not* serving on the compensation committee, also improve the stewardship-usefulness of revaluations. I find weak evidence suggesting that the presence of a Big N auditor or less-biased FV estimates also increases stewardship-usefulness. BOD size does not appear to influence stewardship-usefulness of revaluations. Overall, my testing finds that compensation committees believe strong estimates are necessary to capture management stewardship, presumably due to the potential for estimation error and bias.

In additional tests, I find that as governance quality increases, the stewardship weighting for revaluations increases, while the weighting for realized HC gains/losses decreases, implying a substitution effect between FV and HC based on estimate confidence. Further, through principal components analysis, I find that a lack of CEO power and estimate quality most strongly influence the extent of stewardship usefulness; however, revaluations are stewardship-relevant even when these traits are absent.

I also test whether increased sensitivity to management effort increases the stewardship-usefulness of revaluations (i.e. when revaluations are more controllable by management through effort), testing the theoretical findings of Lambert and Larcker (1987) and Banker and Datar (1989). I measure sensitivity to management effort through firm-specific growth opportunities, which I proxy by net CEO-specific investment property additions and opening market-to-book ratio. For both proxies, I find stewardship relevance of revaluations is increasing in firm-specific growth opportunities, indicating that compensation committees recognize and reward the component of FV changes attributable to CEO effort.

Finally, I test whether the CEO-specific variance or persistence of revaluations influences stewardship-usefulness of revaluations. Evidence in the compensation literature (e.g. Banker and Datar 1989) finds that performance measures' usefulness decreases as variance increases. Further, Baber, Kang and Kumar (1998) find performance measures are more heavily weighted when persistent. In my sample, I find no evidence that variance or persistence of revaluations influences stewardship-usefulness, contrary to the above findings, which may stem from my relatively short time series.

Overall, I connect the existing stewardship, compensation, and FV literatures by finding that FVs can be adequately reliable to be used for stewardship purposes when externally appraised. External appraisals increase FV estimate hardness to the rigorous level required for stewardship. Further, FV estimates are more stewardship-useful when developed under strong governance and when management effort is best captured. Nonetheless, the actual realization of these FV changes (i.e. HC gains/losses on sale) continues to be useful for stewardship purposes, suggesting that compensation committees hold back the full stewardship reward for FV changes until realized through actual sale. This finding is contrary to the FV valuation literature that generally finds HCs lose valuation-usefulness in the presence of FVs. Finally, revaluations explain much of the traditional association between stock returns and compensation, suggesting that FV changes may be an omitted correlated variable in the compensation equation. To standard setters, my study suggests that maximum stewardship information is provided by a dual financial reporting system that reports both FVs and HCs, inconsistent with IAS 40, which requires only FVs.

Readers are cautioned that my results stem from specifically investigating the real estate industry in the UK, which means that my findings will include any idiosyncratic effects for characteristics specific to this setting. The UK may have specific characteristics that influence the relationship between CEO compensation and FVs. Further, investment properties can be viewed as distinct from other property, plant, and equipment. This uniqueness is demonstrated by IFRS having a separate standard solely for investment properties and Christensen and Nikolaev's (2010) finding that FVs are chosen for investment properties much more often than for other property, plant, and equipment, and intangibles upon adoption of IFRS. Finally, I investigate the stewardship-relevance of FVs in only the CEO compensation setting. Changes in CEO compensation may capture only certain facets of management stewardship and may be influenced by factors other than management stewardship. Consequently, readers are cautioned when extending my findings beyond the specific setting used. Future research is needed to determine if my results hold in more general settings.

A contemporaneous working paper by Livne, Markarian and Milne (2009) tests the relationship between FVs and compensation for US banks; however, the authors focus on whether compensation contracting gives CEOs incentives to invest in risky assets. Nevertheless, they find unrealized FV gains/losses do explain total staff spending, but not CEO bonuses. There are several key differences between their setting and my setting: (1) their measure of unrealized FV gains/losses also includes realized gains/losses, while my setting allows differentiation of unrealized and realized gains/losses, a difference that is essential to the value of my study; (2) annual unrealized FV gains/losses are relatively minor in their setting versus my setting (mean 0.1% of total assets versus 5.1% of total assets); (3) unrealized FV gains/losses are based on market-determined prices in their setting, while my setting requires judgment in FV estimates; and (4) the bank setting used by the authors exists in a more specific regulatory framework, producing results that are less generalizable.

The remainder of my dissertation is organized as follows. In Section 2, I review the literature and form hypotheses; in Section 3, I provide background for my setting; in Section 4, I discuss my research design; in Section 5, I discuss my sample selection and descriptive statistics; in Section 6, I review my empirical results; in Section 7, I perform robustness tests and additional analyses; and, in Section 8, I conclude.

Chapter 2
Literature Review and Hypothesis Development

2.1 Introduction

Agency problems stemming from the separation of ownership and control create the need for stewardship reporting (Sunder and Yamaji 1999, p.25). In many modern corporations, business owners (i.e. shareholders) have little or no control over the day-to-day decision making at their businesses, rather shareholders choose stewards (i.e. CEOs) to manage business affairs. Consequently, shareholders need information from stewards to understand how their businesses have been managed. Standard setters recognize that financial reporting facilitates key stewardship-related decisions. In fact, all of the FASB, CICA, IASB and the Institute of Chartered Accountants in England & Wales (ICAEW) include stewardship as an objective of financial reporting. Generally, the key stewardship-related decisions are identified as: (1) how to compensate management?; and (2) should management be retained or replaced?

Academics typically discuss stewardship in the context of agency theory (e.g. Bushman and Indjejikian 1993; Lambert 2001; Bushman, Engel and Smith 2006), since stewardship demand for information flows from the separation of ownership and control. In this context, stewardship reporting provides managerial performance information that may be used to minimize agency costs through the efficient design of managerial compensation contracts, among other agency cost minimization techniques. Based on standard setter and agency views of stewardship, I focus on incentive contracting with management to measure stewardship.

In this section, I review the meaning of stewardship, apply it to financial reporting, link the concepts of stewardship and FV, and then form hypotheses.

2.2 Stewardship

2.2.1 Objectives and Responsibilities of the Steward

Historically, stewardship responsibility extended only to the safekeeping of assets. Over time, stewardship responsibility has extended to include effective and efficient management of those assets. Birnberg (1980) identifies four stages of development for stewardship: (1) pure custodial; (2) traditional custodial; (3) asset utilization; and (4) open ended. Under pure and traditional custodial stewardship, the steward is responsible only for safekeeping, with traditional custodial requiring certain skills to maintain the asset (e.g. livestock) versus only safekeeping under pure custodial (e.g. gold coins). Under asset utilization, the steward is responsible for making asset allocation decisions that will achieve objectives established by the owner. Finally, under open-ended stewardship, the steward is given "strategic control" (Birnberg 1980, p. 74) of the assets and has the responsibility to not only achieve objectives, but also to establish those objectives. Stage (4) is generally consistent with major standard setters' views of stewardship responsibility; for example, in Statement of Financial Accounting Concepts No. 1 (SFAC 1), the FASB describes stewardship as follows:

> "Management of an enterprise is periodically accountable to the owners not only for the custody and safekeeping of enterprise resources but also for their efficient and profitable use" FASB SFAC 1, paragraph 50.

The FASB and IASB use the terms stewardship and accountability interchangeably, which is consistent with Ijiri (1975), who applies the concept of accountability to include both traditional stewardship and modern performance issues, such as efficiency and effectiveness. UK GAAP refers to "proper, efficient and profitable use" of assets (Accounting Standards Board, Statement of Principles for Financial Reporting, paragraph 1.3(a)), while the FASB/IASB Conceptual Framework exposure draft is consistent with SFAC 1, with the additional inclusion of "ensuring that the entity complies with applicable laws, regulations, and contractual provisions" (FASB/IASB Conceptual Framework exposure draft paragraph

OB12); the current IASB Framework describes stewardship only as "the accountability of management for the resources entrusted to it" (paragraph 14), while Canadian GAAP does not describe what constitutes stewardship responsibility.

In conclusion, the contemporary and standard setter views of stewardship suggest stewardship encompasses safeguarding of assets as well as their effective and efficient use. Further, the steward is responsible for forming company objectives to best manage company resources. Finally, stewardship and accountability are considered synonymous.

2.2.2 Objectives of Stewardship Reporting

Since stewards are responsible not only for the safekeeping of assets, but also efficient and effective use of such assets, the conceptual goal of stewardship reporting is to provide information on how management has discharged these responsibilities. The extant literature has generally analyzed stewardship and stewardship reporting in the context of agency theory.

Sunder and Yamaji (1999) suggest that stewardship reporting was initially established to satisfy owners' information needs upon separation of ownership and control. With managers acting on behalf of owners, a moral hazard problem emerges where the manager may act in self-interest. Further, since managers have private information on their chosen actions, they may prevent the owner's awareness of any self-interested action (i.e. manager-owner information asymmetry). Consequently, the goal of stewardship reporting is to establish a link between managerial action and company results. Gjesdal (1981) defines stewardship demand as "a demand for information about the actions that are taken [by management] for the purpose of controlling them" (p. 208), which frames stewardship in the context of agency. More specifically, proper financial reporting of stewardship provides incentives to and controls on management to minimize moral hazard. Overall, stewardship reporting involves obtaining information for the purpose of controlling management action through decisions such as retaining or replacing management or designing compensation contracts to align manager and shareholder incentives.

The extant literature focuses on compensation contracting when assessing stewardship. In fact, a number of papers treat stewardship and incentive contracting as synonymous (e.g. Bushman, Engel and Smith (hereafter BES) (2006)). Lambert (2001) uses stewardship purposes and managerial incentive purposes interchangeably. Bushman and Indjejikian (1993) suggest that stewardship reporting is necessary as a managerial performance measure and by extension is necessary for the incentive contracting of management. This consistency in the literature stems from the fit of stewardship to an agency framework that emphasizes compensation contracting to minimize moral hazard.

Stewardship demand for information stems from the separation of ownership and control, with the principals requiring periodic reporting to assess management's stewardship. Further, compensation contracting provides a means of motivating management's positive stewardship and thus minimizing agency problems. The terms stewardship, incentive contracting, and contracting usefulness are often used interchangeably in the literature. For my dissertation, a key goal is to inform standard setters whether FVs provide useful stewardship information. Since I am aware of no objective measure of stewardship to test association with FVs, I must infer stewardship from decisions that are based on stewardship information, which primarily involves compensating management and retaining or replacing management. These decisions are consistent with theoretical and empirical work that frames stewardship in an agency context, allowing me to achieve my goal of informing standard setters, while providing a framework for my analysis.

2.2.3 Stewardship versus Valuation

In this section, I first describe support for the importance of stewardship as a separate financial reporting objective by considering the recent FASB/IASB Conceptual Framework project. Next, since many existing papers have studied how FV serves valuation, I discuss research and analysis on the difference between information serving stewardship versus the valuation objective of financial reporting.

Historically, two objectives of financial reporting dominate: (1) valuation (i.e. cash flow prediction); and (2) stewardship. The valuation objective of financial reporting is generally described as providing information that is relevant for predicting the amount, timing and uncertainty of cash flows for the purpose of valuing a company's securities (see FASB/IASB Conceptual Framework exposure draft, paragraphs OB6 and OB10). Stewardship has been described in the previous section. The FASB/IASB Conceptual Framework preliminary views (July 2006) challenged the existence of two distinct objectives and suggested stewardship decisions are secondary to investment decisions, and information serving valuation must naturally address stewardship needs.

The preliminary views met with significant disagreement; notably, two IASB board members believed that stewardship should be a separate financial reporting objective rather than a subset of decision-usefulness that emphasizes investment decisions and cash flow prediction (FASB/IASB Conceptual Framework preliminary views, Appendix B). Furthermore, 86% of the 179 comment letters on the preliminary views disagreed with the minimization of the stewardship objective (FASB/IASB Board meeting handout, February 28, 2007).

In response, the FASB/IASB issued the Conceptual Framework exposure draft in May 2008 with a more general financial reporting objective of decision-usefulness to capital providers. Since decision-useful information is not specific in guiding policy, the FASB/IASB elaborate by defining two categories: (1) usefulness of financial reporting in assessing cash flow prospects (i.e. valuation); and (2) usefulness of financial reporting in assessing stewardship. The FASB/IASB does not state the primacy of either cash flow prediction or stewardship, thus providing no basis for making an accounting choice that may serve one objective to the detriment of the other. Implicitly, the FASB/IASB assumes there is no conflict between the two objectives. However, Lambert (2001) states "the way information is aggregated for valuation purposes is not the same way this information would be aggregated for compensation purposes" (p. 42). The FASB/IASB's belief of no conflict has received limited theoretical and empirical attention by academic researchers, especially considering the support given to the importance of stewardship in financial reporting.

Gsejdal (1981) theoretically demonstrates that the criteria for stewardship-usefulness and valuation-usefulness are different, even though the concepts are related. Further, from an empirical perspective, BES (2006) explore the role of accounting information in serving the valuation versus the stewardship financial reporting objectives. They correlate the sensitivity of firm value to earnings to the sensitivity of stewardship, as measured by CEO cash compensation, to earnings for a given firm or industry. They find Pearson correlations for firm (industry) analysis of 34% (60%), suggesting that when accounting earnings are useful for valuation, they are also useful for stewardship and vice versa; however, no complete overlap exists on average. Consequently, information relevant for valuation may or may not be useful for stewardship and vice versa. BES (2006) find in the later sub-period (1986-2000), compensation increasingly uses other information outside of earnings, where stock returns proxy for 'other information'. Thus, opportunity exists for exploring precisely what is contained in 'other information'. Since FVs are reflected in firm valuation through stock returns (discussed in the next section), the increasing use of other information may reflect the increasing importance of FVs for stewardship, which I consider in my testing of **H1** in Section 6.2.

Logically, valuation and stewardship information overlap; information for investors that illustrates management's stewardship also impacts investors' perceptions of company value. BES (2006) find a firm-level correlation of only 34%, suggesting the majority of information serves only valuation or stewardship. Consequently, FV information may be useful for one purpose, both purposes, or may impact each purpose in a different way.

Stewardship and valuation differ in a number of ways: First, stewardship is primarily a past concept; standard setters discuss how providers of capital are interested in assessing how effectively management *has* fulfilled this role. In contrast, valuation is primarily a future concept; standard setters describe how stakeholders are interested in predicting future cash flows to assess the value of a company. Thus, useful stewardship information demonstrates how management has discharged their responsibilities, while useful valuation information demonstrates what cash flows a firm will generate. Information will overlap to the extent that past performance captures both historical stewardship and cash flow prediction. Second, stewardship information ideally captures the performance of management independent from the performance of the firm. While firm and management performance will be related, firm performance may be affected by decisions of past management or by uncontrollable external events. Meanwhile, valuation is only concerned with future cash flow regardless of whether that cash flow stems from management or firm performance. Third, actions raising concerns about management integrity are quite significant for stewardship purposes since a trust has been broken, but may have little impact on firm valuation. For example, a CEO using company resources for a spouse's birthday party that cost £30,000 is clearly demonstrative of poor stewardship, while valuation is only concerned with the impact on future cash flow, which is likely insignificant to the firm. Overall, stewardship and valuation information overlap; however, the overlap of information will never be complete. Kothari, Ramanna and Skinner (2010) argue that only if earnings follow a random walk and the market has no information beyond the time series of earnings would stewardship and valuation information needs coincide completely.

2.3 Fair Value Accounting

In this section, I briefly summarize the extant FV research. From the previous section, I believe that information serving valuation may not necessarily serve stewardship. Consequently, the extensive work done on the value relevance of FVs informs my study, but is not conclusive for stewardship-usefulness of FVs. FV accounting continues to gain momentum around the world with global adoption of IFRS; however, little attention has been given to the relationship between FVs and stewardship. Landsman (2007) summarizes FV research by suggesting support in the literature for investors finding FVs incrementally informative for firm valuation; however, that informativeness is negatively impacted by estimate reliability.[5] I now discuss this broad conclusion in more detail.

Many accounting standard setters are moving towards increasing use of FV accounting. For example, the FASB introduced SFAS 159, "The Fair Value Option for Financial Assets and Financial Liabilities", and SFAS 157, "Fair Value Measurements". Further, the proposed FASB/IASB Conceptual Framework prominently features balance-sheet-focused financial reporting consistent with FV accounting and minimizes the importance of earnings measurement. Many jurisdictions, notably the European Union, have indirectly moved towards FV accounting by adopting IFRS, which uses FVs to a greater extent than most existing national standards. For example, IFRS contains FV options for property, plant and equipment under IAS 16; certain intangible assets under IAS 38, "Intangible Assets"; investment properties under IAS 40; and biological assets under IAS 41, "Agriculture". FV is also required for most financial assets and liabilities under IAS 39, "Financial Instruments: Recognition and Measurement", and impaired tangible and intangible assets under IAS 36, "Impairment of Assets". Many national standards, notably Canada and the US, do not allow recording property, plant and equipment; intangible assets; investment properties; and biological assets at FV.

[5] See Barth (2007) for an additional summary of FV research.

FV accounting has many advocates and critics. Advocates such as Mary Barth argue that FVs provide the most relevant financial reporting (Barth 2007, p. 12), while critics such as Ray Ball argue that FVs lack reliability (Ball 2008). Most existing FV research focuses on Level 1 FVs with independent open market values.[6] Specifically, Barth (1994) finds balance sheet FVs of securities are more value relevant than HCs, when FVs are disclosed with HCs recognized. Some research has moved beyond Level 1 FVs to find value relevance for loans and core deposits (Barth, Beaver and Landsman 1996), derivatives (Venkatachalam 1996), pensions (Landsman 1986), and stock options (Aboody, Barth and Kasznik 2004).

In addition, academic research explores revaluations of long-lived assets, which would generally be considered Level 2 or 3 FV estimates. Specifically, Barth and Clinch (1998) find revaluations of financial assets and intangible assets are value relevant; however, they find mixed evidence supporting the value relevance of property, plant and equipment revaluations. Easton, Eddy and Harris (1993) find that revaluations of property, investments, plant and equipment, and intangibles help to explain the difference between book and market value. Furthermore, Aboody, Barth and Kasznik (1999) find that upward revaluations of property, plant and equipment are both value relevant to investors and related to future operating performance improvements. In each above study, property, plant and equipment represent firm operating assets. More recently, Kolev (2009) finds Level 3 FV estimates are adequately reliable to be reflected in stock prices, but such estimates are reflected to a lesser extent compared to Level 1 estimates.

[6] SFAS 157 provides three levels of FV measurements: Level 1, which is a quoted price in an active market; Level 2, which represents a FV with no active market, but has observable inputs on which to base an estimate; and Level 3, whose estimates have neither an active market nor observable inputs. Level 1 represents FVs that have readily available open market values such as exchange-listed stocks or bonds. Level 2 FVs include quoted prices for similar assets and liabilities, and estimates such as an illiquid municipal bond that has a credit rating that can be used to value the bond using comparable yields. Level 3 FVs represent situations where a pricing model must be developed and assumptions made by management to determine inputs that are relevant to that pricing model. For example, the valuation of a patent held by an investor would generally be considered Level 3, since a valuation model needs to be developed to estimate its FV.

Limited research empirically explores situations where FV estimates may not be reliable; however, Barth, Beaver and Landsman (1996) find investors appear to discount the FVs of loans for less financially stable banks, suggesting that investors recognize FV estimates that are more likely to be biased. Aboody, Barth and Kasznik (1999) find that upward revaluations are related to future changes in a firm's performance, suggesting that the revaluations are warranted; however, firms with high leverage experience a weaker relationship between revaluations and future operating performance, suggesting management bias may be influencing FV estimates. In contrast, Bernard, Merton and Palepu (1995) find that managers of Danish banks do not bias FV estimates to meet regulatory capital constraints.

Several studies have investigated the impact of firms using independent appraisals on the reliability of FV estimates relative to firms using internally-prepared appraisals. Barth and Clinch (1998) find independent appraisals have no impact on the relevance of FVs to investors for property, plant and equipment for Australian firms relative to internal appraisals, while Cotter and Richardson (2002) find external appraisals, relative to internal appraisals, are more reliable for plant and equipment, but not for land, buildings, and intangibles.[7] Muller and Riedl (2002) find the use of external appraisals for investment properties in the UK reduces information asymmetry (i.e. bid-ask spreads).

In summary, FVs are generally value relevant, but can be subject to management bias and reliability concerns. External appraisals improve estimate credibility is some circumstances. In the next section, I bring together the research on FV accounting and stewardship.

2.4 The Stewardship-Relevance of Fair Values

FVs reflect on a more-timely basis the results of management's decisions. Since FVs reflect management effort on a more-timely basis than HCs, I expect FVs provide information incremental to HCs in assessing

[7] Cotter and Richardson (2002) measure reliability as the extent to which upward revaluations are not reversed in the future.

management's stewardship. Whittington (2008) supports this notion when he suggests that more timely information may be more useful for controlling the actions of management. FVs can provide more timely information when changes are negative as well as positive; in my sample, 85 firm-years have negative revaluations, but only 35 firm-years have impairment write-downs, which suggests many firms view FV declines as temporary. This finding is consistent with Hilton and O'Brien (2009), who found that INCO delayed recording an impairment loss for several years beyond when the FV had declined.

Holmstrom's (1979) informativeness principle states that a noisy signal measuring management action with error should still be used in the compensation contract ("any informative signal, regardless of how noisy it is, will have positive value" (p. 87)). In the context of FVs, even if a FV estimate contains significant bias and error, it will still contain some indication of management effort, and thus should be used for stewardship purposes in addition to other measures providing signals of management effort. However, from Banker and Datar (1989), a signal that is not very sensitive to management action and that is noisy (defined as having high variance reflecting the influence of other factors) should receive little weight relative to more sensitive, less noisy signals, suggesting the possibility that FV changes could be useful for compensation contracting, but receive such a low weighting as to be insignificant.

Bushman and Smith (2001) find that stock returns are rarely used explicitly in the cash component of CEOs' compensation contracts. Nevertheless, stock returns are typically correlated with cash compensation, suggesting that stock returns are acting as a proxy for other performance measures used for compensation contracting. From the FV literature (for example, see Barth 1994; Danbolt and Rees 2008), stock prices are correlated more strongly with FVs than HCs, thus the observed stock price relation with CEO compensation may be partially due to the reflection of FVs. If true, FVs may represent a direct performance measure that is indirectly captured through stock returns.

From the opposing viewpoint, critics of FVs often focus on the reliability of FV estimates. FV estimates do not represent realized transactions, thus no truly objective basis for FV estimates exists. Further, management may bias estimates to achieve desired outcomes since FV estimates require judgment. For example, Ramanna and Watts (2009) find that managers opportunistically record difficult-to-verify goodwill impairments. Further, Gjsedal (1981) claims that stewardship information must be "hard" (p. 218). More specifically, Ijiri (1983) suggests that information must be objective and verifiable to be useful for stewardship. According to Ijiri, objectivity means that the information is independent of the preparer, while verifiability means that the information can be traced back to support at a later date. Ijiri (1975) states that a proper accounting system for stewardship must understand any potential bias in the information, with the goal of producing "unbiasable" information. FV estimates cannot be unbiasable due to inherent subjectivity; consequently, Ijiri would suggest FVs are unsuitable for stewardship. The American Accounting Association's Financial Accounting Standards Committee (2007) refers to FVs as "soft" (p. 230), which forces the question of whether FVs are developed based on adequate support to be used for stewardship purposes. Further, as FVs become more uncertain, investors assign a increasingly lower valuation weight (Magnan and Thornton 2010), which suggests that only the most certain FVs will be stewardship-relevant due to the higher requirement for information hardness. In addition, FVs are generally calculated as market value, not entity-specific value, which Whittington (2008) believes are necessary for stewardship. Finally, FVs may inform valuation, but since stewardship is not a subset of valuation (although they are related), FVs may or may not be useful for stewardship purposes.

Overall, notwithstanding hardness concerns, FV estimates provide management performance information on a more-timely basis than HCs. Further, FVs provide an on-going stream of information about asset values, while HCs only provide information upon purchase and sale. Finally, anecdotal evidence suggests compensation committees consider FVs adequately reliable for compensation contracting; for example, Eskmuir's 1999 annual report states "The bonus is based upon the increase in the company's net asset value (pg. 11)". Based on the above analysis, I predict that FVs provide incremental information useful for assessing management's stewardship, leading to the following hypothesis (stated in alternative form):

H1: Fair values provide information incremental to historical costs that is useful for assessing management stewardship.

2.5 The Impact of Objectivity and Verifiability on Stewardship-Relevance of Fair Values

By their nature, all accounting estimates allow the potential for management bias in estimation; however, various mechanisms such as external appraisals may provide adequate objectivity and verifiability to allow use of FVs for stewardship. Increasing objectivity and verifiability of FV estimates reduces management subjectivity in estimation since those estimates would be reached by independent observers. Typically, objectivity, verifiability and subjectivity move in complementary ways; for example, external appraisals reduce management subjectivity due to reduced estimation input, while improving objectivity since formal valuation guidelines are used, and verifiability since external appraisers prepare valuation reports. In this paper, I presume that increased subjectivity results in decreased objectivity and verifiability and vice versa.

According to Ijiri (1983), information must be objective and verifiable to be used for stewardship purposes since the overall goal is to provide a "fair system of information flow" (Ijiri 1983, p. 75). Objective and verifiable information is independent of subjective bias of the information's preparer. Often criticized for being subjective, fair values inherently allow subjectivity in estimation since no purely objective source exists (e.g. a sale price); however, fair values vary in objectivity and verifiability.

For the following set of hypotheses, I consider influences generally believed to both reduce subjectivity in preparation of the estimate and improve objectivity and verifiability, thus testing Ijiri's assertion.

Further, Lambert and Larcker (1987) and Banker and Dater (1989) explore performance measures' signal-to-noise ratios; specifically, they find that a noisy signal of management effort should be weighted less heavily for compensation contracting. Even though the authors refer to relative signal-to-noise ratios for multiple performance measures, I apply the concept to relative signal-to-noise ratios between firms, rather than multiple performance measures within a single firm; a higher quality signal in one firm should be weighted heavier than a noisier signal in another firm. The concept of signal-to-noise ratio and increasing objectivity and verifiability are related; presumably, if objectivity and verifiability are increased, noise is decreased and vice versa. Nevertheless, the concepts are not identical, since noise is generally neutral, while subjectivity in estimation may err consistently in one direction.

External appraisals provide both objectivity and verifiability since they estimate fair value largely independent of management. While management may exert influence over external appraisers, such influence will be less than the absolute control they have over their own actions. Muller and Reidl (2002) find external appraisals of real estate assets increase investors' perceptions of the reliability of those FVs, resulting in lower costs of equity. Further, Dietrich, Harris and Muller (2001) find external appraisals result in less biased FV estimates. Based on the above, I expect that external appraisals will increase the objectivity and verifiability of FV estimates, thus increasing usefulness for assessing management's stewardship, leading to the following hypothesis (stated in alternative form):

> **H2a:** ***Externally appraised*** **fair values provide** ***more*** **incremental information beyond historical costs for assessing management stewardship than internally appraised fair values.**

While Muller and Reidl (2002) find that using Big N auditors does not affect investor-perceived reliability of FVs, Dietrich, Harris and Muller (2001) find that using Big 6 auditors does reduce the bias in FV estimates.[8] Arguably, Big N auditors have larger resources to allow more sophisticated consideration of FV estimates and greater power to stand firm when faced with management pressure to approve FV estimates. Further, Big N auditors lend greater credibility to the audited information (Teoh and Wong 1993). Finally, Francis (2004) summarizes work performed on Big N auditors to suggest that Big N audits are of higher quality that result in lesser information asymmetry and better financial information. Based on the above, I expect that Big N auditors will decrease the subjectivity in management estimates of FV, leading to the following hypothesis (stated in alterative form):

H2b: *Big N audited* fair values provide *more* incremental information beyond historical costs for assessing management stewardship than non-Big N audited fair values.

BODs directly oversee managements' actions, providing the opportunity to reduce subjectivity in management estimates. The reduced subjectivity may be accomplished directly through additional scrutiny or indirectly by requiring an external appraisal. Director scrutiny may require management to improve justification of estimated FVs, leading to greater objectivity and verifiability. Further, a strong BOD may provide a deterrent to managers to avoid biased estimates due to a greater probability that such a manipulation would be caught. Strong governance can be applied in a number of ways that I explore in detail in Section 7.2.7 and 7.2.8 by dividing into governance into 'oversight', 'CEO power', and 'estimate quality'.

[8] I use the term Big N auditor since the number of large audit firm changes over my sample period from Big 6 (Ernst & Young, KPMG, Price Waterhouse, Coopers & Lybrand, Arthur Andersen, and Deloitte & Touche) to Big 5 in 1998 when Price Waterhouse and Coopers & Lybrand merged, and to Big 4 in 2002 when Arthur Andersen collapsed.

Certain BOD characteristics are linked to stronger monitoring of management; Fama (1980) and Weisbach (1988) find that BOD monitoring is more effective when the BOD contains independent directors. Further, Jensen (1993) suggests that BOD monitoring is weaker when the CEO is also the chairman of the BOD. Both Jensen (1993) and Yermack (1996) suggest smaller BODs are more effective in monitoring management. Finally, CEOs serving on compensation committees indicates weak governance; for example, Collins, Gong, and Li (2009) find CEOs having more influence over compensation committees are more likely to backdate stock options. Based on the above, I expect that a stronger BOD reduces the subjectivity in management's FV estimates, making those estimates more useful for assessing stewardship, leading to the following hypothesis (stated in alterative form):

H2c: When managers are *strongly governed*, fair values provide *more* incremental information beyond historical costs for assessing management stewardship than when managers are weakly governed.

Finally, management has the opportunity to bias FV estimates to pursue an agenda that may be self-serving. For example, if CEOs bonuses are based on net assets, they may bias their FV estimates upwards to obtain their bonus. Further, external appraisals do not eliminate the potential for management bias; CEOs may be able to influence external appraisers since CEOs may choose the appraisers. Biased estimates are by definition subjective and thus lack objectivity (i.e. since the estimate is not independent of the preparer). Biased estimates are similar in nature to managed earnings, which are generally found to be less rewarded by stock holders (for example, see Marquardt and Wiedman 2004). Thus, biased estimates are expected to be less useful for assessing management's stewardship, leading to the following hypothesis (stated in alterative form):

H2d: ***Less biased* fair values provide *more* incremental information beyond historical costs for assessing management stewardship than more biased fair values.**

2.6 The Impact of Sensitivity to Management Effort on Stewardship-Relevance of Fair Values

Using theoretical modeling, Lambert and Larcker (1987), and Banker and Datar (1989) show that performance measure usage in compensation should be increasing in that measure's sensitivity to management effort. Since compensation contracts are designed to evoke management effort, rewarding management on measures over which they have no control is ineffective. Thus as sensitivity to management effort increases, I expect that FVs will provide more useful information is assessing management's stewardship, leading to the following hypothesis (stated in alterative form):

H3: **When *more sensitive* to management effort, fair values provide *more* incremental information beyond historical costs for assessing management stewardship than when fair values are less sensitive to management effort.**

2.7 The Impact of Variance on Stewardship-Relevance of Fair Values

Lambert and Larcker (1987) find the weight placed on a given measure for compensation is decreasing in its relative variance, which is consistent with theoretical prediction. By extension, with all else equal, firms having a higher variance in their FVs should place a lesser weight on those FVs for compensation or stewardship purposes, leading to the following hypothesis (stated in alterative form):

H4: ***Less variant* fair values provide *more* incremental information beyond historical costs for assessing management stewardship than more variant fair values.**

2.8 The Impact of Persistence on Stewardship-Relevance of Fair Values

Using data for US CEOs, Baber, Kang and Kumar (1998) find the use of earnings for compensation is increasing in the persistence of those earnings, consistent with the notion that management should be rewarded for earnings innovations that are permanent. Further, from the literature studying earnings properties and valuation, persistent earnings innovations receive larger stock market reaction. In contrast, using a theoretical model, Christensen, Feltham and Sabac (2005) predict that higher earnings persistence makes earnings less useful for compensation contracting due to increased risk borne by management. Based on the underlying intuition and empirical results of Baber, Kang and Kumar's study, I predict FVs will provide more useful information to assess management's stewardship when they are more persistent, leading to the following hypothesis (stated in alterative form):

H5: ***More persistent*** **fair values provide** ***more*** **incremental information beyond historical costs for assessing management stewardship than less persistent fair values.**

Chapter 3
Background for UK Real Estate Firms

3.1 Accounting for Investment Properties

Accounting for investment properties varies significantly among global accounting standards. US and Canadian standards require the use of depreciated cost with impairment testing, while IFRS provides the option of FV accounting or depreciated cost accounting with disclosure of FVs, while UK GAAP required the use of FVs with the disclosure of HCs. In this section, I provide the necessary detail for UK GAAP to understand my empirical tests. In addition, I provide a comparison to Canadian , US GAAP, and IFRS.

In the UK, accounting for investment properties prior to IFRS was governed by Statement of Standard Accounting Practice (SSAP) 19, "Accounting for Investment Properties", issued by the Institute of Chartered Accountants in England & Wales (SSAP 19), which was issued in November 1981 and applies to all firms. Under SSAP 19, investment properties are considered as distinctive fixed assets since they are "held not for consumption in the business operations but as investments" (SSAP 19, p. 4). Consequently, investment properties are carried at "open market value" (SSAP 19, p. 4). No detailed guidance is contained in SSAP 19 to define open market value. No depreciation is taken on investment properties under SSAP 19, which supersedes the Companies Act 1985 requiring all properties to be depreciated. SSAP 19 largely includes parallel FV and HC accounting systems, since investment property HCs must be disclosed. Disclosed HCs differ from FVs only with respect to annual revaluations (i.e. no depreciation is taken on disclosed HCs). Further, initial purchase costs are recorded in the same manner for both FVs and HCs.

Revaluations from past years realized upon final sale are prominently displayed in a supplementary financial statement typically entitled "Note of historical cost profits and losses". This parallel system provides an excellent opportunity for comparison of FV and HC accounting. Revaluations of investment properties are recorded in an investment revaluation reserve, a component of shareholders' equity, and recorded in a separate financial statement, entitled "Statement of total recognized gains and losses". Thus, while revaluations are not recognized in the income statement itself, they are prominently displayed in a financial statement, reducing concerns of perceived differences due to disclosure versus recognition of FVs. Revaluations that are considered permanent impairments to the value of investment properties are recorded as a loss in the income statement in the year of the write-down. Permanent revaluations reduce both the FV and HC of investment properties (i.e. the disclosed HC of investment properties is also reduced). In the year of sale, any gain or loss relative to the beginning-of-year FV is recognized in the income statement, but prior years' revaluations move directly from the revaluation reserve to retained earnings. Disclosure of the carrying value (i.e. HC) is required. Firms are required to obtain external appraisals of investment properties at least every five years when investment properties represent a substantial portion of total assets.

In Figure 1, I demonstrate several examples of accounting for investment properties under SSAP 19 with linking to regression variables. In Example 1, an investment property is purchased for £10 million in 1998 and sold for £13 million in 2001. In this case, annual FV changes affect the balance sheet values since investment properties are carried at FV, but HC is not affected. In 2001, upon sale, the previous FV changes are realized under HC accounting, demonstrating that total FV and HC gains/losses are the same over an asset's life, but are recognized sooner under FV accounting. In Example 2, an investment property is purchased for £25 million in 2000 and sold for £18 million in 2003. Permanent impairments in value reduce both FV and HC, while negative revaluations (i.e. decreases in value considered non-permanent) reduce the carrying value under FV accounting below the carrying value under HC accounting. In 2003, upon sale, the previous FV losses are realized under HC accounting.

In Canada, investment properties do not have a separate accounting standard and are governed by CICA 3061, "Property, Plant and Equipment". Under CICA 3061, investment properties are initially recognized at cost, with depreciation recorded in a systematic and rational manner over the property's useful life. Further, under CICA 3063, "Impairment of Long-lived Assets", an investment property is written down to FV whenever the carrying amount is not recoverable (i.e. the carrying value of the asset exceeds the future cash flows expected to be generated from that asset), but assets are never written back up to original cost. Similarly, the US does not have a separate accounting standard; investment properties are recorded at depreciated cost under Accounting Principles Board No. 6, with annual consideration of whether the investment properties are impaired.

Under IFRS, accounting for investment properties is governed by IAS 40. IAS 40 allows firms to choose either a FV model or a cost model. The FV model requires the use of FV with valuation changes from one balance sheet date to the next recognized in the income statement; no depreciation is recorded when using the FV model. The cost model requires investment properties to be recorded at depreciated cost, in accordance with IAS 16. If the cost model is chosen, firms must disclose the FVs of investment properties. Regardless of the chosen model, initial recognition of investment properties is cost. If FV of a specific property cannot be determined reliably, then value is determined as cost for that property.

Only UK accounting for investment properties prior to IFRS provides the opportunity to test whether FVs provide incremental information over HCs. Current Canadian and US GAAP do not require FVs for investment properties, leaving only HC information. Further, IFRS provides only FV information if the FV model is elected, meaning HC information is not available. If HC is elected under IFRS, FVs must be disclosed, which gives poor prominence to FVs and could be interpreted to be less reliable. Further, firms may opportunistically self-select into HC or FV models. Based on Muller, Riedl and Selhorn (2008), most real estate firms opt for the FV model post-IFRS, meaning that HC will not available for most firms. Overall, only pre-IFRS UK real estate firms allow comprehensive comparison of FVs and HCs.

When investment properties are sold, only the gain/loss component is recorded as revenue. Consequently, revenue for firms that develop or acquire properties for the purpose of future sales will appear low relative to many traditional firms. Further, since revaluations from prior years move directly to retained earnings, gains/losses on investment property sales are generally small. Rental income makes up the largest component of total revenue at 81.7% on average.

Investment properties are recorded at FV, including revaluations above or below original cost. Under many national GAAPs (e.g. Canada), a future income tax liability (asset) is recorded if tax base of an asset is less than (exceeds) its carrying value. For most firms in my sample, the carrying value (i.e. FV) of investment properties exceeds tax base (i.e. cost), which would typically result in a future income tax liability. Under UK GAAP, however, real estate firms choose not to record future income tax for investment property revaluations, resulting in FVs that do not reflect the actual cash to be received upon eventual sale. For example, Brixton PLC's 1996 annual report states "As all the Group's investment properties are held as long term investments, no provision is made for the tax which would arise if they were sold at their book values at the balance sheet date" (p. 28). As a consequence of the above tax treatment, average firm market value is less than average book value of equity for my sample.

3.2 Components of Compensation

As noted by Conyon and Murphy (2000), compensation practices in the UK differ significantly from the US. They find CEOs in the UK are paid much less than in the US, with an average of £660,000 versus £6.3 million for the largest 500 companies in each country in 1997. Further UK firms use stock-based compensation to a much lesser extent, with stock and option grants comprising only 19% of total compensation in the UK versus 46% for the US.

In Table 1, I detail the components of compensation for my sample of firms. From Panel A, I observe salary and bonus represent the most significant components of total compensation at 54.8% and 24.9% respectively. I find stock-based compensation is not used to a large extent in my sample, with LTIP shares and stock options representing 7.4% and 6.4% of total compensation respectively. The comparable figures for Conyon and Murphy (2000) are 9% and 10% for LTIP shares and stock options respectively. LTIP stock is only granted in 15.5% of firm-years (69 / 445) and stock options are granted in 33.3% of firm-years (148 / 445). Total compensation averages £418,050, which is lower than Conyon and Murphy's average of £660,000; however, my firms are much smaller on average with an average market capitalization of £398 million versus £2.2 billion for Conyon and Murphy.

In Panel 3, I tabulate average compensation using three definitions of compensation: (1) cash compensation; (2) total cash compensation; and (3) total compensation. Cash compensation, which includes salary, bonus, and other (i.e. benefits), averages £349,308 or 83.6% of total compensation. Total cash compensation, which further includes cash LTIPs, averages £359,863 or 86.1% of total compensation. Total compensation, which further includes stock LTIPs and stock options, averages £418,050. I use cash compensation for the bulk of my analysis since I believe cash compensation best captures the notion of stewardship (as discussed in Section 4.1); however, cash compensation also captures the large majority of total compensation.

Many LTIPs in the UK require performance benchmarks to be achieved before LTIP shares are released. In the US, LTIP shares may vest over time, but do not typically require the achievement of performance benchmarks to be released (Conyon and Murphy 2000). In my sample, of the 69 LTIP share grants, 56 (81.1%) are contingent on achieving future performance targets. Consistent with Conyon and Murphy, I discount the value of performance-contingent LTIP shares by 20%.

I measure the value of stock options using the Black and Scholes (1973) formula, adjusted for continuously paid dividends. Since many firms do not disclose grant dates, I assume all options are granted mid-year; option values assuming end-of-year grant dates are correlated 97.6%. Further, I assume all options have a ten-year life, based on my review of option grants in my sample. I obtain firm-year specific dividend yields from Datastream. Daily stock volatilities are also obtained from Datastream; stock price volatility is calculated using the 120 trading days prior to the grant date. I assume exercise price equals grant date price for all grants, which holds true based on my review of option grants in my sample. Risk-free rates are based on 10-year UK treasury bills.

3.3 External Appraisers

Under SSAP 19, annual valuations of investment properties are required when "investment properties represent a substantial proportion of the total assets of a major enterprise (e.g. a listed company)" (p. 4). Such annual revaluations must be completed by a professionally-qualified person having experience with the similar properties. The annual valuations may be completed by external appraisers or internal experts; however, an external appraiser is required at least every five years.

Professionally-qualified persons are typically Chartered Surveyors who are registered with the Royal Institution of Chartered Surveyors (RICS), an organization founded in the UK that has approximately 100,000 members world-wide. Further, both internal and external valuations are completed in accordance with RICS Appraisal and Valuation Standards, often referred to as the 'Red Book'. These standards are quite comprehensive and include standards on knowledge and skills, independence, objectivity, conflicts of interest, and confidentiality, among other standards covering how the work is to be done. The 5th edition of the Red Book states "the objective of these Standards is to ensure that valuations produced by members achieve high standards of integrity, clarity and objectivity, and are reported in accordance with recognized bases that are appropriate for the purpose" (p.2). Overall, the Red Book provides rigorous professional standards designed to ensure valuation quality.

Chapter 4
Research Design

4.1 Introduction

To measure the impact of fair values on stewardship, I focus on management's primary stewardship responsibility to current shareholders. While management's stewardship responsibilities typically apply to other user groups, including debt holders, creditors, customers, employees, government, and the public, standard setters generally suggest that current shareholders are a particularly important user group. For example, the FASB/IASB Conceptual Framework exposure draft suggests "Management's performance in discharging its responsibilities, often referred to as stewardship responsibilities, is particularly important to existing equity investors" (paragraph OB12). In addition, in the stewardship literature, primacy is given to the management/owner relationship (e.g. Birnberg 1980). Finally, the stewardship literature provides limited guidance to frame and assess management stewardship in a context other than shareholders and owners.

Current shareholders use stewardship information for multiple purposes. For shareholders, the primary purpose of stewardship information is to assess how well management has controlled entrusted assets. More specifically, shareholders are interested in whether management has appropriately safeguarded those assets and whether management has effectively and efficiently used those assets to generate shareholder value. In the real estate context, good stewardship primarily means making sound property acquisition, development, rental, and financing decisions, but also includes keeping operating costs low, avoiding inappropriate rent-extracting transactions, safeguarding assets through effective control systems, and preparing unbiased reporting. Overall, managers must appropriately balance taking on risk with the potential associated rewards.

With information regarding how management has discharged its stewardship responsibilities, shareholders will primarily make the following decisions: (1) whether to sell or continue holding company stock; (2) whether to replace or retain the current management; and (3) how to compensate management. For decision (1), shareholders will consider management's stewardship in combination with numerous other factors including: (a) economic prospects for the company's industry independent of management; and (b) the fit of the current investment in the shareholder's portfolio. Consequently, when assessing shareholders' decisions to hold versus sell the company's stock, it is difficult to isolate the specific impact of stewardship in that decision.

For decision (2), whether to retain or fire current management, information on management's stewardship has a significant impact. If management has been a good (poor) steward of the company's assets, management is more (less) likely to be retained. From a practical perspective, I observe only the dichotomous decision of retaining or replacing management, which occurs infrequently in my sample. Nevertheless, I use the existing 38 CEO changes in the sample for additional analysis using a different measure of stewardship.[9] See section 7.2.3 for analysis of CEO changes. Since I have annual observations and thus significantly greater testing power, I focus my testing efforts on decision (3).

For decision (3), how to compensate management, management's stewardship has a significant impact. First, compensation contracts are designed to minimize the agency conflict between managers and shareholders. Further, compensation contracts are designed to reward managers for achieving desired objectives. However, corporate BODs must be sophisticated in the design and application of compensation contracts in order for the change in CEO compensation to be meaningful. BODs, often through compensation committees, generally reward CEO's for good performance and punish them for poor performance. CEO pay reflects performance, where CEO performance is measured through stock

[9] I have 38 CEO changes, rather than 36 as noted in Table 1 due to not needing detailed compensation data for testing of CEO changes.

returns (Lambert and Larcker 1987, Jensen and Murphy 1990, and Yermack 1996) and through accounting earnings (Lambert and Larcker 1987, and Gaver and Gaver 1998). Further, Dechow, Huson and Sloan (1994) find that BODs alter compensation contracts to minimize CEO actions that are detrimental to the company's long-term health. Overall, the compensation literature generally demonstrates a strong and consistent pay for performance relationship.

Nevertheless, anecdotal evidence in the popular press may suggest that BODs give in to CEO pressure.[10] In an analytical paper, Bebchuk, Fried and Walker (2002) suggest that managers have the power to influence their own pay arrangements; however, Edmans and Gabaix (2009) suggest alternative theoretical explanations that are consistent with efficient contracting. Further, Gaver and Gaver (1998) find asymmetry in the sensitivity of CEO cash compensation to accounting earnings. Specifically, they find that CEO cash compensation is sensitive to profits and one-time items that increase profits, but not to losses and one-time items that decrease profits. Adut, Cready and Lopez (2003) support Gaver and Gaver's (1998) findings, but note that CEO's are not completely protected from one-time losses unless the CEO is long-tenured and the one-time loss is unusual. Thus, CEOs are generally rewarded for strong performance, but the literature does document some inconsistencies. Even though CEOs may be shielded from losses to a certain extent by compensation committees, most values in my sample for annual revaluations and HC gains and losses realized on actual sale are greater than or equal to zero for 80.9% and 86.1% of observations respectively. Consequently, my sample still provides the opportunity to test compensation value of revaluations and HC gains/losses.

From the above analysis, compensation contracting provides an opportunity to measure shareholder use of stewardship information. Further, the use of compensation contracting for measuring stewardship has strong support in the extant literature. Since many (e.g. Gsejdal) believe that stewardship reporting serves

[10] For example, see "'Over-the-top' CEO compensation leaves investors in the cold", Kai Li, The Globe and Mail, June 2, 2008.

the purpose of controlling the actions of management to minimize moral hazard, measuring the impact of stewardship through compensation contracting has theoretical support. I recognize other mechanisms exist to minimize agency conflicts, such as a strong audit function over management reporting; however, I focus on compensation contracting as a means of minimizing the manager-shareholder agency conflict since shareholders represent the primary group and compensation contracting is observable in detail.

Measuring stewardship using management compensation has several notable advantages over using changes in firm valuation to infer management stewardship. First, stewardship is primarily a past-oriented concept, while firm values reflect future cash flows. As a consequence, firm values reflect the impact of past management action as well as actions that management is believed to undertake in the future. For example, if a strong CEO has a strong track record of success with introducing new products, the stock price will incorporate presumed new product launches that may not yet be conceived, which means that stock price captures not only past but future management stewardship. Thus, the use of stock prices to measure stewardship does not isolate the past performance of management.

Second, stock prices capture the impact of both management performance and firm performance, with no ability to distinguish between the two. Current changes in stock price may be caused by the actions of a past manager or may result from a shock exogenous to the company. Core to the concept of stewardship is the link to management performance and responsibility. Standard setters consistently refer to management's stewardship role, not the firm's stewardship role. While distinguishing management performance from firm performance is difficult, stock price changes make no attempt to differentiate. Meanwhile, compensation committees attempt to reward management performance. Several examples illustrate this point: (1) Benchmark Group PLC's 1999 annual report states "[we] provide a significant bonus opportunity related to the achievement of measurable objectives and an executive's personal contribution to the Group's overall results" (p. 20); and (2) Shaftesbury PLC's 2002 annual report states "an Annual Bonus Scheme, which provides rewards in relation to both Company and personal performance in a particular year" (p. 10). Compensation committees have access to internal company information, including management reports and scorecards, that allows an assessment of management performance that cannot be directly observed by shareholders. Overall, measuring stewardship using compensation provides better stewardship information than using changes in firm value.

Ideally, I will capture the component of management compensation that best reflects management's stewardship. According to Murphy (1999), CEO’s are primarily compensated using: salary, stock options, long-term incentive plans (LTIPs), and bonus. Salaries are set competitively and are benchmarked to industry averages. Stock options are not offered by all companies and are not offered on a consistent basis. For my sample, firms grant stock options in 33.3% of firm years (148 firm years). LTIPs are generally based on rolling-average three- or five-year cumulative performance and are paid out only in a limited percentage of firms (Murphy 1999). In my sample of 445 firm-years, cash LTIPs are paid out in 15 firm-years, while stock LTIPs are awarded in 69 firm-years. Bonuses are generally paid out annually and are offered by most firms. Core, Guay and Verrecchia (2003) find that while much of CEOs' incentives stem from stock and option compensation, standard agency predictions are not supported when CEO total compensation including stock and option compensation is used; they find that when CEO total compensation is used, a positive relationship is found between the variance of and the weight placed on price and non-price performance measures, contrary to standard agency predictions.

In my testing, I model the influence of annual performance measures on annual change in compensation, which allows annual observations to provide maximum testing power for my sample. Salary and bonus are annual compensation items that are designed to reward that year’s performance. Since my goal is to link the stewardship reward (i.e. compensation) to management's stewardship for the reward period, annual cash compensation best achieves that goal. Stock-based compensation does not provide a clear link to past performance for several key reasons. First, LTIPs are awarded based on several years of performance, which makes the link between performance and reward less direct. Further, most stock LTIPs (81.1% in my sample) are distributed only when performance targets are achieved post-grant. The performance targets are typically three years. For example, in 2003, The British Land Company PLC required growth in net asset value per share over a three year period to exceed an industry benchmark for LTIP stock grants to vest. Many stock option grants in the UK similarly have future performance requirements for vesting. For example, in 2003, Brixton PLC required total shareholder return to be above the median return for the sector over a three-year period following the grant.

Second, stock options are often rewarded to align the incentives of management and shareholders, not to reward past stewardship. For example, Workspace Group PLC states, in their 2005 annual report, that share options are granted to management since it "aligns their interests with those of ordinary shareholders" (p. 58). As further evidence of the desire to align incentives and not to reward past stewardship, I find in my sample that stock options are granted in 29.9% of firm-years (including initial observation years and years of CEO change), while stock options are granted in 59.0% of firm-years where a CEO change occurs. Since the CEO is new to the firm during the year, the stock option awards are designed to incentivize future behavior, not to reward past behavior. Thus, stock-based compensation in my sample may incentivize future positive management stewardship, but poorly represents a reward for past stewardship, which I require to test whether revaluations are rewarded.

In my testing, I am interested in identifying which performance measures best capture stewardship; for share options and stock rewards, the causality link is more difficult to identify since they are generally not offered as a reward for past action. Since standard agency predictions are supported with cash compensation, cash compensation reflects annual performance, and cash compensation reflects the reward for past performance, I measure CEO compensation annual cash compensation, specifically, salary, bonus, and benefits. I include benefits since many firms aggregate salary, bonus and benefits in the first observation year. My results are not sensitive to the choice of including benefits.

4.2 Model of Executive Compensation

Lambert and Larcker (1987) build on Holmstrom (1979) to model executive compensation. Managers choose to provide an unobservable amount of effort, which various performance measures reveal with noise. Consequently, performance measures must be rewarded that reveal some information about manager effort. Lambert and Larcker find that a performance measure's weighting is decreasing in its noise and increasing in its sensitivity to management effort, since less noise and greater sensitivity provide a stronger signal of manager effort. They further form a multi-period model that considers the realized performance measures from prior periods, with the logic being that past period performance is used to set targets for current period performance, with performance above the target (i.e. unexpected performance) being used to set compensation rewards.

Baber, Kang, and Kumar (1998) use the above basis to model the concept of unexpected performance being rewarded for earnings and returns:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 UE(EARN)_{i,t} + \alpha_2 UE(RET)_{i,t} + \varepsilon_{i,t}$$

with UE(EARN) and UE(RET) representing unexpected earnings and unexpected returns respectively. The coefficients α_1 and α_2 are expected to vary based on noise contained in the signals and the sensitivity of those signals to manager effort. I use the above model as a basis for my testing, but I make setting-specific adjustments, which include breaking earnings into core earnings, permanent revaluations, and gains/losses on disposal. Further, I incorporate both FV and HC gains and losses for investment properties.

4.3 Hypothesis 1: Stewardship-Relevance of Revaluations

To test whether FVs are incrementally informative for assessing management's stewardship beyond HCs (**H1**), I modify the model discussed in the previous section. As discussed in the Section 4.1, I use CEO cash compensation. I then use the percentage change in CEO cash compensation (ΔCOMP) as my dependent variable, which is the percentage change in cash compensation from year *t*-1 to *t*. Modeling changes in compensation allows firms and CEOs to act as their own controls and is consistent with compensation literature, allowing me to build on existing knowledge.[11] I decompose earnings into a number of components to allow the compensation relevance of each component to vary. Specifically, I break earnings into: (1) core earnings, typically relating to rental activities; (2) gains/losses on sales of investment property; and (3) permanent write-downs of investment properties. For core earnings, I include two potential choices for unexpected earnings (UE(EARN)): (1) earnings changes (ΔEARN), which presumes the performance benchmark used for rewarding earnings is earnings from the prior year (calculated as the percentage change in EARN from year *t*-1 to *t*; and (2) earnings levels (EARN), which presumes the performance benchmark is zero earnings. The inclusion of both EARN and ΔEARN follows the work by Baber, Kang and Kumar (1999) that earnings levels and changes together provide a more complete view of unexpected earnings in the compensation context. Since compensation committees may use either prior year earnings or zero earnings or a combination of both, I include both explanatory variables in my model. For gains/losses on sales of investment properties (GL) and permanent write-downs (PERM_REVAL), I include the levels of both measures since annual investment property sales are expected to be independent and permanent write-downs occur infrequently. Consistent with Baber, Kang, and Kumar (1998), I measure unexpected stock returns as actual annual stock returns (RET), which presumes an expectation of zero return.

Next, I include the variables required for the testing of **H1**. First, I include the actual realizations of past investment property revaluations on final sale (GL_HC), which represent FV changes recorded in past years that are realized in the current year. GL_HC represents the primary output of the HC

[11] In Section 7.2.8, I use compensation levels as a dependent variable to ensure my results do not stem from this modeling choice.

accounting system and is quantified in the financial statement "Note of historical cost profits and losses". Since I believe investment property sales are independent from year to year (i.e. a prior year benchmark is not meaningful), I include the level of GL_HC rather than the change. A vector of year indicator variables (YEAR) is used to capture any industry-wide effects that affect my sample as a whole. Finally, I include annual changes in the FVs of investment properties (termed ‘revaluations’) in my model (REVAL). Annual revaluations represent the primary output of FV accounting and represent the estimated change in FV from the previous measurement date, which is the prior fiscal year end. These revaluations are quantified in the financial statement "Statement of total recognized gains and losses". To facilitate comparison with GL_HC, I include revaluation levels, rather than changes, in my model, which implicitly assumes an expectation model of zero revaluations. In Section 7, I relax this implicit assumption and test industry-adjusted revaluations. Combining the above explanatory variables leads to the following model:

$$\begin{aligned} \Delta COMP_{i,t} = {} & \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} \\ & + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t} \end{aligned} \quad (1)$$

See Table 2 for definitions of all regression variables. Subscript *i* represents firm, while subscript *t* represents fiscal year in all models. A positive and significant coefficient, α_7, would provide support for **H1**. I deflate ΔEARN, EARN, GL_HC, PERM_REVAL, GL, and REVAL by opening market value of equity, which avoids potential problems with using a deflator that contains actual asset FVs that may lead to biased results. My choice of deflator is consistent with Dietrich, Harris and Muller (2001); I test whether my results are sensitive to this choice in Section 7.1.1. All non-indicator variables are winsorized at the 1st and 99th percentiles.

4.4 General Regression Model for Testing Hypotheses 2-5

I test **H2** through **H5** by modifying model (1) to include various factors that I hypothesize affect the extent to which investment property revaluations provide information useful for assessing management's stewardship. The general model for **H2-H5** is:

$$\begin{aligned}\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} \\ + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 FACTOR_{i,t} \\ + \beta_9 REVAL_{i,t} \cdot FACTOR_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}\end{aligned} \quad (2)$$

A positive and significant coefficient, β_9, would provide support for **H2-H5**.

4.5 Hypothesis 2: Increased Stewardship-Relevance of Revaluations with Improvements in Objectivity and Verifiability

With **H2a-H2d**, I hypothesize improvements in objectivity and verifiability or decreases in subjectivity improve the usefulness of FVs in assessing stewardship. While the concept of estimate hardness stems from the stewardship literature, the concept of signal-to-noise ratio from the compensation literature would lead to similar predictions, although subjectivity may imply bias in a particular direction. For example, a factor that improves estimate subjectivity and verifiability would presumably reduce the noise in the estimate, making it more useful for compensation contracting. Thus, while I frame **H2** in a stewardship context, **H2** is generally consistent with the compensation literature.

In **H2a**, I hypothesize that the use of an external appraiser improves estimate objectivity and verifiability, which in turn leads to greater use of revaluations for stewardship. External appraiser are used in 95.1% of firm-years for an average of 96.9% of investment properties. To test **H2a**, I define EXT dichotomously; EXT = 1 if external appraisers are used for all sample years for greater than 90% of investment properties and EXT = 0 otherwise. I define EXT in this way to create a split between firms who use external appraisers each year for substantially all assets, which prevents managers from either opportunistically choosing the years when external appraisers are used or the properties that are being appraised. I choose 90% as a cut off since it is typically used as a rule-of-thumb in accounting standards to represent 'substantially all'. My results are robust to choosing any value from 75% to 100%. I believe that using all sample years for EXT introduces no look-ahead bias in my regressions because many firms either explicitly or implicitly have a policy of whether annual external appraisals are undertaken, thus compensation committees can rely on consistent external appraisals when EXT carries a value of 1. I perform additional robustness testing using only past years to determine if my results are affected by this choice of variable definition.

In **H2b**, I hypothesize that the presence of a Big N auditor contributes to improving the reliability of FV estimates since Big N auditors have greater expertise and resources compared to non-Big N audit firms. To test **H2b**, I define BIGN = 1 when the audit firm for a given firm-year is a Big N firm, who are: KPMG; Deloitte & Touche; PricewaterhouseCoopers, including predecessor firms of Price Waterhouse and Coopers & Lybrand; Ernst & Young; and Arthur Andersen. BIGN = 0 if any other audit firm is used.

In **H2c**, I hypothesize that stronger corporate governance leads to better FV estimates since strong BODs demand greater support for management estimates, thus increasing objectivity and verifiability. To test **H2c**, I define FACTOR = 1 when BOD strength is evident and FACTOR = 0 otherwise. I use four separate measures of BOD strength that have support in the governance literature: (1) IND = 1 when the percentage of independent directors is greater than the sample median[12]; (2) CEO_N_CHAIR = 1 when the CEO is *not* the board chairman; (3) BOD_SMALL = 1 when the BOD size is less than the sample median[13]; and (4) CEO_N_COMP = 1 when the CEO does *not* serve on the compensation committee.

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[12] Less than 50% of observations take a value of 1 for IND since 109 observations have the median value of 50% independent directors.
[13] Less than 50% of observations take a value of 1 for SIZE since 91 observations have the median value of 7 members on the BOD.

In **H2d**, I hypothesize the demonstration of management bias in making FV estimates clearly demonstrates subjectivity, which should lead to decreased usefulness of revaluations for stewardship. Since estimate bias is unobservable, I must make an estimate using available information. My method takes advantage of the notion that a reckoning exists for all FV estimates; if a manager continually makes biased FV estimates, eventually some properties with biased estimates must be sold, at which point a large loss (or gain) on sale would be recorded, revealing the biased estimate. My measure of bias will contain measurement error since large gains and losses relative to FV estimates may be due to factors other than estimation bias. For example, the discovery of environmental contamination since the most recent FV estimate may significantly reduce the selling price, causing a large loss independent of estimate bias. Thus, a finding that bias does not influence stewardship-usefulness may be due to the hypothesized relation not existing or due to measurement error.

To estimate bias, I first assume that all properties are sold mid-year and adjust the beginning-of-year FV estimate for half of the year's average change in commercial investment property values. Second, I recalculate the gain/loss on sale based on the revised FV estimate. Third, I take the absolute value of the gain/loss and measure the difference as a percentage of the value of the property sold (i.e. the percentage of error between actual selling price and FV estimate). I use absolute value since managers may demonstrate either overstatement bias to maximize reported asset values or understatement bias to maximize realized gains/losses on investment property sales. I then compare this percentage error to the average absolute percentage error for realized property sales in the UK for that year and assign BIAS = 1 for *below* average error and 0 otherwise. I use the RICS Valuation and Sale Price Report (2009) for the average absolute error by year from 1998-2005. For years prior to 1998, I estimated the average absolute error based on the relationship between error and growth in the value of commercial properties from 1998-2005. I believe that above average estimation error indicates the presence of management bias. My method is similar to that used by Dietrich, Harris and Muller (2001); however, they assume that all gains/losses on sale represent estimation bias. I attribute a value of 1 for low bias to allow interpretation of the coefficient in the same manner as **H2a-c**. I calculate bias only for firm-years having investment property sales that represent > 1% of opening investment properties. I require investment property sales to be > 1% of total investment properties to avoid data errors since many firms aggregate gains/losses when they are not significant to the firm. I perform additional testing using the sign of the bias to determine if greater explanatory power can be obtained.

4.6 Hypothesis 3: Increased Stewardship-Relevance of Revaluations When More Sensitive to Management Effort

With **H3**, I hypothesize increased sensitivity of FV changes to management effort should be accompanied by an increase in the use of those revaluations for compensation. Since I cannot directly observe sensitivity, I proxy sensitivity through CEO-specific growth opportunities. Lambert (2001) links the concept of sensitivity to controllability. With greater growth opportunities available to a CEO, revaluations are more controllable, since revaluations will flow to a greater extent from decisions made by that CEO relative to other uncontrollable events. Since managers have greater opportunity to influence a growth firm through strong investment choices, I believe growth opportunities proxy for sensitivity to management effort.

I define growth opportunities in two ways: (1) average CEO-specific net investment property additions (ADD); and (2) market-to-book ratio (MTOB). My first proxy is specific to my sample of firms to capture growth opportunities specific to real estate firms. I use average net investment property additions (i.e. additions less disposals) specific to a CEO prior to and including the current year to capture the controllability of revaluations to the decisions of the current CEO. If a firm has had net additions of zero for the entire duration of a CEO's tenure, that CEO has had little opportunity to influence investment property revaluations. Similarly, if a firm has had significant net additions throughout a CEO's tenure, that CEO has had much opportunity to influence revaluations. I avoid any look-ahead bias in my variables since I measure ADD based on years prior to and including the current year, while MTOB is calculated annually. To further avoid look-ahead bias, I calculate MTOB at the start of the year. I avoid sales growth as a proxy because I believe it does not represent growth opportunities for my sample; sales for real estate firms fluctuate significantly depending on whether assets are being sold in a given year.

My second proxy, MTOB, is the most common proxy for growth opportunities used in the literature (see for example O'Connell 2006; Almazan et. al 2010; and Ovtchinnikov 2010), since it captures the future growth prospects as viewed from the perspective of market participants. Even though my sample of firms differs from most due to the inclusion of FVs of investment properties in book value, I believe MTOB still captures relative growth opportunities amongst sample firms. By using MTOB, an apparent contradiction emerges; I aim to capture past growth opportunities available to a given CEO, but MTOB is a forward-looking measure. As noted below, MTOB identifies growth firms more generally, who will have both past and future growth opportunities.

To validate ADD and MTOB as valid growth opportunities proxies in my sample, I perform several tests. First, I assess whether current year ADD and MTOB are predictive of asset and investment property growth in the next year by dividing firms into low and high ADD and MTOB firms. High (low) ADD firms have next year asset growth rates of 0.191 (0.105), with high significantly greater than low (*p*-value = 0.0028). Further, high (low) ADD firms have next year investment property growth rates of 0.203 (0.111), with high significantly greater than low (*p*-value = 0.0022). Similarly, high (low) MTOB firms have next year asset growth rates of 0.201 (0.103), with high significantly greater than low (*p*-value = 0.0006), and next year investment property growth rates of 0.214 (0.107), with high significantly greater than low (*p*-value = 0.0004).

As a second validation, I test whether ADD and MTOB identify growth firms. I measure the average ADD and MTOB over all firm years and categorize firms as high or low ADD and MTOB based on the average. Next, I calculate average asset growth and investment property growth rates for each firm across all firm-years. Finally, I calculate the average growth rates for high and low ADD and MTOB firms. High (low) ADD firms have average asset growth rates of 0.365 (0.047), with high significantly greater than low (*p*-value = 0.0002), and average investment property growth rates of 0.515 (0.053), with high significantly greater than low (*p*-value = 0.0004). Similarly, high (low) MTOB firms have average asset growth rates of 0.300 (0.123), with high significantly greater than low (*p*-value = 0.0430), and average investment property growth rates of 0.452 (0.130), with high significantly greater than low (*p*-value = 0.0152). From the above analysis, I conclude that my measures of growth opportunities have predictive value for future growth and for determining growth firms, providing confidence the measures actually capture growth opportunities available to a CEO.

In additional analysis in Section 7.2.1, I investigate whether the weight given to revaluations for compensation purposes differs based on firm type, specifically whether a firm is a 'landlord' or a 'developer'. This firm-type split is related to the above concept of controllability and growth opportunity since CEOs of developer firms will have more potential to impact revaluations through their decisions and effort.

4.7 Hypothesis 4: Increased Stewardship-Relevance of Revaluations When Variance of Revaluations is Less

With **H4**, I hypothesize decreased variance of revaluations improves their usefulness for compensation contracting. I calculate variance on a firm-CEO-specific basis as the variance of revaluations over all firm-CEO years prior to and including the current year; VAR = variance of revaluations. I use total variance for my testing, which is consistent with Lambert and Larcker (1987). I require a minimum of five observations for a given firm-CEO to provide an adequate time series for assessing variance, providing 274 observations for 59 CEOs from 57 firms. Ideally, I would have a minimum of ten observations to measure variance; however, placing such a limit would reduce my sample size to 58 from 274 for a limit of five observations.

I expect high variance of revaluations for a given CEO to indicate poor stewardship. High variance may result from wide swings in the success and failure of investment property choices, potentially indicating low CEO effort. Further, high variance may indicate a CEO has invested in unusual properties that are difficult to value, causing estimation error and swings in value from year to year as opinion changes. My sample does not provide an ideal setting to test the influence of variance of revaluations on stewardship due to my relatively short time series. Consequently, a null result may indicate lack of stewardship-usefulness or a null result may simply indicate weak testing power.

To validate my measure of variance, I divide CEOs into high and low variance groups based on the average variance for CEOs having more than five observations. I then calculate the average firm risk (i.e. variance of daily stock returns) over each CEOs tenure, with the belief that CEOs investment property choices will also impact risk. Finally, I test to determine whether high-variance CEOs are also high-risk CEOs. I find high-variance CEOs have higher average risk (0.2314 versus 0.1652), which is marginally significantly higher (one tailed p-value = 0.0785). The above provides some evidence that my variance measure captures poor stewardship through poor risk-taking choices.

4.8 Hypothesis 5: Increased Stewardship-Relevance of Revaluations When Persistence of Revaluations is Greater

With **H5**, I hypothesize increased persistence of revaluations improves their usefulness for compensation contracting. I calculate persistence consistent with variance above; firm-CEO-specific persistence is calculated based on all firm-CEO years prior to and including the current year; PERSIST = persistence of revaluations. I calculate persistence of revaluations by regressing revaluations on lagged revaluations and using the mean coefficient estimate for lagged revaluations over available firm-CEO years up to and including the current year. Consistent with variance, I require a minimum of five observations for a given firm-CEO to be included in my sample, leaving 274 observations for 59 CEOs over 57 firms. As above, requiring a minimum of ten observations to calculate persistence would reduce my sample size to 58 observations.

Strong persistence of revaluations for a particular CEO is expected to indicate positive stewardship. Persistence indicates consistency in the ability of a CEO in selecting investment properties, which in turn provides an indication of management effort. As a result, I expect CEOs able to generate persistent revaluations to be rewarded to a greater extent for those revaluations to reward effort. As above, my setting is not ideal for testing persistence due to my relatively short time series for most firm-CEOs, which results in an inability to differentiate between a null result indicating no relationship or weak testing power.

To validate my measure of persistence, I divide CEOs into high and low persistence groups based on the average persistence for CEOs having more than five observations. Next, I calculate the average increase in asset and investment property values over a CEO's tenure, with the belief that CEOs generating more persistence in revaluations also generate asset growth. Finally, I test asset and investment property growth between the high and low persistence groups. I find high-persistence CEOs generate higher average asset increase (0.244 versus 0.152), which is marginally higher (one-tailed *p*-

value = 0.103). Further, high-persistence CEOs generate higher average investment property increases (0.321 versus 0.167), which is marginally significant (one-tailed *p*-value = 0.098). Overall, the above tests provide some evidence that persistence of revaluations indicates a CEO's positive stewardship.

Chapter 5
Sample Selection and Descriptive Statistics

5.1 Sample Selection

I use UK real estate firms as my sample for several reasons: (1) investment properties represent an economically significant component of total assets (average of 85.4% for my sample); (2) SSAP 19 requires FV accounting for all firms, while HCs and HC gains/losses are also provided; (3) investment properties require symmetric FV recognition; (4) investment properties require FV estimates that would generally be considered as Level 2 estimates under SFAS 157, "Fair Value Measurements", providing a rich setting where the reliability of FV estimates has been questioned; (5) FV accounting has been required since 1981, avoiding problems with transition years; (6) detailed compensation disclosures have been required since 1995, providing an adequate time series to perform analysis; (7) the UK real estate industry is large enough to make statistically valid inferences; and (8) choosing a single industry eliminates alternative explanations based on cross-industry differences. Consequently, real estate firms in the UK provide a strong setting to test the relationship between FV accounting and stewardship.

By choosing a single industry in a specific country, I am able to make valid inferences based on the homogeneity of my sample; however, such a choice may limit the generalizability of my results to other settings. In Section 3, I described the background for my chosen industry. The UK used FVs for investment properties since 1981; consequently, firms are comfortable in applying FVs. Further, professional valuers have developed rigorous standards to support such valuations. Thus, my results may not hold in a setting where firms are new to FVs for investment properties and proper valuation procedures have not yet been established. Further, investment properties are different from other fixed assets; they have more readily-determinable FVs than unique pieces of equipment due to the ability to use comparable transactions or a defined future revenue stream to establish FV. Overall, my setting provides an ideal opportunity for testing my hypotheses, however, caution should be exercised when extending my results beyond my setting.

I use all UK real estate firms with required data available from 1994 to 2005 for my sample. All data except detailed compensation information is available before 1994 and I collect such data for past-looking measures. Even though investment property FVs have been required since 1981, detailed compensation information for LSE main-market-listed firms has only been required since 1995, based on the recommendations of the Hampel Committee. Since most firms provided prior-year comparative compensation information when adopting these recommendations, I am able to collect data for 1994. Further, I limit data collection to the years prior to IFRS adoption in the UK, which affected years ending on or after December 31, 2005, since IFRS changes the calculation of earnings and permits companies to choose whether to apply FV or HC for investment properties. Consequently, I expect the post-IFRS period and particularly the adoption period will create too many differences to pool these years with pre-IFRS years. See Table 2 for sample selection detail.

Using firms defined as real estate firms in Datastream, I identify 82 firms (633 firm years) with all data available for a minimum of 2 years to allow calculation of a minimum of 1 observation. I include firms that become inactive as some point in my sample period. Datastream is used for stock return and market value data. All other data are hand-collected from company annual reports that are obtained either directly from company websites or from Companies House UK. After losing the initial firm-year to calculate change variables, the initial year for new CEOs, observations missing opening market value, and dropping firm-years where investment properties represent less than 50% of total assets, my final sample contains 75 firms and 445 observations from 1994 to 2005. I exclude firms having less than 50% of total assets in investment properties to ensure that I capture firms where real estate is the firm's principal activity (consistent with Muller and Riedl 2002). I assess the impact of this choice on my results in Section 7.1.1. Several firms provided detailed compensation data before they were required to do so in

1995, allowing me to include 1994 observations. Observations for 2005 are included when firms do not adopt IFRS until fiscal 2006 due to a non-December year end. The number of observations per firm ranges from 1 to 11, with a mean of 5.9 and median of 6 observations per firm (see Table 2, Panel C for detail).

5.2 Descriptive Statistics

Table 3 presents definitions for all regression variables. Table 4 presents descriptive statistics for firm characteristics in Panel A and regression variables in Panel B. From Panel A, the average firm has £954 million of total assets, of which 85.4% (£815 million) are investment properties. Sales are low relative to assets, with only £0.07 generated for each £1 of assets; however, firms generally reflect only the profit/loss, rather than the gross proceeds, on investment property sales in revenue, causing revenue to poorly reflect total firm economic activity. Earnings after tax are high relative to sales, with an average profit margin of 27.0%. On average, firms have a market-to-book ratio of 73.9%, which is lower than traditional firms due to book value including investment properties at fair value. Further, book value does not reflect the tax consequences of asset sales (as discussed in Section 3.1), which would be reflected in market value, causing market-to-book ratios below 1. With the average premium of FV over HC of £245 million and assuming an average tax rate of 28%, which is the general corporate rate in the UK, shareholders' equity would be reduced by £68.6 million. If the future tax consequences are considered, the revised average market-to-book ratio rises to 91.1%, which is still below 1, potentially suggesting that investors discount FV estimates to a modest extent. Investment property FVs differ in an economically significant magnitude from HCs, with FVs being 143.0% of HCs on average. The FV premium represents 25.7% of total assets on average. CEO cash compensation averages £0.349 million, which is less than Conyon and Murphy's (2000) finding of average UK CEO cash compensation of £0.454 million for 1997; however, they use the largest UK firms. As a comparison, Conyon and Murphy (2000) find the average US CEO's cash compensation for 1997 is £1.640 million.

From Panel B, cash compensation increases annually by an average of 18.5%, with cash compensation falling in 16.2% of observations. Annual earnings increases (ΔEARN) average 3.2% of market value, while earnings (EARN) average 4.7% of market value. The recognition of past revaluations on final sale (GL_HC) is significant on average, representing 2.6% of market value. Permanent write-downs in the value of investment properties (PERM_REVAL) occur in 5.2% of firm years. Firms are conservative on average when valuing investment properties, with an average gain of 0.8% of market value over the most recent FV estimate (GL), such estimation conservatism is consistent with Dietrich, Harris and Muller (2001); however, Dietrich, Harris and Muller (2001) find the mean absolute value of gain/loss on investment property sales as a percentage of the most recent FV estimates is 27.0%. The comparable figure for my sample is 14.5%. The difference suggests valuations have become more accurate during my sample period of 1994-2005 versus their sample period of 1988-1996. Annual investment property revaluations (REVAL) are economically significant at 12.3% of market value on average. Firms are growing rapidly on average, with firms adding 28.2% of market value in net investment properties additions annually (ADD).

Chapter 6
Empirical Analysis

6.1 Analysis of Correlations

Table 5 presents a correlation matrix for all regression variables included in testing **H1-H5**. I find strong Pearson correlations between compensation changes (ΔCOMP) and the traditional variables of earnings (EARN), and stock returns (RET) (p-values < 0.05). Earnings changes (ΔEARN) and ΔCOMP have lower Pearson correlation with p-value = 0.055. Using Spearman rank correlations, only RET is correlated (p-values < 0.001). Of the components of earnings, I find permanent revaluations (PERM_REVAL) are correlated with ΔCOMP (Pearson (Spearman) p-value = 0.059 (< 0.001)). As predicted in the stewardship literature (e.g. Ijiri 1983), the realization of past investment property revaluations upon final sale (GL_HC) is correlated with ΔCOMP (Pearson (Spearman) p-value < 0.001 (= 0.026)). Finally, I find strong correlation between revaluations of investment properties (REVAL) and ΔCOMP (Pearson and Spearman p-values < 0.001). I find REVAL is also strongly correlated with stock returns (Pearson and Spearman p-values < 0.001), consistent with my expectation based on the value-relevance literature. Growth firms appear to have faster growing compensation, with net investment property additions (ADD) demonstrating strong positive correlation with ΔCOMP (Pearson and Spearman p-values < 0.01). Overall, relationships expected from past literature appear to exist in my data.

6.2 Results of Testing H1: Stewardship-Relevance of Revaluations

Table 6 presents univariate evidence demonstrating the relationship between REVAL and ΔCOMP by presenting the mean and median ΔCOMP by REVAL decile. The difference between the first decile (lowest) and tenth decile's (highest) REVAL mean and median are 33.1% and 16.6% respectively, while the overall sample mean (median) is 18.5% (10.5%). Using a t-test (Wilcoxian rank-sum) test, the mean (median) differs between the first and tenth deciles with *p*-value = 0.0005 (< 0.0001). The median ΔCOMP increases nearly monotonically as REVAL increases, while the mean ΔCOMP demonstrates a clear pattern of increases as REVAL increases. Overall, Table 5 provides preliminary evidence supporting **H1**.

In Table 7, I use multivariate pooled regression analysis to test **H1** using model (1). In this model and subsequent models, unless otherwise stated, I include year indicator variables to reduce the potential for cross-correlation. Further, I cluster standard errors by firm to adjust for any correlation between observations of a given firm. In regression 1, I include only the traditional explanatory variables of changes in earnings (ΔEARN), earnings (EARN) and stock returns (RET) to explain changes in cash compensation (ΔCOMP). The relationship between EARN and ΔCOMP is weakly positive (*p*-value < 0.1), while the relationship between ΔEARN and ΔCOMP is not statistically significant to conventional levels. In univariate regression (untabulated), I find ΔEARN is associated with ΔCOMP to 95% confidence. While I observe the relationship between RET and ΔCOMP to be significant as expected, the earnings-compensation change relationship is weaker. There are several compelling reasons why I may fail to find a strong earnings-compensation change relationship: (1) ΔEARN and EARN exclude both permanent write-downs (PERM_REVAL) and gains/losses on investment property sales (GL), reducing the explanatory power of earnings; (2) real estate firms focus on strategic long-term acquisition and development of properties, causing short-term earnings trends to be less important; and (3) earnings may be less awarded in compensation in the UK due to country-level characteristics, relative to the US. For example, Conyon, Peck and Sadler (2000) find only a weak relationship between earnings and compensation. While O'Connell (2006) finds a relationship between earnings changes and changes in CEO cash compensation, he calculates earnings changes as a percentage, which is problematic when earnings are negative. If I scale earnings in a manner consistent with O'Connell (2006), the relationship between earnings and compensation in my sample becomes more significant.

As expected, stock returns (RET) have a significant positive association with ΔCOMP. I find permanent revaluations (PERM_REVAL) (i.e. investment property impairments) are associated with ΔCOMP to 99% confidence, which indicates CEO compensation may be sensitive to one-time losses. Gains and losses on investment property sales relative to the most recent FV estimate (GL) are not associated with compensation increases, which is consistent with expectation since GL stems from FV estimation error.

In regression 2, I add GL_HC, which represents the past revaluations of investment properties that are now realized through final sale (i.e. REVALs from past years realized in the current year). GL_HC is the difference in realized gain/loss between FV and HC accounting and represents the primary information conveyed under HC accounting. Since GL_HC is significantly positively associated with ΔCOMP (one-tailed p-value < 0.05), I infer that compensation committees do not fully reward FV increases until realized through eventual sale. For example, suppose a property is purchased in 2000 for £1 million, is valued at £1.5 million in 2001, and sold for £1.5 million in early 2002. In this example, the £0.5 million increase in value is REVAL for 2001 and GL_HC in 2002. If the FV increase is fully rewarded in CEO compensation in 2001, then GL_HC will not be associated with changes in cash compensation in 2002. Since I find GL_HC is associated with ΔCOMP, compensation committees hold back some of the compensation benefit of FV increases until final realization. The realization of these past revaluations contains stewardship information, causing an increase in adjusted R^2 to 6.9% from 4.7%, which is significant to 94% confidence using an F-test (p-value = 0.06). The coefficient on RET changes little with the inclusion of GL_HC (0.143 versus 0.148), suggesting that HC information is not being captured by stock returns.

In regression 3, I include investment property revaluations (REVAL), which is the primary information contributed by FV accounting, and exclude GL_HC, to determine the incremental impact of REVAL. Adjusted R^2 increases to 7.0% from 4.7%, representing a similar increase to when GL_HC was included. The increase in explanatory power provided by REVAL is significant (p-value = 0.002). Further, the inclusion of REVAL in the regression decreases the explanatory power of RET, with the coefficient decreasing 74.3% to 0.038 from 0.148 in Regression 1. In section 3.2, I discussed that stock returns are typically associated with changes in cash compensation, even though compensation contracts are rarely tied explicitly to stock returns. Regression 3 suggests that revaluations may be an omitted variable explaining part of the association between stock returns and changes in cash compensation for sample firms. Nevertheless, since the adjusted R^2 increases, revaluations have additional explanatory power beyond simply explaining part of the stock returns-changes in cash compensation relationship.

Regression 4 includes both HC accounting (GL_HC) and FV accounting (REVAL), while Regression 5 adds year indicators and clustering of standard errors by firm, which is the complete form of model (1). Since the results for the key variables of interest are similar between Regressions 4 and 5, I focus my discussion on Regression 5. The adjusted R^2 increases to 9.5% when I include both FV and HC, which is higher than either only FV (R^2 = 7.0%) or only HC (R^2 = 6.9%) and is significant for REVAL (p-value < 0.01) and weakly significant for GL_HC (p-value = 0.06). The increase in combined explanatory power demonstrates that FV and HC capture different stewardship information. Further, the explanatory power is largely independent; the coefficients and significance of GL_HC and REVAL remain largely unchanged when both are input into the model (0.905 versus 0.854 for GL_HC, and 0.374 versus 0.354 for REVAL). The positive and significant coefficient on REVAL in regression 5 provides support for **H1** since FV changes provide stewardship information incremental to HCs. Further, the impact of REVAL on compensation changes is economically significant with a one-standard-deviation increase in REVAL being associated with a 7.2% increase in CEO cash compensation, which is approximately £25,000 on average. Overall, I find support for **H1** and interpret regression 5 to suggest that compensation committees accept that investment property revaluations are adequately reliable to be used in compensation contracting; however, the full reward for FV increases is not given to CEOs until final sale.

Since GL_HC and REVAL are expressed in the same measurement (i.e. in millions of pounds and scaled by opening market value), I compare the coefficients to determine whether realized FV changes (GL_HC) are weighted heavier in compensation than annual revaluation estimates (REVAL). Using an F-test, I cannot reject the null that the coefficients for GL_HC and REVAL are equal (p-value = 0.223); consequently, I cannot determine whether on-going revaluations are weighted differently to realized FV changes. Throughout the remainder of my analysis, I consistently find GL_HC has a larger coefficient; however, with few exceptions, GL_HC and REVAL are not statistically different, meaning that I can only conclude that both GL_HC and REVAL are stewardship-relevant, not which measure is more relevant.

In Regression 5, I find EARN has explanatory power for ΔCOMP (one-tailed p-value < 0.05), while ΔEARN is not associated with ΔCOMP. This finding suggests that that core earnings rather than changes in core earnings are rewarded, which is unexpected since sample firms are consistently profitable with losses occurring in only 9.7% of firm-years. For the other two components of earnings: (1) GL is not associated with ΔCOMP, which is expected if GL represents error in FV judgments; and (2) PERM_REVAL is associated with ΔCOMP (one-tailed p-value < 0.05), suggesting CEOs are punished for making investment decisions that lead to permanent write-downs. In robustness testing, I find that the standard error for PERM_REVAL may be underestimated, suggesting caution should be used in interpreting the significant PERM_REVAL coefficient.

Using the Breusch-Pagan test for heteroskedasticity, I find that my regression data are heteroskedastic (χ^2 = 67.86; p-value < 0.0001 for Regression 5), so I use White's heteroskedasticity-consistent estimator in all regression models. Further, in robustness tests in Section 7, I bootstrap standard errors to ensure my statistical results are not driven by violations of normality assumptions. In addition, I test my regression results for collinearity and find all variance inflation factors are less than 2 for base regression variables.

6.3 Results of Testing H2: Increased Stewardship-Relevance of Revaluations with Improvements in Objectivity and Verifiability

In Table 8, I present regression analysis for assessing **H2**. In Panels A through G, regression 1 includes the additional objectivity/verifiability factor to determine any direct effect of the factor on ΔCOMP. In regressions 2 and 3, I include an interaction term to test the incremental impact of the factor combined with REVAL in explaining ΔCOMP. Regression 2 (regression 3) is run without (with) year indicators and standard errors clustered by firm.

Table 8, Panel A provides the results for testing **H2a** using model (2). **H2a** argues that revaluations will be more stewardship-relevant when external appraisers are use to improve objectivity and verifiability. EXT is assigned a value of 1 when external appraisers are used in all firm years for substantially all investment properties, minimizing the opportunity for external appraisers to be used opportunistically. In regression 1, I find the presence or absence of external appraisers has no direct impact on ΔCOMP, which is expected since the external appraiser and compensation decisions should be independent. In regressions 2 and 3, I find a significant, positive coefficient on REVAL ● EXT, with confidence to > 99%, thus supporting **H2a**. When I include REVAL ● EXT in the regression model, REVAL entirely loses significance, suggesting not only that revaluations are weighted to a greater extent when external appraisers are present, but that revaluations are *only* weighted for compensation when external appraisers are present. This finding supports the historical belief (e.g. Ijiri 1975; Gjesdal 1981) that accounting estimates must be hard to be useful for stewardship. Since revaluations are used for compensation to an economically-significant extent when external appraisers are present, my results suggest the use of external appraisers provides FV estimates that are adequately hard for stewardship purposes. In regressions 2 and 3, EXT has a direct negative impact on ΔCOMP. This negative coefficient may result from ΔCOMP being comparable at 18.2% (19.0%) when external appraisals are present (not present). A t-test suggests the group means are not statistically different from each other (p-value = 0.84). Since the mean REVAL is positive at 12.3% and the externally appraised /not externally appraised groups have comparable ΔCOMP, the coefficient on EXT must be negative to allow ΔCOMP to be comparable across the two groups. In untabulated analysis, I interact GL_HC with EXT to determine if the presence of external appraisers causes the realization of FV changes to be less useful. In other words, do external appraisals give enough confidence in FV estimates that compensation committees no longer need to hold back and reward the FV changes realized through sale? I find that EXT does not impact the usefulness of GL_HC for compensation, suggesting that compensation committees still reward the actual realization of FVs even in the presence of external appraisals.

I also test **H2a** using the different variable definitions from Section 7.1.1 to ensure that my results still hold. I find that when my results are not winsorized, the significance of REVAL ● EXT falls (one-tailed *p*-value = .127); however the coefficient estimate remains similar (0.455 versus 0.566 with non-winsorized data). Further, an F-test finds the REVAL + REVAL ● EXT is significantly different from zero (*p*-value < 0.0001). Finally, if I define EXT as requiring external appraisers in all years for > 95% or for 100% of investment properties rather than 90%, the significance of REVAL ● EXT in the non-winsorized data increases significantly with one-tailed *p*-values = 0.003. With 95% or 100%, the non-winsorized results provide no significance to REVAL, consistent with my findings in Table 8, Panel A. Overall, I conclude that since a slightly stronger EXT definition of 95% or 100% with winsorized data provides comparable results, my earlier conclusions continue to hold.

As a further robustness check, I define EXT = 1 if an external appraiser is use for greater than 90% of investment properties for all years prior to and including the current year for a given CEO, which eliminates the possibility of look-ahead bias. In untabulated results, I find similar results to above; however, the significance on REVAL ● EXT falls to p-value = 0.07 (one-tailed). An F-test of REVAL + REVAL ● EXT = 0 rejects the null with p-value = 0.0009. Overall, this additional definition provides support for my conclusion noted above.

Table 8, Panel B provides results for testing **H2b** using model (2). In **H2b**, I argue the presence of a Big N auditor improves the objectivity and verifiability of FV estimates due to greater resources, expertise, and negotiating power with the client. I measure BIGN = 1 when a Big N audit firm is used for a firm year. In regression 1, I find BIGN has no direct impact on ΔCOMP, which suggests that audit firm and compensation choices are independent. In regressions 2 and 3, I find that the presence of a Big N audit firm increases the usefulness of revaluations for stewardship purposes. For firms using Big N auditors, REVALs are associated with ΔCOMP at a rate of 0.456, of which, 76.8% (0.350 / (0.350 + 0.106)) stems from the presence of the Big N auditor and 23.2% remains independently. While REVAL and REVAL ● BIGN independently are not significantly different from zero to conventional levels, when combined, an F-test indicates statistical explanatory power (p-value = 0.002). The preceding suggests that revaluations may continue to be used for stewardship in the absence of a Big N auditor; however, such use does not differ significantly from zero. When I use the different variable definitions from Section 7.1.1 to ensure robustness of my results, the coefficient on REVAL ● BIGN loses statistical significance when non-winsorized data or the change in natural logarithm of compensation is used as a dependent, suggesting the influence of a Big N auditor on stewardship-usefulness of revaluations is not robust. Overall, the preceding provides very weak support for **H2b** that Big N auditors provide improvements in objectivity and verifiability of revaluations to increase stewardship-relevance. The significant negative coefficient on BIGN results from a similar situation to what was discussed under EXT. In untabulated analysis, I interact BIGN with EARN, GL_HC, and PERM_REVAL to determine if the presence of a Big N auditor improves other variables' stewardship-usefulness; no significant interactions are found.

In Table 8, Panels C through F, I explore the influence of corporate governance strength on the usefulness of revaluations for stewardship. **H2c** argues that firms maintaining strong corporate governance will demand greater support for FV estimates, causing those estimates to be more objective and verifiable. I measure corporate governance strength in four ways, with a value of 1 indicating stronger governance: (1) BOD independence measured by percentage of independent directors (IND); (2) CEO *not* acting as chairman of the BOD (CEO_N_CHAIR); (3) BOD size, with smaller size indicating more effective governance (BOD_SMALL); and (4) CEO *not* being a member of the compensation committee (CEO_N_COMP). From Table 4, I observe that all governance variables are strongly correlated, with Pearson and Spearman correlations significant to greater than 99% confidence; however, BOD_SMALL is *negatively* correlated with each of the other governance variables. Thus smaller BODs are less independent, and are more likely to have the CEO as chairman and/or on the compensation committee.

From regression 1 in Panels C through F, I observe no direct relationship between any governance variable and ΔCOMP, suggesting that CEOs do not use governance weaknesses to extract higher changes in cash compensation. From regressions 2 and 3 in Panels C through F, I observe that when the CEO acts as chairman (CEO_N_CHAIR = 0) or serves on the compensation committee (CEO_N_COMP = 0) (i.e. demonstrations of weak governance), revaluations are not relevant for assessing management's stewardship (i.e. the coefficient on REVAL is not significantly different from zero). When BODs are more independent (IND = 1), revaluations are rewarded to a greater extent (0.687) than when they are less independent (0.178). BOD size does not interact in a significant way with revaluations, suggesting that revaluations are rewarded to same extent regardless of BOD size, which may further indicate that BOD size does not capture the element of corporate governance that enhances FV estimates. Overall, three of the four governance measures provide support for stronger governance resulting in more objective and verifiable FV estimates that in turn lead to greater use of revaluations for stewardship, supporting **H2c**.

Further, revaluations are rewarded to a greater extent when governance is strong. The marginal reward for revaluations (REVAL + REVAL ● governance factor) is 0.687 when BOD independence is high, 0.612 when the CEO is not chairman, and 0.511 when the CEO does not serve on the compensation committee. These rewards compare to the 0.374 coefficient on REVAL for the entire sample. Although the coefficient on BOD_SMALL is not significant to conventional levels, the point estimate suggests that revaluations are rewarded to a lesser extent when BODs are small (0.299 versus 0.374 for the entire sample).

Table 8, Panel G provides results for testing the impact of FV estimate bias on the use of revaluations for stewardship (**H2d**). I calculate estimate bias in three steps: (1) I calculate the absolute value of the difference between sale proceeds and the most recent FV estimate, adjusted for current year growth; (2) I express the difference as a percentage of the FV estimate; and (3) I compare the percentage difference to the average difference for commercial property sales for that year and assign BIAS = 1 if the percentage difference is less than the average , indicating less bias and allowing coefficient interpretation consistent with Panels A-F. In regression 1, I observe that BIAS is not related to ΔCOMP. Further, in regressions 2 and 3, I find weak support for less-biased FV estimates being used to a greater extent for compensation purposes (*p*-value < 0.10). While the coefficient estimate for REVAL is not significant to conventional levels, the point estimate suggests that revaluations are still used in compensation when estimates are more biased. However, 65.6% of revaluation explanatory power stems from low bias (0.364 / (0.191 + 0.364)). Using an F-test, I find the total coefficient on REVAL for low bias firms (REVAL + REVAL ● BIAS) is significant (*p*-value = 0.003). Overall, I find weak support for **H2d**, which argues that less bias should result in FV estimates that are more useful for stewardship. In untabulated analysis, I calculate an indicator for negative bias and positive bias, which is assigned a value of 1 if gain/loss on sale exceeds the average industry-wide gain loss for that year. Neither the interaction of REVAL and negative bias, nor the interaction of REVAL and positive bias produces any statistical significance.

Considering the evidence from testing **H2a-d**, I find that increases in objectivity and verifiability lead to greater usefulness for stewardship purposes, supporting Ijiri's (1983) belief that stewardship information must be hard and refuting the belief that FV estimates are, by definition, too subjective to be useful for stewardship.

6.4 Results of Testing H3: Increased Stewardship-Relevance of Revaluations More Sensitive to Management Effort

In **H3**, I hypothesize that revaluations will be more stewardship-relevant when more sensitive to management effort. In Table 8, Panel A, I use average net CEO-specific investment property additions (ADD) as a measure of the growth opportunities available within a firm, which in turn indicates the sensitivity of revaluations to management effort. In Panel B, I use opening market-to-book ratio (MTOB) as a measure of firm growth opportunities, which is the traditional proxy used in the literature. Using a combination of a proxy specific to real estate firms (ADD) and the traditional proxy (MTOB) gives me confidence that I am capturing growth opportunities for my sample.

In regression 1 of Table 9, Panel A, I find a direct effect of ADD on ΔCOMP, suggesting that growth firms have faster growing CEO compensation independent of revaluations. This finding is consistent with CEOs being compensated for the amount of assets under their care, which I find in compensation levels analysis in Table 23. In regression 2 and 3, I find my real-estate-specific proxy for growth opportunities lead to heavier weighting of REVAL for compensation contracting, supporting **H3**, consistent with my interpretation of the predictions of Lambert and Larcker (1987), and Banker and Datar (1989). REVAL continues to directly affect ΔCOMP, which could imply my proxy for growth opportunities is imperfect. Since the coefficient on ADD falls when revaluations are included in the regression, I believe that the full benefit of real-estate-specific growth opportunities is not rewarded unless used to generate FV gains.

In regression 1 of Table 9, Panel B, I find opening MTOB has no direct affect on ΔCOMP; however, once MTOB is interacted with REVAL in regressions 2 and 3, I find MTOB directly affects ΔCOMP, which is consistent with the notion that growth firms have faster growing compensation. In regressions 2 and 3, I find that REVAL interacts with MTOB to make such revaluations more useful for stewardship, while REVAL loses its direct impact on ΔCOMP. I interpret these findings to suggest that revaluations are rewarded only in the context of controllability of those revaluations.

Overall, I interpret my results from Panels A and B to suggest that firms reward FV changes when those FV changes are more under the control of and thus sensitive to the efforts of the firm's CEO. In untabulated analysis, I also interact GL_HC with my growth opportunity proxies to determine if HC gains/losses are rewarded to a greater extent when more sensitive to management effort. GL_HC ● ADD fails to achieve significance (p-value = 0.69), suggesting real-estate-specific growth opportunities do not affect the weighting of HC gains/losses for compensation, perhaps due to the longer time lag between growth opportunity and realization for HC. In contrast, GL_HC ● MTOB is significantly positive (p-value = 0.001), while the independent significance of GL_HC is dramatically reduced (p-value = 0.164). This finding is consistent with REVAL above, with changes in values of investment properties, either realized (i.e. HC) or unrealized (i.e. FV), being weighted in conjunction with the sensitivity of those changes to management effort.

6.5 Results of Testing H4: Increased Stewardship-Relevance of Revaluations When Variance of Revaluations is Less

In **H4**, I hypothesize the variance of revaluations during a CEO's tenure will influence the extent to which those revaluations are used for compensation, based on the CEO compensation literature, which finds the variance of a performance measure impacts that measure's usefulness for compensation contracting. I calculate the variance of revaluations (VAR) based on all years of a CEO's tenure prior to and including the current year when I have a minimum of five observations. From regression 1 of Table 10, I find that variance of revaluations has no direct impact on ΔCOMP. Further, in regressions 2 and 3, I find that VAR does not interact with REVAL to make revaluations more (less) useful for compensation when variance is low (high), providing no support for **H4**. Since compensation committees may have access to a longer time series of information for a given CEO (i.e. data before a company is public) to better assess the variance of revaluations, I cannot determine with confidence whether the variance of revaluations has no influence on the use of revaluations for stewardship or whether I am simply measuring VAR with too much error to find statistically significant results. In untabulated analysis, I find comparable results when I use the variance of inflation-adjusted revaluations and industry-adjusted revaluations. Further, if I alter the choice of a minimum of five years to vary between two and ten years, I find insignificant results for all year choices with the exception of a minimum of eight years, which finds a significant negative coefficient on REVAL ● VAR. Overall, I find no support for **H4**.

6.6 Results of Testing H5: Increased Stewardship-Relevance of Revaluations When Persistence of Revaluations is Greater

In **H5**, I hypothesize that more persistent revaluations during a CEO's tenure will increase the usefulness of those revaluations for compensation contracting, extrapolated from the finding that earnings are more useful for compensation when persistent (Baber, Kang and Kumar 1998). The application of the concept of persistence to FV changes is unusual; however, I believe that strong CEO's are able to make consistently strong investment decisions that result in persistent revaluations over time. From the descriptive statistics in Table 4, Panel B, I note that the mean persistence is 0.134, which is different than zero with *p*-value < 0.0001. If I inflation-adjust revaluations, persistence falls to a mean of 0.119, which is different than zero with *p*-value < 0.0001. Finally, if I industry-adjust revaluations, persistence falls to a mean of 0.030, which is not statistically distinguishable from zero (*p*-value = 0.357). The above suggests that generating positive persistence of industry-adjusted revaluations is not done on average.

In regression 1 of Table 11, I find PERSIST is weakly negatively related to ΔCOMP, which becomes insignificant in regressions 2 and 3, once I interact PERSIST with REVAL. Further, I find that REVAL ● PERSIST is not statistically different from zero, which could indicate that persistence of revaluations is not rewarded or my measure does not truly capture persistence. In untabulated analysis, I find comparably insignificant results when I use the persistence of inflation-adjusted revaluations and industry-adjusted revaluations. Also, if I alter the choice of a minimum of five years to vary between two and ten years, I find insignificant results for all year choices. Overall, I find no support for **H5**.

Chapter 7
Robustness Checks and Additional Analysis

7.1 Robustness Checks

7.1.1 Measurement of Variables

In defining variables for my regression analysis, I made several choices that may impact the strength of my statistical results. In this section, I alter these choices and tabulate results to ensure that my principal results continue to hold regardless of these decisions. First, I chose to winsorize all continuous regressions variables by assigned values outside of the 1st and 99th percentiles to the value of the 1st and 99th percentiles respectively. In Table 12, Panel A, regression 1, I present results for testing **H1** without winsorizing continuous variables. All results are comparable to Table 7; however, model explanatory power drops from an R^2 of 9.5% to 6.5%.

My dependent variable ΔCOMP is skewed with a mean of 0.185 and a median of 0.105. To reduce skewness, I measure my dependent variable as the change in the natural logarithm of cash compensation from year *t*-1 to year *t*, which provides a mean of 0.134 and a median of 0.100. In regression 2, I test my model for **H2** using the revised dependent variable. All results are consistent with Table 7.

In my principal analysis, I scale all independent variables by opening market value, which causes some large values due to the scaler being quite small in some cases. In regressions 3 and 4, I scale independent variables by opening total assets and opening investment properties respectively, allowing three additional observations since opening market value is not needed. My main regression results from Table 7 continue to hold; however, ΔEARN loads more strongly than EARN when I scale by assets, while neither ΔEARN nor EARN load significantly when I scale by investment properties. The weak results for earnings in compensation are consistent with the compensation literature in the UK (e.g. Conyon, Peck and Sadler 2000).

Finally, in regression 5, I eliminate the screen of requiring investment properties to be greater than 50% of total assets, raising the total number of observations to 512. My principal results from Table 7 continue to hold; however, several differences emerge: (1) EARN shows less significance, which is consistent with regressions 3 and 4; (2) stock returns (RET) demonstrates a weak relationship with ΔCOMP, which could indicate that revaluations explain less of stock returns for firms where real estate is less important; and (3) PERM_REVAL becomes no longer significant, which indicates that my earlier results for the compensation-relevance of permanent revaluations should be interpreted with caution.

Overall, I conclude that variable definition choices do not affect the validity of my primary results.

7.1.2 Serial Correlation

Since my sample involves following firms over a period of years, a firm's observations may not be independent from each other, causing standard errors to be downward biased and thus overstating the strength of my results. While the changes model specification I use is more likely to maintain independence of observations, I perform additional testing to ensure my results are unaffected by serial correlation. I begin by testing for serial correlation in regressions 1-5 of Table 6 using the Wooldridge test for autocorrelation in panel data (described in Drukker 2003). Using this test, I generally reject the null of no first-order serial correlation in my data with *p*-values ranging from 0.0437 to 0.0763. To combat the serial correlation, I first cluster standard errors by firm in the regression models already presented, producing standard errors that are unbiased.

Second, I re-estimate my regression models using Prais-Winston regression, which uses a generalized least-squares method of parameter estimation in which errors are assumed to follow a first-order autoregressive process. All previous analysis applies equally with the Prais-Winston regression, with the exception of permanent revaluations, which demonstrate weaker significance using this regression method. I reproduce Table 6's regressions using Prais-Winston regression and display the results in Table 12, Panel B. Testing of **H2-H5** is also reperformed using this methodology with conclusions remaining unchanged. For brevity, I tabulate only the retesting of **H1**.

Third, I re-estimate standard errors using the Newey-West estimator, which corrects standard errors for serial correlation and heteroskedasticity. All results remain unaffected using this estimator, with the exception of the influence of permanent revaluations and earnings on changes in cash compensations, whose statistical significance is reduced. Once again, I reproduce only **H1** testing using the Newey-West estimator (see Table 12, Panel C).

Finally, I re-estimate my regression models using indicator variables for each firm, generating a firm-level fixed effect. The firm-level fixed effects capture differences between firms that may result from investing in different geographical areas that may be related to the compensation decision. Table 12, Panel D, presents the results for re-estimating **H1** testing using firm fixed effects. Seventy-two firm indicators are included as independent variables (firms having only one observation are not assigned a separate indicator). Significant results remain unchanged with the added firm indicators. Results of re-estimating **H2-H5** are again not tabulated for brevity, but existing conclusions remain unchanged.

Overall, I conclude that potential presence of serial correlation in my data, caused from having multiple observations for each firm, does not impact my previous conclusions.

7.1.3 Cross correlation

Since my sample represents firms in a single industry, the potential exists for exogenous shocks to occur that impact the sample as a whole within a given year, causing the error terms among firms to be correlated for that year. Consequently, the ordinary least squares (OLS) assumption of no error term correlation would be violated, biasing standard errors. To address potential cross correlation, I first include year fixed effects in the regressions already presented, which capture the impact of industry-wide effects in a given year. Since the inclusion/exclusion of year indicator variables in my regressions: (1) has minimal impact on the significance of the variables of interest; (2) has minimal impact on each model's explanatory power, with adjusted R^2's typically improving by 0.2% to 0.3%; and (3) individual year indicator variables do not achieve statistical significance in my econometric models, I infer that cross correlation does not represent a significant problem for my data set.

Nevertheless, I re-estimate my regression models using the Fama MacBeth regression method. I present the re-estimation results for **H1** testing in Table 12, Panel E. Under Fama MacBeth, I run annual OLS regression and take the average of the annual coefficients; standard errors are estimated using the standard deviation of the annual slopes. The number of observations for each annual regressions ranges from 13 to 57, with 1994 observations pooled with 1995 observations (see Table 2, Panel B). Due to the small number of observations in each regression, idiosyncratic noise becomes more evident in annual regressions since it is not averaged out over the entire sample period as with pooled regression. I calculate coefficient estimates weighting each year equally (Unweighted column) and weighting each year based on its relative share of total observations (Weighted column). Significant noise is evident through using annual regressions since R^2 drops to 2.5% from 13.2% when using pooled regression. Further, all regression coefficients fail to achieve statistical significance, with the exception of REVAL in the Unweighted regression achieving marginal significance. Similar findings result from re-estimation of **H2-H5** testing using Fama MacBeth. Based on the preceding discussion, I believe the Fama MacBeth regression method is not an appropriate method for hypothesis testing in my sample.

7.1.4 Influential Outliers

Particular observations may significantly influence regression coefficients due to their unique characteristics. I minimize the impact of outliers in several ways. First, much of data is hand-collected, reducing the probability of errors in sample that may be considered outliers. Further, I investigate large and unusual annual changes by tracing back to annual report data to correct any collection errors. Next, I winsorize all continuous regression variables at the 1st and 99th percentiles by assigning observations outside of these percentiles the value of the 1st or 99th percentile. I perform the winsorizing procedure for several reasons: (1) to reduce the impact of any remaining data errors in my sample; and (2) to reduce the impact of extreme values that are caused by scaling procedures. For example, I scale REVAL by opening market value, which could be unusually low due to market rumors at my measurement date, skewing the market value to an artificial low and REVAL to an artificially high figure. Overall, I believe the above procedures minimize the probability of outliers that are influential due to data error or artificial values, thus the observation values represent the data and influential observations are true and should be influential.

Nevertheless, I calculate Cook's D following each regression and remove observations where Cook's D is > 4/N, where N represents the number of observations in the regression. I retest **H1** after removing outliers and display the results in Table 12, Panel F. No extreme outliers are noted with the maximum Cook's D in regression 5 of 0.341. Numerous observations are noted above the 4/N threshold and 22-26 outliers are removed from each regression. My principal results hold with the removal of these outliers, with the following differences: (1) ΔEARN becomes significant, while EARN loses significance, which may result from the strong correlation between the two variables causing the switch when the outliers are removed;[14] and (2) GL becomes significant in regressions 1 and 3, but remains insignificant in the regression 5, the primary regression for testing **H1**. Overall, I conclude that my principal findings do not

[14] Pearson (Spearman) correlation between ΔEARN and EARN is 0.149 (0.509), with *p*-value = 0.002 (*p*-value < 0.001).

result from the effect of outliers. I perform similar analysis for **H2-H5**, with all my principal findings holding; these results are not tabulated for brevity.

7.1.5 Estimation of Standard Errors

As I discussed in Section 6.2, my data are heteroskedastic, which violates the normality assumption of OLS regression. I find $\chi^2 = 67.86$ with p-value < 0.0001 for regression 5 of Table 7 using the Breusch-Pagan test for heteroskedasticity. To avoid invalid inferences, I use White's heteroskedasticity-consistent estimator in all regression models. To further ensure my previous inferences are valid, I bootstrap standard errors using 1000 replications to determine standard errors that fit my actual variable distributions. I use block resampling based on the 75 firm clusters in my data. I present **H1** analysis in Table 12, Panel G. I present the clustered standard errors from Table 7, regression 5, to facilitate comparison with the bootstrapped standard error. In most cases, the bootstrapped standard error is similar to, but slightly larger than, the clustered standard errors. However, several notable exceptions emerge: (1) the bootstrapped standard errors for PERM_REVAL are significantly larger than the clustered standard errors; in regression 5, the standard error increases to 0.646 from 0.170, eliminating statistical significance; and (2) the bootstrapped standard errors for EARN are also significantly larger than the clustered standard error, with the regression 5 estimate increasing to 0.198 from 0.082, again eliminating statistical significance. Based on the revised standard errors, the earlier-noted relationships between EARN and ΔCOMP, and PERM_REVAL and ΔCOMP may be artefacts due to violation of OLS assumptions; however, my principal results continue to hold. I repeat testing of **H2-H5** using bootstrapped standard errors with all major findings holding; I again do not tabulate these results for brevity.

7.2 Additional Analysis

7.2.1 Analysis of Revaluations by Firm Type

In this section, I test whether the usefulness of revaluations for stewardship varies by firm type. In particular, I consider two types of firms: investment property 'developers', and investment property 'landlords'. Developers focus on developing properties for the purpose of sale and strategically acquiring existing properties that will increase in value. In contrast, landlords hold properties for the purpose of generating rental income. While I categorize firms to a single category, most firms in reality represent a combination of both, so I seek to categorize based on business emphasis. I expect the importance of FV changes for demonstrating management's stewardship to vary between the two firm types. Specifically, I expect FV changes to provide more useful stewardship information for developers relative to landlords, since investing in properties that increase in value is essential for developers while being less important for landlords. This analysis is related to my testing of sensitivity (**H3**) since developers provide greater opportunity to CEOs to influence revaluations, while landlords provide limited opportunity to CEOs to influence revaluations. Consequently, this analysis builds on **H3** to provide additional insight into greater reward provided when revaluations are more controllable and sensitive to management effort.

To separate firms into developers and landlords, I use rental income relative to investment properties; landlords are expected to have higher relative rental income, while developers are expected to have lower relative rental income. To divide firm-years into developers and landlords, I hand collect gross rental income from company annual reports. Next, I calculate rental income as a percentage of average investment properties held for a given year. Finally, I divide firm-years into two groups using the mean rental income percentage; those firms having greater than average rental income percentage are given a value of RENT_INC = 1 to represent landlords, while firms having less than or equal to average rental income percentage are assigned RENT_INC = 0 to represent developers. Overall, I believe this choice of metric isolates firms that are primarily in the business of rentals versus the firms primarily in the business of development.

By way of example of a landlord firm, Birkby PLC is classified as a landlord for the all three of it firm-years. The Chief Executive's Report in Birkby PLC's 1999 annual report states "Our strategy is to invest solely for income growth" (p. 7), which is consistent with the notion of a landlord firm. Further, the Report of the Remuneration Committee states that the bonus scheme is based on "5 per cent of the amount by which the pre tax profits exceed a target figure" (p. 54). No other bonus performance targets are set. A bonus based on increasing profit is again consistent with the notion of a landlord that is focused on rentals rather than developments. Derwent Valley Holdings PLC qualified as a developer for all ten firm-years in my sample. In the 2002 Report on Directors' Remuneration, performance for the bonus scheme is based on growth in net asset value per share (NAVPS) relative to a peer group. Revaluations form a significant portion of NAVPS change; for 2001, revaluations accounted for £69.2 million of the £71.4 million change in equity. In 2002, negative revaluations of £27.1 exceeded the £21.7 million decrease in equity. This bonus is consistent with the notion of a developer firm that rewards increases in property values. The firm states that "the group has a portfolio balanced between income generation and refurbishment and development opportunities" (p. 1), which is consistent with a firm that emphasizes the importance of property development beyond simply acting as a landlord. Overall, these examples illustrate the differences between landlords and developers in terms of strategy and its link to compensation.

In Table 13, Panels A and B, I tabulate descriptive statistics for developers (i.e. low rental income firms) and landlords (i.e. high rental income firms). I find landlords are consistently smaller than developers, perhaps due to higher capital levels being required for property development. In untabulated analysis, I mean-split firm-years based on size rather than rental income to determine if my results in Panel C (discussed below) stem from size differences rather than firm type; I find no significant difference between the coefficient on REVAL based on firm size suggesting that size differences do not drive my firm type results. I find developers turn over their investment properties at only a slightly greater rate than landlords (17.5% versus 15.6%), which are not statistically distinguishable. In Panel B, I find landlords are generally more weakly governed, which may flow from having inadequate resources due to firm size.

In Table 13, Panel C, I test the relationship between revaluations and compensation for both 128 high rental income firm-years (RENT_INC = 1) and 317 low rental income firm-years (RENT_INC = 0). In columns 1 and 2, I perform separate regressions on each group, while in column 3, I pool observations and include RENT_INC and REVAL ● RENT_INC as explanatory variables. In columns 1 and 2, I find that revaluations are only stewardship-relevant for developers (i.e. low rental income firms); revaluations are not stewardship-relevant for landlords (i.e. high rental income firms). Further, the coefficient estimate on earnings (EARN) is larger at 0.617 for high rental income firms versus 0.219 for low rental income firms, suggesting earnings are more relevant for these firms while revaluations are less relevant; however, in untabulated pooled analysis, EARN interacted with RENT_INC is not significantly positive. Next, in column 3, RENT_INC interacts significantly negatively with REVAL to reduce the stewardship-relevance of revaluations to insignificantly different from zero; an F-test of REVAL + REVAL ● RENT_INC = 0 fails to reject the null (*p*-value = 0.804). Overall, the above testing taken together is consistent with revaluations being more (less) stewardship-relevant for developers (landlords).

7.2.2 Testing Using Total Cash Compensation and Total Compensation

In Section 4.1, I discussed my belief that cash compensation best captures to the notion of management's stewardship since it represents a reward for achieved stewardship. Stock-based compensation may be provided by some firms as a reward for past performance; consequently, I will test whether my key results hold when I use total compensation and total cash compensation rather than cash compensation.

I define total cash compensation in the same way as in Section 3.2 to include salary, bonus, benefits and cash LTIPs. Total compensation includes total cash compensation plus stock LTIPs and stock options. Stock LTIPs and stock options are calculated in the same way as described in Section 3.2. Calculating total cash compensation as a percentage change (ΔTOT_CASH_COMP), consistent with ΔCOMP, gives mean (median) total cash compensation change of 0.200 (0.107), which compares to 0.185 (0.105) for ΔCOMP. Since cash LTIPs are offered only in fifteen firm-years, the differences are slight. Calculating total compensation as a percentage change (ΔTOT_COMP) gives mean (median) total compensation change of 0.228 (0.105). ΔCOMP is strongly correlated with ΔTOT_CASH_COMP (ΔTOT_COMP) at 91.1% (75.5%), both *p*-values significant to greater than 0.0001.

In Table 14, I tabulate regression results using ΔTOT_CASH_COMP and ΔTOT_COMP as dependent variables in my model for testing **H1**. To allow an easier comparison, in column 1, I reproduce regression 5 from Table 7. In column 2, I use ΔTOT_CASH_COMP as the dependent variable. I find comparable results to column 1, with PERM_REVAL losing confidence for 5% to 10% and model explanatory power dropping to 6.6% from 9.5%. The comparable results are unsurprising given the strong correlation noted above. In column 3, I use ΔTOT_COMP as the dependent variable. Again, I find consistent results to column 1, with the exception that PERM_REVAL loses statistical significance. Overall, my primary results are robust to using total cash compensation or total compensation as my dependent variable. In further untabulated testing, I retest **H2** and **H3** using ΔTOT_CASH_COMP and ΔTOT_COMP. All my prior results hold, with the exception that the coefficients on GL_HC and REVAL_ADJ ● CEO_N_COMP fall to 10% confidence from 1% confidence when ΔTOT_COMP is used.

As discussed in Section 4.1, total compensation captures management stewardship over a period of time both before and after compensation is awarded. For example, stock LTIPs are often granted based on several years of performance, but vest contingent on future performance. Further, stewardship can be viewed as a longer-term concept since it is can be difficult to directly associate results to the management effort that generated such results. For example, management effort in the current year may not bring positive results for several years. To apply the concept that total compensation relates to longer-term performance and stewardship may be measured over the longer-term, I perform testing with values over a CEO's tenure with a firm. Specifically, I use average change in total compensation (ΔTOT_COMP_AVE) over a CEO's tenure as the dependent variable. Further, I measure each independent variable as an average over each CEO's tenure. With the above average measures, I am considering what factors affect compensation over the longer term.

In Table 15, I present results for testing averages over each CEO's tenure. In regressions 1 and 2, I provide greater weighting to CEOs who have longer tenure by allowing an observation for each year of tenure beyond the first year (i.e. if a CEO had a 6-year tenure, he/she would have five observations in the regression, with each observation containing equal values of the CEO's average). In regression 1, I do not cluster standard errors by CEO, but do so in regression 2. In regression 1, I find average historical cost gains/losses and revaluations provide explanatory power for management stewardship over a CEO's tenure. When I cluster standard errors by CEO in regression 2, historical cost gains/losses lose statistical significance, while revaluations continue to have explanatory power. In regression 3, I equally weight each CEO, with only one observation representing average values for each CEO included in the regression. Thus, for regression 3, sample size falls to 96 from 445. I continue to find significant explanatory power for average revaluations; however, the model itself has little explanatory power, with R^2 of 0.068 and adjusted R^2 of -0.006.

Overall, the above testing suggests that revaluations provide the best evidence of management stewardship over a CEO's tenure, trumping the information provided by historical cost gains/losses.

7.2.3 Testing of CEO Changes as a Measure for Stewardship

Many standard setting frameworks, such as the current IASB Framework, the proposed IASB/FASB Conceptual Framework exposure draft, and pre-IFRS UK Statement of Principles, specifically identify the decision of whether to reappoint or replace management as a key stewardship-related decision. Consequently, I use CEO changes as a further indirect measure of CEO stewardship. I infer that factors influencing the decision to retain or replace management are stewardship-relevant since management is retained or replaced based on the strength of stewardship. Isolating whether CEO turnover is voluntary or non-voluntary is difficult since many firms allow a CEO the option of resigning rather than being terminated. Consequently, a voluntary CEO retirement may have been initiated by the BOD. Considering the forgoing, I use all CEO changes available in my sample to test what factors influence CEO changes, recognizing that the power of my tests are lessened due to error from including true voluntary changes.

In Table 16, Panel A, I tabulate the full sample and CEO change sample means relative to the year of change. For the full sample, the columns other than Year *t* represent either lags or leads relative to the current year for a given firm. For the CEO change sample, the columns other than Year *t* represent either lags or leads relative to the firm-year of a CEO change. Due to the small number of CEO changes, many mean comparisons between the full sample and the CEO change sample are statistically insignificant. Several means are different with 95% confidence; specifically, earnings in the year of a CEO change and two years after a CEO change are significantly lower than average. Further, revaluations two years prior to a CEO change are significantly lower than average, while revaluations in the year following a CEO change are significantly higher than average.

In Panel B, I use to probit regression model with CEO change as the dependent variable (CEO_CHG). Since CEO_CHG is assigned a value of 1 is a CEO changed in a given firm-year, predicted signs are reversed from the **H1** analysis. For example, positive earnings are expected to help a CEO get reappointed, thus the predicted sign is negative. Since I expect the decision to replace management is done over a period of several years, I perform analysis using regression variables measured for: (1) the change year (column 1); (2) the year prior to the change year (column 2); (3) the average of the two years prior to the change year (column 3); and (4) the average of the change year and the two years prior to the change year (column 4). In column 1, using only the change year, only REVAL achieves marginal significance (one-tailed p-value < 0.10), weakly suggesting that revaluations in the CEO change year influence the change decision. Overall, the model in column 1 poorly predicts CEO changes with a likelihood ratio test providing little support for model fit (p-value = 0.48). In column 2, using the year prior to the change, stock returns weakly explain the decision to replace management (one-tailed p-value < 0.10), with the model continuing to perform poorly (likelihood ratio p-value = 0.34). In column 3, using the two years prior to the change, revaluations have significant explanatory power for CEO changes (one-tailed p-value < 0.01), with improved model fit (likelihood ratio p-value = 0.02). In column 4, using the current year and two years prior to the change, the model fit continues to improve, albeit marginally (likelihood ratio p-value = 0.01). Consistent with column 3, revaluations have significant explanatory power for CEO changes (one-tailed p-value < 0.01).

I interpret the above to suggest that BODs use revaluation information when making the decision to retain or replace management, illustrating the stewardship-relevance of revaluation information. The noted stewardship-relevance reinforces my earlier findings using CEO compensation as a measure for stewardship. For CEO changes, the past revaluations realized upon sale of investment properties

(GL_HC) do not provide significant explanatory power. The lack of explanatory power may stem from the ability of a CEO to avoid selling properties that would result in losses or weak gains, while revaluations occur regardless of whether a CEO avoids a sale decision, potentially resulting in better stewardship information on which to base a retain or replace decision. My results for CEO changes should be interpreted with caution due to the limited number of CEO changes I observe; however, these results, taken in conjunction with my earlier results, provide strong support for the stewardship-usefulness of FV changes.

7.2.4 Rolling Averages of Independent Variables

In my analysis to this point, I have assumed that the assessment of management's stewardship occurs over a one-year period and each year's assessment is independent. In this section, I consider whether compensation committees may use a longer window than a single year to assess stewardship. When considering management stewardship, I believe it is reasonable that compensation committees may consider more than the current year to assess stewardship, which involves assessing how well management has safeguarded firm resources and put them to effective and efficient use. In my context, real estate investments may take several years to develop or to experience favourable value changes. Overall, I assess whether compensation committees use longer time horizons of performance to assess stewardship.

To test whether longer time horizons are used, I calculate rolling averages of all explanatory variables over 2-, 3-, and 4-year windows. I only include observations that have the minimum number of required years of data; consequently, my sample size decreases as the window increases. See Table 17 for the results of re-estimating model (1) using rolling averages. As the rolling average window increases from 2 to 4 years, the explanatory power of the model decreases from 9.5% to 6.4%. The decrease in explanatory power may be caused by stewardship being less captured by longer windows, it may be caused by differing sample composition of annual regressions (445 observations) versus rolling average regressions (349, 265, and 203 observations for 2-, 3-, and 4-year rolling averages respectively), or it may be caused by increased noise in the smaller samples. The coefficient on REVAL, my principal variable of interest, varies little from the annual regression estimate of 0.374, with coefficient estimates of 0.433, 0.400, and 0.362 for 2-, 3-, and 4-year rolling averages respectively, with the 4-year rolling average losing statistical significance. For GL_HC, the coefficient estimates of 1.411, 1.919, and 2.215 for 2-, 3-, and 4-year rolling averages respectively are higher than the annual regression estimate of 0.905; however, the differences may stem from changes in sample composition. The usefulness of EARN for stewardship decreases as the window increases, suggesting that earnings are assessed over a shorter window than FV changes. Further, rolling averages of PERM_REVAL are not used for stewardship; if used, they are considered on a year-specific basis only. Overall, I conclude the usefulness of revaluations for stewardship extends to considering a rolling average of 2 and 3 years , but the magnitude of the reward does not appear to differ from annual revaluations.

Since I am using rolling averages of independent variables, the risk that observations are not independent increases. Consequently, I re-estimate Table 17 using Prais-Winston regression and Newey-West standard errors; my above conclusions remain unchanged.

7.2.5 Industry-Adjusted Revaluations

To this point, I have considered revaluations in total, implicitly assuming that the expectation for revaluations is zero and any deviations from zero should be rewarded or punished. In this section, I calculate revaluations that are adjusted for the average real return on UK commercial real estate.[15] Since average returns are expressed in real returns, I first calculate real revaluations by subtracting annual inflation from revaluations expressed as a percentage of the beginning-of-year investment property balance.[16] In Table 18, Panel A, I compare the real investment capital growth in my sample to that experienced by commercial property in the UK to determine whether my sample firms are representative of the industry. Generally, the real returns in my sample are similar to those experienced by the industry, although I do not expect returns to be precisely the same because many sample firms hold some properties outside of the UK. In panel B, I correlate the sample returns to the industry returns and find Pearson (Spearman) correlations of 68.1% (65.7%), suggesting my firms are representative of the industry and industry returns provide a solid benchmark against which to gauge CEO stewardship.

In Panel C, I re-estimate regressions 4 and 5 from Table 6 using industry-adjusted revaluations rather than raw revaluations. Specifically, I reduce actual revaluations by inflation and the average industry return for that specific year. Next, I scale the revised industry-adjusted revaluations by beginning-of year market value to be consistent with the scaling of other explanatory variables. When I re-estimate regression 5 from Table 6 (shown in regression 2 in Panel C), adjusted R^2 increases to 12.2% from 9.5%, suggesting industry-adjusted revaluations (REVAL_ADJ) have greater explanatory power than raw revaluations. REVAL continue to be significantly positively related to ΔCOMP, suggesting FV changes are stewardship relevant. The realization of revaluations through final sale (GL_HC) continues to be rewarded by compensation committees even with REVAL_ADJ in the regression. With REVAL_ADJ, ΔEARN is relevant from stewardship while EARN is not, which may be due to correlation between ΔEARN and EARN, and PERM_REVAL loses explanatory for compensation changes. Overall,

[15] Annual capital growth for UK commercial real estate is obtained from the IPD UK Annual Property Index (http://www.ipd.com/OurProducts/Indices/UnitedKingdom/UKAnnual/tabid/973/Default.aspx).
[16] Annual UK inflation is taken from a UK government website that provides time series data for the CPI (Consumer Price Index) (http://www.statistics.gov.uk/statbase/tsdtables1.asp?vlnk=mm23).

industry-adjusted revaluations are useful for assessing management's stewardship, but the realization of those revaluations through final sale continues to be stewardship-relevant.

7.2.6 Categories of Governance Strength

Ideally, I would have an objective and comprehensive measure of each firm's corporate governance strength that I could use to assess the interactive effect of governance and revaluations on CEO cash compensation; however, no such measure exists. Thus, I am forced to use various proxies to assess governance strength. In this section, I divide firms into low, moderate, and high governance strength to assess how coefficient estimates differ across these categories.

To form three categories of governance strength, I use the two strongest measures of corporate governance available, specifically, BOD independence and the CEO not acting as chairman. I avoid using BOD size since it is negatively related to the other governance measures, which suggests findings in the literature about BOD size may not apply in my sample. Further, I avoid using the CEO not serving on the compensation committee since this holds true for 89.9% of observations, not allowing a meaningful split across categories. I assign firm-years to the 'low' governance category if both IND = 0 and CEO_N_CHAIR = 0, meaning these firms have below median BOD independence and the CEO acting as chairman. Next, I assign firm-years to the 'high' governance category when both IND = 1 and CEO_N_CHAIR = 1, meaning these firms have above median BOD independence and the CEO *not* acting as chairman. All remaining firm-years are assigned to the category of 'moderate'. The above assignment gives 89, 218, and 138 firm-years in the low, moderate, and high governance categories respectively.

In Table 19, I re-estimate model (1) for each governance category. I do not cluster standard errors by firm in these regressions due to smaller sample sizes relative to the number of firms. I observe a number of patterns across the governance categories. First, low governance firms reward earnings, while high governance firms reward earnings changes, suggesting the performance targets are zero and prior year earnings for low and high governance firms respectively. Since losses are rarely experienced by sample firms, prior year earnings would appear to be a target more reflective of CEO performance. Second, I observe inverse patterns for GL_HC and REVAL. In low governance firms, annual revaluations (REVAL) are not rewarded, while realized FV gains/losses (GL_HC) are rewarded to a large extent. In high governance, I observe the opposite; annual revaluations are rewarded to a large extent, while realized FV gains/losses are not rewarded to a statistically significant extent. I interpret the preceding as follows: low governance firms have little confidence in annual revaluations, so they reward FV changes only when realized through actual sale. In other words, the reward for FV changes is fully held back until final sale. High governance firms have strong confidence in annual revaluations so they are rewarded to a large extent, with little or no reward held back until realization of those FV changes. Moderate governance firms reward annual revaluations, but hold back some of the reward until actual realization. No individual governance category punishes for permanent write-downs, which may be caused by weak testing power due to infrequent write-downs. Overall, the regressions are consistent with the notion that revaluations are more objective and verifiable when corporate governance is strong.

7.2.7 Factor and Principal Components Analysis of Governance Variables

In this section, I isolate the common governance factor from my four governance measures to further test the influence of governance on the extent to which revaluations are used for stewardship. I identify factors in two ways. First, I use maximum likelihood factor analysis; second, I use principal components analysis. Table 20, Panel A, lists the factor loadings for these two methods. Both methods identify only one factor with an eigenvalue greater than 1. BOD independence (IND) retains the most uniqueness (0.94 and 0.82 for factor and principal components analysis respectively), meaning that the governance factor captures the least information about this variable. As expected due to its negative correlation with the other governance variables, BOD size (BOD_SMALL) loads negatively using both methods.

Table 20, Panel B, tabulates the results of re-estimating model (2) using the identified governance factor (GOV). With GOV measured both using factor analysis and principal components analysis, the same interpretation emerges: governance strength interacts with revaluations (REVAL) to make those revaluations more useful for stewardship, providing additional support for **H2c**. Nevertheless, revaluations continue to have independent explanatory power for stewardship. Governance explains from 31.3% to 43.8% of the impact of revaluations on changes in CEO cash compensation. Consistent with previous regressions, EARN, GL_HC, and PERM_REVAL continue to be used for stewardship. In untabulated analysis, I find that GOV does not interact with realized FV gains/losses (GL_HC) (*p*-value = 0.699), which is expected since measurement error does not affect GL_HC, as it is calculated based on realized transactions. Overall, the preceding provides evidence that strong governance results in better FV estimates that are then more useful for assessing management's stewardship.

7.2.8 Factor and Principal Components Analysis of Factors Affecting Objectivity and Verifiability of Revaluations

The analysis in the previous section considered only the influence of governance on the use of revaluations for stewardship; in this section, I extend factor analysis to include all factors affecting objectivity and verifiability of FV estimates. Specifically, I perform maximum likelihood factor analysis and principal components analysis on: external appraisals (EXT), Big N auditor (BIGN), BOD independence (IND), CEO not acting as chairman (CEO_N_CHAIR), BOD size (BOD_SMALL), CEO not serving on compensation committee (CEO_N_COMP), and estimation bias (BIAS). I modify BIAS to assign a value of zero to missing values to allow the use of all observations in regression analysis.[17]

In Table 21, Panel A, I tabulate the results for performing factor and principal components analysis on the above variables. Maximum likelihood factor analysis identifies two factors with eigenvalues > 1, which I label as OV1 and OV2. BIGN and IND load on the first factor, which I describe as the 'oversight' factor, since it includes auditor strength and BOD independence. CEO_N_CHAIR, BOD_SMALL, and CEO_N_COMP load on the second factor, which I describe as the 'CEO power' factor, since it includes the influence that the CEO has over the BOD (i.e. a CEO as chairman or on the compensation committee or as a member of a smaller board will carry more influence). Neither EXT nor BIAS load to any meaningful extent.

Using principal components analysis, I identify three factors with eigenvalues > 1, which I label as OV1, OV2, and OV3. OV1 represents 'CEO power' and OV2 represents 'oversight' as described in the previous paragraph. EXT and BIAS load on the third factor OV3, which I describe as 'estimate quality' since it includes external scrutiny of FV estimates and reduced estimate bias.

In Panel B, I re-estimate model (2) using the above-identified factors. Model (2) is modified to include separate regressors for each factor and the interaction of each factor with revaluations. The oversight factor (OV1 under factor analysis and OV2 under principal components analysis) does not interact to make revaluations (REVAL) more useful for stewardship; however, it does have a significant negative association with ΔCOMP, which suggests that strong oversight leads to slower growing CEO compensation or more mature firms with slower growing compensation have stronger oversight. The CEO power factor (OV2 under factor analysis and OV1 under principal components analysis) interacts to makes revaluations more heavily weighted for stewardship, meaning that when CEO power is high (low),

[17] BIAS carries a value of missing when no investment properties are sold in a given year or if the investment properties represent < 1% of opening investment properties.

FV estimates are less (more) heavily weighted for compensation. I interpret the change in weighting to result for FV estimates being more objective and verifiable when the CEO has less power. Under principal components analysis, the estimate quality factor (OV3) also interacts with revaluations to increase the association with compensation changes, again supporting the notion that more objective and verifiable FV estimates are more useful for assessing management's stewardship. Even with the additional factors, realized FV changes (GL_HC) continues to be associated with ΔCOMP, suggesting that compensation committees hold back some of the compensation benefit of FV changes until realization, even when CEO power is low and estimate quality is high.

7.2.9 Analysis of Positive and Negative Revaluations

In this section, I allow the slope to vary for positive and negative revaluations to provide insight into how compensation committees reward and punish CEOs based on revaluations. I re-estimate model (1) while including an indicator variable for negative revaluations (NEG) and an interaction term between REVAL and NEG. NEG is assigned a value of 1 if the revaluation for a firm-year is negative and zero otherwise. In Table 22, I perform analysis using both actual revaluations (REVAL) in column 1 and industry-adjusted real revaluations (REVAL_ADJ) in column 2. I believe the industry-adjusted revaluations provide a stronger reference point for calculating positive/negative returns since real estate firms do not compete against and try to exceed a benchmark of zero, they compete against and try to exceed the benchmark of the average industry return. Nevertheless, I present analysis for both definitions of negative revaluations.

In column 1, 85 firm-year observations have negative revaluations and are assigned NEG = 1. For firms with positive revaluations, I observe a coefficient similar to regression 5 of Table 6 (0.397 versus 0.374 in Table 6). Since the coefficient on NEG is not significantly different from 0 (*p*-value = 0.56), I infer that CEOs experiencing negative revaluations do not receive reduced compensation increases as a direct result. The coefficient on the interaction term (REVAL ● NEG) is negative, but not measured with much precision (p-value = 0.54), perhaps due to weak testing power stemming from having only 85 negative observations. The negative coefficient suggests that negative revaluations are punished to a lesser relative extent than positive revaluations are rewarded. In fact, the sum of REVAL + REVAL ● NEG is not significantly different than 0 using an F-test (p-value = 0.87), suggesting perhaps that negative revaluations are not at all punished through reduced compensation increases; however, low testing power prevents me from making a definitive conclusion.

In column 2, 299 firm-years observations have negative revaluations relative to the industry average for commercial property firms in the UK and are assigned NEG = 1. First, I note that using industry-adjusted returns provides better explanatory power for ΔCOMP with adjusted R^2 = 13.1% versus 9.2% for actual revaluations, indicating industry-adjusted revaluations provide more useful information about management's stewardship. Next, I note a significantly negative association between NEG and ΔCOMP of -0.069 (p-value < 0.05), which suggests that CEOs underperforming the industry for growth in investment property FVs receive compensation increases that are 6.9% lower on average. Finally, I note the coefficient on REVAL_ADJ ● NEG is negative and significant, suggesting that positive revaluations are rewarded to a greater extent than negative revaluations are punished. While REVAL_ADJ is significantly different from 0, for the sum of REVAL_ADJ + REVAL_ADJ ● NEG, I cannot reject the null that they total 0, meaning that I cannot conclude negative revaluations are actually punished corresponding to magnitude. Overall, I interpret the results in column 2 for revaluations as follows: CEOs receive a reward for beating the industry benchmark that is increasing in how much the benchmark is exceeded. CEOs are also punished for underperforming the industry, but receive a flat punishment regardless of the magnitude of underperformance.

7.2.10 Estimation of Cash Compensation Levels Model

To increase confidence that my primary results are not simply artefacts stemming from research design choices, I complete analysis using an alternative model specification using CEO cash compensation *levels* (COMP), rather than changes, as the dependent variable. All other previously defined regression variables remain unchanged. Since my regression seeks to explain compensation levels, I include additional explanatory variables expected to be associated with levels, but not changes. Specifically, I add the following variables: (1) SIZE - calculated as the natural log of total assets, since larger firms generally pay CEOs more due to greater responsibility and job complexity; (2) RISK - calculated as the variance of daily stock returns, since firm risk leads to employment risk for the CEO; (3) DE - calculated as total debt to equity ratio, since default risk increases the chance of a CEO being subject to litigation; (4) TENURE - assigned a value of 1 if the CEO's years of tenure are > the sample mean of 7.3 years and 0 otherwise, since more experienced CEOs are expected to earn higher compensation; and (5) MTOB - calculated as market value / book value of equity, since growth firms are expected to be more challenging to manage, requiring higher compensation.[18]

In Table 23, Panel A, I tabulate descriptive statistics for the additional regression variables. The revised dependent variable, COMP, is much more normally distributed than ΔCOMP; in fact, I cannot reject the null of no heteroskedasticity using the Breusch-Pagan test for regression 5 in Panel B. Nevertheless, I continue to use White's heteroskedasticity estimator in Panel B's regressions.

In Panel B, I produce the results from estimating the revised model for testing **H1**. Of the additional explanatory variables, SIZE, TENURE, and MTOB demonstrate strong positive associations with COMP. DE also generally demonstrates a positive association, while I find RISK is not associated. Realized FV gains/losses (GL_HC) are significantly positively associated with compensation, with the inclusion of

[18] To calculate COMP, I use the natural log of compensation expressed in thousands. For SIZE, I use the natural log of total assets expressed in millions. RISK is multiplied by 1,000 to avoid small coefficient estimates.

GL_HC in regression 2 increasing explanatory power more than chance to 91.9% confidence (*p*-value = 0.081). From regression 3, I observe revaluations help to explain compensation with *p*-value < 0.05 and add explanatory power to the model with > 95% confidence. In regressions 4 and 5, both GL_HC and REVAL continue to be significantly positively associated with COMP. In the levels regressions, none of earnings changes (ΔEARN), earnings (EARN), nor stock returns (RET) demonstrate association with compensation. RET may lose significance in this model due to strong correlation with MTOB (Pearson (Spearman) correlation of 41.6% (44.3%)), but the lack of association with earnings is puzzling. Overall, I conclude my principal results continue to hold in this alternative specification using compensation levels, providing additional support for **H1**.

7.2.11 Modeling Endogenous Choice of Factors Affecting Objectivity and Verifiability

Potential exists in my study for factors affecting objectivity and verifiability to be determined in conjunction with the decision to reward revaluations. For example, a small firm may choose to avoid using external appraisers due to non-complex properties and a desire to reduce costs; simultaneously, the firm may avoid using revaluations to compensate management due to lack of external appraisal. In this case, the avoidance of using revaluations for compensation purposes is jointly determined with the decision to not use an external appraiser. If this example holds true more generally, my earlier finding that internally-appraised revaluations are not stewardship relevant stems from this joint determination. More specifically, small firms avoid both external appraisers and rewarding revaluation changes, meaning that my earlier findings are due to firm size, rather than internal revaluations being less stewardship relevant. To reduce the potential that such firm characteristics influenced my earlier results for **H2**, I implement an endogenous switching regression model.

The endogenous switching regression model simultaneously estimates using maximum likelihood a selection equation for the factor affecting objectivity and verifiability, and equations for when the factor equals zero and when the factor equals one. The switching model adjusts for the non-random selection of various factors by firms, which should correct any selection bias affecting ordinary-least squares regression coefficients. I choose the switching model since I am interested in the effects of selection on the extent to which revaluations are used for compensation, not the direct effect of selection on compensation. The Heckman (1979) procedure is not suitable since I must use both the selection variable and the selection variable interacted with revaluations in the second-stage of the regression.

To implement the switching model, I identify instruments that affect the selection of objectivity and verifiability factors, but have no direct effect upon compensation changes. I use instruments that Muller and Riedl (2002) find affect the choice of Big N auditor and/or external appraisers. Specifically, I include: (1) firm size (SIZE), calculated as the natural logarithm of total assets, which is expected to influence choice since firm size proxies for complexity and the availability of firm resources; (2) debt to equity ratio (DE), calculated as total debt divided by total equity, which proxies for a firm's bankruptcy risk and is expected to motivate a firm to demonstrate quality and transparency; (3) variance of daily stock returns (RISK), calculated as the variance of a firm's daily stock returns for each fiscal year, which is also expected to motivate a firm to demonstrate quality and transparency; (4) BOD insider stock holdings (INSIDER_HOLD), calculated as the percentage of outstanding stock held by BOD insiders, which is consistent with higher monitoring providing less benefit to insiders when their stock holdings are high; and (5) secured debt (SD), calculated by secured debt as a percentage of total assets, which represents pressure from debt holders to increase monitoring and governance quality. To validate the independence of the above instruments from compensation changes, I perform a Sargan overidentification test for each objectivity/verifiability factor and include the test statistics and *p*-values in each panel of

Table 24. For all Sargan tests, I do not reject the null of no error correlation, validating the independence of my chosen instruments.

In addition, I include all regression variables from the compensation equation in the selection model. Since the switching model relies on joint normality of the error terms across all three equations, I measure my dependent variable as the change in the natural logarithm of cash compensation from the prior year to the current year, which gives a dependent variable that is much more normally distributed [mean (median) for LN(COMPCHG) are 0.134 (0.100) versus 0.185 (0.105) for COMPCHG]. Since all of the objectivity and verifiability factors may be influenced by joint determination, I complete the switching model for all tests of **H2**.

Table 24 presents the results for applying the switching model. In Panel A, I present the results for testing external appraisals. SIZE has a significant impact on the external appraisal choice, but no other instruments achieve significance. EARN also influences the external appraiser choice, presumably due to more profitable firms being better able to afford the cost. The Wald test does not reject the null of non-independent equations, which suggests that selection does not influence the compensation equations. REVAL continues to be significantly higher when external appraisers are present (one-tailed *p*-value = 0.017); further, REVAL is not significantly different from zero for internal appraisals, consistent with my earlier findings.

In Panel B, I present the results for testing Big N auditor. Due to collinearity (i.e. some years having all observations in one regime), I exclude year dummies. Consistent with EXT, of the instruments, only SIZE influences the choice to use a Big N auditor. For the influence of BIGN, I find comparable results to EXT; specifically, selection does not play a significant role (Wald test *p*-value = 0.526), the coefficient on REVAL is significantly higher when a Big N auditor is used (one-tailed *p*-value = 0.028), and

REVALs are only used when a Big N auditor is present. These findings are consistent, but slighter stronger than, my earlier findings.

In Panels C through F, I present the results for testing the four governance variables: BOD independence (IND), CEO not acting as chairman (CEO_N_CHAIR), small BOD size (BOD_SMALL), and the CEO not serving on the compensation committee (CEO_N_COMP). In panel C, I find DE and INSIDER_HOLD influence BOD independence. While choice does not appear to have a significant influence (Wald test *p*-value = 0.188), the difference between REVAL when a BOD is more independent (IND = 1) and when a BOD is less independent (IND = 0) loses significance to conventional levels (one-tailed *p*-value = 0.151), even though the coefficient estimate when IND = 1 is nearly double than when IND = 0 (0.362 versus 0.205). These results are weaker than my earlier findings, suggesting other factors, notably DE and INSIDER_HOLD, may influence both the choice of BOD independence and the use of revaluations for compensation.

In Panel D, I test the selection of the CEO not acting as chairman (CEO_N_CHAIR). Of the instruments, I find RISK affects the choice. Further, both core earnings (EARN) and GL affect the CEO not acting as chairman, perhaps due to more profitable firms have more financial resources to split the roles. While selection appears to be significant for CEO_N_CHAIR (Wald test *p*-value < 0.0001), the coefficient on REVAL is significantly higher when the CEO does not act as chair (one-tailed *p*-value = 0.0001), which supports my earlier findings. Year dummies are excluded to allow convergence of a solution.

In Panel E, I test the selection of BOD size (BOD_SMALL), with smaller BODs assigned a value of 1 to indicate a BOD expected to be more effective. SIZE is negatively related to BOD_SMALL suggesting larger firms have larger BODs. Further, DE is weakly related to BOD_SMALL, suggesting more-levered firms have smaller BODS. Finally, INSIDER_HOLD is positively related to BOD_SMALL, suggesting more closely-held firms have smaller BODs. Nevertheless, selection is not found to influence the compensation equation (Wald test *p*-value = 0.123). Consistent with earlier results, I find no statistical difference for REVAL based on BOD size (one-tailed *p*-value = 0.791).

In Panel F, I test the selection of the CEO not serving on the compensation committee (CEO_N_COMP). To avoid collinearity, I exclude year dummies. I find SD and SIZE (weakly) influence the choice of the CEO_N_COMP, but selection does not influence the compensation equation (Wald test *p*-value = 0.741). Consistent with earlier results, I find the coefficient on REVAL is significantly larger when governance is stronger (i.e. the CEO does not serve on the compensation committee).

In Panel G, I test whether low estimation bias (BIAS_LOW) results are influenced by selection. None of the instruments influence the estimation BIAS, and the other regression coefficients only demonstrate several weak influences (ΔEARN, EARN, GL_HC, and PERM_REVAL). REVAL continues to be insignificantly different whether BIAS is high or low (one-tailed *p*-value = 0.446), perhaps indicating a weak proxy for estimation bias.

Based on the results in Table 24, I believe that non-random selection of the factors affecting objectivity and verifiability has minimal impact on the results presented earlier. Only the governance variable BOD independence was affected, with confidence of REVAL difference between regimes falling to approximately 85% from greater than 95%. While selection bias can never be entirely ruled out, I believe the use of the switching model and five instrumental variables significantly reduces the risk of endogeneity.

Chapter 8
Conclusion

This study investigates the stewardship-relevance of investment property revaluations for a sample of UK real estate firms from 1994-2005. Prior to IFRS adoption for years beginning after January 1, 2005, the UK largely maintained a parallel FV and HC system, with revaluations recorded in equity and incremental HC gains/losses reflected in a supplementary financial statement, providing an opportunity for testing which system provides superior stewardship information. With stewardship recognized as a primary financial reporting objective and a continuing emphasis on FV accounting, my study provides evidence that FVs provide useful stewardship information when they are supported by consistent external appraisals to increase estimate reliability. Further, I find HCs continue to provide information that is useful for stewardship beyond FVs. Thus, I conclude that while FVs are rewarded, compensation committees hold back the full reward until the FV changes are actually realized. This finding contrasts the valuation literature, which finds HCs are no longer value-relevant once FVs are included. Overall, I provide evidence that FVs can be adequately reliable for stewardship purposes with external appraisals, countering the belief that FV changes contain too much measurement error to be used for such a purpose. However, the stewardship-usefulness of FVs increases when the estimates are of higher quality or when FV changes are more sensitive to the efforts of management. These findings extend the traditional compensation concepts of noise and sensitivity to FVs. Further, these findings support the notion that estimates must be hard to be useful for stewardship.

I believe that my dissertation provides evidence to standard setters, particularly the FASB and IASB, that the concepts of stewardship and FV and not orthogonal; however, unlike the valuation objective, HCs continue to provide useful stewardship information with FVs present. I conclude that the stewardship objective would be best served by an accounting system that includes both FVs and HCs, which is inconsistent with IAS 40 that does not disclose HCs if a FV model is chosen.

My dissertation is subject to several important limitations. First, I use UK real estate firms due to their unique accounting for investment properties; however, compensation contracting differs across countries and thus my results may not extend to all countries. Further, I use investment property revaluations for a measure of FV accounting. While investment properties are not exchange-traded instrument, some homogeneity exists for various classes of investment properties and formal valuation guidelines exist, thus my findings may not extend to FVs that contain greater measurement uncertainty.

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Figure 1

Accounting for Investment Properties

Under UK GAAP, annual changes in fair value of investment properties, termed revaluations, are recorded in the revaluation reserve, a component of shareholders' equity, and in a separate financial statement, entitled "Statement of Total Recognized Gains and Losses". Revaluations deemed to be permanent decreases in value are recorded in the income statement. Investment property historical costs are disclosed. When investment properties are sold, the difference between proceeds and the most recent fair value is recognized in the income statement. In addition, the difference between the recognized fair value gain/loss and the gain/loss that would have been recognized under historical costs is recognized in a separate financial statement, entitled "Note of Historical Costs Profits and Losses".

Example 1:
An investment property is acquired in 1998 for £10 million. In 1999, the property is externally appraised at £14 million. In 2000, the property is externally appraised at £12 million. In 2001, the property is sold for £13 million.

	Fair Value			Historical Cost		
Year	Balance Sheet - Inv. Prop.	Balance Sheet - Reval. Reserve	Income Statement	Balance Sheet - Inv. Prop.	Balance Sheet - Reval. Reserve	Income Statement
1998	£10	-	-	£10	-	-
1999	+£4 (a) £14	+£4 (a) £4	-	£10	-	-
2000	-£2 (a) £12	-£2 (a) £2	-	£10	-	-
2001	-£13 -	-£2 (b) -	£1 (c)	-£10 -	-	£3 (d)

In Example 1, (a) represents the annual revaluation (REVAL in Table 2). The recognized gain/loss on sale (GL in Table 2) is represented by (c). The additional gain/loss that would have been recognized under historical cost accounting (GL_HC in Table 2) is represented by (b) multiplied by -1. The total gain/loss if historical cost accounting were used is represented by (d) and is the sum of (b) multiplied by -1 and (c).

Example 2:
An investment property is acquired in 2000 for £25 million. In 2001, the property is externally appraised at £23 million. In 2002, the property is externally appraised at £18 million, with £2 million of the decrease in value deemed to be permanent. In 2003, the property is sold for £15 million.

	Fair Value			Historical Cost		
Year	Balance Sheet - Inv. Prop.	Balance Sheet - Reval. Reserve	Income Statement	Balance Sheet - Inv. Prop.	Balance Sheet - Reval. Reserve	Income Statement
2000	£25	-	-	£25	-	-
2001	-£2 (a) £23	-£2 (a) -£2	-	£25	-	-
2002	-£5 (a) £18	-£3 (a) -£5	-£2 (e)	-£2 (a) £23	-	-£2 (e)
2003	-£18 -	+£5 (b) -	-£3 (c)	-£23 -	-	-£8 (d)

In Example 2, (a) represents the annual revaluation (REVAL in Table 2). The permanent impairment in value is represented by (e) above (PERM_REVAL in Table 2). The recognized gain/loss on sale (GL in Table 2) is represented by (c). The additional gain/loss that would have been recognized under historical cost accounting (GL_HC in Table 2) is represented by (b) multiplied by -1. The total gain/loss if historical cost accounting were used is represented by (d) and is the sum of (b) multiplied by -1 and (c).

Table 1

Components of Compensation

Panel A: Compensation components descriptives (in £ thousands except N)

Component	N	Mean	Std. dev.	Min	Q1	Median	Q3	Max
Salary	445	229.101	133.674	44.000	130.000	200.000	288.000	1,000.000
Bonus	445	103.982	197.780	0	0	39.000	140.000	2,000.000
Other	445	16.315	10.518	0	10.000	15.000	20.396	71.000
LTIP (cash)	445	10.555	93.436	0	0	0	0	1,444.292
LTIP (stock)	445	31.200	121.107	0	0	0	0	1,123.260
Stock options	445	26.987	83.600	0	0	0	12.772	754.970

Panel B: Additional statistics (mean and median in £ thousands)

Component	% of mean total compensation	N (non-zero)	Mean (when non-zero)	Median (when non-zero)
Salary	54.8%	445	229.101	200.000
Bonus	24.9%	296	156.325	103.000
Other	3.9%	428	16.964	15.000
LTIP (cash)	2.5%	15	313.133	98.029
LTIP (stock)	7.4%	69	201.215	106.599
Stock options	6.4%	148	81.144	35.166

Panel C: Compensation means and medians (in £ thousands)

Definition	Mean
Cash compensation (salary + bonus + other)	349.308
Total cash compensation (salary + bonus + other + LTIP (cash))	359.863
Total compensation (salary + bonus + other + LTIP (cash) + LTIP (stock) + stock options	418.050

Table 2

Sample Firms

Panel A: Sample selection	Firms	Observations
Initial firms selected had the following characteristics:		
– Listed as UK firms in Datastream		
– In Datastream sector "Real Estate Investment & Services" or "REIT" at time of collection		
– Trades on the main market of the London Stock Exchange		
– Minimum of two years of data available on Datastream		
– Minimum of two years of annual reports available either on company website or through Companies House (UK)		
– Detailed compensation data is disclosed		
– Firm has > 0 investment properties carried at FV		
Initial sample	82	633
Additional screens:		
– To calculate changes, drop the initial year of data for each firm	-	(82)
– When CEO's change, drop the first year of data for the new CEO	-	(36)
– Drop observations when opening market value is missing	-	(3)
– Drop observations where investment properties are less than 50% of total assets	(7)	(67)
Final sample	75	445

Panel B: Number of observations by year	Observations
1994	4
1995	30
1996	56
1997	57
1998	56
1999	53
2000	43
2001	35
2002	36
2003	34
2004	28
2005	13
Total	445

Panel C: Number of firms for each observation quantity	Firms
1	3
2	9
3	6
4	11
5	7
6	6
7	4
8	10
9	10
10	6
11	3
Total	75

Table 3

Definition of Variables

$\Delta COMP_{i,t}$	The percentage change from year *t*-1 to *t* in the cash compensation (comprised of salary + bonus + benefits) for firm *i*'s CEO. The CEO either has the title of Chief Executive or is the highest paid executive director (if no director has the title Chief Executive).
$\Delta EARN_{i,t}$	The change from year *t*-1 to *t* in earnings after tax, excluding gains/losses on sales of investment properties ($GL_{i,t}$), and permanent investment property revaluations ($PERM\_REVAL_{i,t}$) for firm *i*, deflated by the market value of equity at the beginning of year *t*.
$EARN_{i,t}$	The earnings after tax, excluding gains/losses on sales of investment properties ($GL_{i,t}$), and permanent investment property revaluations ($PERM\_REVAL_{i,t}$) for firm *i* in year *t*, deflated by the market value of equity at the beginning of year *t*.
$RET_{i,t}$	The total stock market return, including dividends, for firm *i* in year *t*.
$GL\_HC_{i,t}$	The amount of investment property revaluations, recorded prior to year *t*, that are realized through sales of investment properties for firm *i* in year *t*, deflated by the market value of equity at the beginning of year *t*. If firm *i* had no investment property sales in year *t*, GL_HC is recorded as 0.
$PERM\_REVAL_{i,t}$	The permanent impairments in the value of investment properties for firm *i* in year *t*, deflated by the market value of equity at the beginning of year *t*. If firm *i* had no permanent impairments recorded in year *t*, PERM_REVAL is recorded as 0.
$GL_{i,t}$	The gain/loss on sale of investment properties for firm *i* in year *t*, which represents the difference between the prior year fair value assessment and sale proceeds, deflated by the market value of equity at the beginning of year *t*. If firm *i* had no investment property sales in year *t*, GL is recorded as 0.
$REVAL_{i,t}$	The revaluations of investment properties for firm *i* in year *t*, deflated by the market value of equity at the beginning of year *t*.
$YEAR_{t}$	A vector of year-specific indicator variables.
EXT_{i}	Takes a value of 1 if firm *i*: (1) used external appraisers for all sample years; and (2) the external appraisal in each year covered > 90%of investment properties; and 0 otherwise.
$BIGN_{i,t}$	Takes a value of 1 if firm *i*'s auditor in year *t* was: KPMG; Deloitte & Touche; PricewaterhouseCoopers, including predecessor firms of Price Waterhouse and Coopers & Lybrand; Ernst & Young; or Arthur Andersen; and 0 otherwise.
$IND_{i,t}$	Takes a value of 1 if firm *i* had greater than the median percentage of independent directors in year *t*, and 0 otherwise.
$CEO\_N\_CHAIR_{i,t}$	Takes a value of 1 if firm *i*'s CEO was *not* the Chairman in year *t*, and 0 otherwise.
$BOD\_SMALL_{i,t}$	Takes a value of 1 if firm *i* had less than the median number of directors in year *t*, and 0 otherwise.
$CEO\_N\_COMP_{i,t}$	Takes a value of 1 if firm *i*'s CEO was *not* a member of the compensation committee of the BOD in year *t*, and 0 otherwise.
$BIAS\_LOW_{i,t}$	Takes a value of 0 if the absolute value of gains/losses on sales of investment properties, adjusted for value changes prior to sale, for firm *i* in year *t*, expressed as a percentage of disposals, is greater than the average absolute difference for the industry for that year. BIAS_LOW is only calculated when disposals in year *t* represent > 1% of beginning-of-year investment properties.
$ADD_{i,t}$	Net additions (i.e. additions less disposals) to investment properties, including acquisitions, as a percentage of opening investment properties for firm *i*, as an average over years prior to and including year *t* for the current CEO.

$MTOB_{i,t}$	The market-to-book ratio for firm *i* in year *t*, calculated as the opening market value of equity divided by opening shareholders' equity.
$VAR_{i,t}$	The variance of investment property revaluations that are expressed as a percentage of opening investment properties (i.e. variance of investment property growth rate), for firm *i* in year *t* and all prior years for which the current CEO also served. A minimum of five years of data for a given CEO are required.
$PERSIST_{i,t}$	The persistence of investment property revaluations that are expressed as a percentage of opening investment properties (i.e. persistence of investment property growth rate), for firm *i* in year *t* and all prior years for which the current CEO also served. A minimum of five years of data for a given CEO are required. Persistence is measured by the coefficient estimate on lagged revaluations when regressing revaluations on lagged revaluations (i.e. α_1 from $REVAL_{i,t} = \alpha_0 + \alpha_1 REVAL_{i,t-1} + \varepsilon_{i,t}$).

Table 4

Descriptive Statistics

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the average for the year. ADD is the average CEO-specific net investment property additions. MTOB is the opening market-to-book ratio. VAR is the variance of investment property revaluations. PERSIST is the persistence of investment property revaluations. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles.

Panel A: Firm characteristics (in £ millions)

Variable	N	Mean	Std. dev.	Min	Q1	Median	Q3	Max
Total assets	445	954.499	1,691.518	11.282	142.965	354.067	830.821	10,195.600
Shareholders' equity	445	504.912	938.641	-40.591	63.867	182.162	438.568	6,150.900
Sales	445	69.471	130.687	0.805	15.437	30.694	61.437	1,481.100
Earnings after tax	445	18.750	41.003	-52.651	1.881	7.858	16.308	328.465
Market value	445	397.698	731.208	0.890	43.540	143.620	336.130	5,078.570
Investment property:								
- Fair value	445	815.366	1,464.451	6.250	113.370	299.969	720.590	9,251.200
- Historical cost	445	570.357	984.077	6.464	94.660	217.528	518.422	6,995.300
Cash compensation	445	0.349	0.283	0.049	0.174	0.287	0.425	2.514

Panel B: Regression variables

Variables	N	Mean	Std. dev.	Min	Q1	Median	Q3	Max
ΔCOMP	445	0.185	0.345	-0.558	0.023	0.105	0.265	1.881
ΔEARN	445	0.032	0.225	-0.360	-0.007	0.005	0.021	1.774
EARN	445	0.047	0.172	-1.146	0.032	0.055	0.081	0.731
RET	445	0.144	0.289	-0.621	-0.032	0.148	0.321	0.921
GL_HC	445	0.026	0.064	-0.172	0	0.007	0.032	0.358
PERM_REVAL	445	-0.007	0.047	-0.425	0	0	0	0
GL	445	0.008	0.030	-0.169	0	0.003	0.013	0.119
REVAL	445	0.123	0.193	-0.453	0.019	0.107	0.191	1.022
EXT	445	0.661	0.474	0	0	1	1	1
BIGN	445	0.762	0.426	0	1	1	1	1
IND	445	0.384	0.487	0	0	0	1	1
CEO_N_CHAIR	445	0.726	0.447	0	0	1	1	1
BOD_SMALL	445	0.321	0.468	0	0	0	1	1
CEO_N_COMP	445	0.899	0.302	0	1	1	1	1
BIAS_LOW	327	0.719	0.450	0	0	1	1	1
ADD	445	0.282	1.135	-0.139	0.022	0.081	0.237	3.980
MTOB	445	0.739	0.764	0.061	0.614	0.759	0.908	1.740
VAR	274	0.012	0.052	0.000	0.002	0.003	0.005	0.423
PERSIST	274	0.134	0.446	-1.022	-0.152	0.151	0.400	2.355

Table 5

Correlation Matrix

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the average for the year. ADD is the average CEO-specific net investment property additions. MTOB is the opening market-to-book ratio. VAR is the variance of investment property revaluations. PERSIST is the persistence of investment property revaluations. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The below values represent the Pearson (Spearman) correlations in the lower (upper) triangles with related *p*-values in parentheses.

Variable	ΔCOMP	ΔEARN	EARN	RET	GL_HC	PERM_ REVAL	GL	REVAL	EXT
ΔCOMP	1	0.055	0.035	0.168	0.105	0.191	0.157	0.293	0.038
		(0.245)	(0.467)	(0.000)	(0.026)	(0.000)	(0.001)	(0.000)	(0.426)
ΔEARN	0.091	1	0.509	0.158	-0.135	0.029	-0.168	0.101	-0.008
	(0.055)		(0.000)	(0.001)	(0.004)	(0.543)	(0.000)	(0.033)	(0.860)
EARN	0.120	0.149	1	0.268	-0.013	0.021	-0.065	0.057	0.094
	(0.011)	(0.002)		(0.000)	(0.791)	(0.659)	(0.171)	(0.230)	(0.049)
RET	0.155	-0.012	0.266	1	0.112	0.097	0.175	0.434	0.047
	(0.001)	(0.808)	(0.000)		(0.019)	(0.041)	(0.000)	(0.000)	(0.325)
GL_HC	0.173	0.058	-0.046	0.073	1	0.054	0.358	0.109	0.073
	(0.000)	(0.223)	(0.337)	(0.123)		(0.256)	(0.000)	(0.022)	(0.123)
PERM_ REVAL	0.090	-0.237	0.159	0.145	0.049	1	0.073	0.183	0.003
	(0.059)	(0.000)	(0.001)	(0.002)	(0.304)		(0.124)	(0.000)	(0.956)
GL	0.025	-0.165	0.061	0.133	0.062	0.065	1	0.188	0.017
	(0.602)	(0.001)	(0.198)	(0.005)	(0.190)	(0.172)		(0.000)	(0.717)
REVAL	0.254	0.193	0.093	0.421	0.041	0.130	0.006	1	0.017
	(0.000)	(0.000)	(0.051)	(0.000)	(0.389)	(0.006)	(0.901)		(0.724)
EXT	-0.010	0.021	0.187	0.058	0.063	0.014	0.043	0.006	1
	(0.832)	(0.663)	(0.000)	(0.221)	(0.184)	(0.764)	(0.372)	(0.904)	
BIGN	-0.080	-0.008	-0.004	-0.009	-0.005	0.058	0.014	-0.106	0.067
	(0.091)	(0.871)	(0.940)	(0.845)	(0.923)	(0.223)	(0.763)	(0.026)	(0.157)
IND	-0.036	-0.004	0.057	-0.016	0.015	0.030	0.118	-0.037	0.049
	(0.453)	(0.939)	(0.233)	(0.737)	(0.749)	(0.526)	(0.013)	(0.442)	(0.302)
CEO_ CHAIR	0.064	0.021	0.205	0.085	-0.002	0.048	0.112	0.054	0.017
	(0.178)	(0.660)	(0.000)	(0.075)	(0.974)	(0.313)	(0.018)	(0.255)	(0.720)
BOD_ SIZE	0.000	0.097	-0.112	-0.134	0.004	-0.176	-0.102	-0.022	0.005
	(0.998)	(0.041)	(0.018)	(0.005)	(0.926)	(0.000)	(0.031)	(0.644)	(0.911)
CEO_ COMP	-0.012	-0.030	-0.066	0.045	0.014	0.057	0.057	-0.020	0.027
	(0.796)	(0.523)	(0.161)	(0.340)	(0.777)	(0.232)	(0.232)	(0.676)	(0.567)
BIAS_LOW	0.022	-0.065	-0.004	-0.025	-0.070	-0.092	-0.063	-0.024	-0.005
	(0.698)	(0.240)	(0.938)	(0.654)	(0.228)	(0.097)	(0.255)	(0.669)	(0.928)
ADD	0.246	0.320	0.178	0.020	-0.031	0.028	-0.017	0.258	0.064
	(0.000)	(0.000)	(0.000)	(0.671)	(0.509)	(0.551)	(0.726)	(0.000)	(0.178)
MTOB	0.072	-0.161	0.038	0.086	0.101	0.070	0.070	0.055	0.054
	(0.129)	(0.001)	(0.425)	(0.070)	(0.033)	(0.142)	(0.144)	(0.250)	(0.261)
VAR	0.040	-0.001	0.012	0.064	0.042	0.026	0.034	0.104	0.122
	(0.507)	(0.920)	(0.849)	(0.291)	(0.491)	(0.675)	(0.571)	(0.085)	(0.044)
PERSIST	-0.064	-0.010	-0.052	0.049	-0.032	-0.021	0.035	0.120	-0.084
	(0.291)	(0.865)	(0.396)	(0.422)	(0.596)	(0.731)	(0.566)	(0.047)	(0.166)

Variable	BIGN	IND	CEO_ CHAIR	BOD_ SIZE	CEO_ COMP	BIAS_LOW	ADD	MTOB	VAR	PERSIST
ΔCOMP	-0.066	-0.049	0.140	-0.098	0.057	0.036	0.166	0.119	0.130	-0.071
	(0.166)	(0.299)	(0.003)	(0.039)	(0.229)	(0.518)	(0.000)	(0.012)	(0.031)	(0.240)
ΔEARN	-0.009	0.066	0.060	-0.069	-0.003	-0.011	0.112	-0.007	-0.010	-0.040
	(0.853)	(0.166)	(0.210)	(0.144)	(0.947)	(0.847)	(0.018)	(0.883)	(0.866)	(0.509)
EARN	0.022	0.021	0.056	-0.081	-0.054	-0.001	0.050	-0.130	-0.153	-0.275
	(0.648)	(0.652)	(0.241)	(0.089)	(0.252)	(0.983)	(0.297)	(0.006)	(0.011)	(0.000)
RET	0.002	-0.026	0.076	-0.113	0.038	-0.008	0.084	-0.120	0.032	0.028
	(0.975)	(0.582)	(0.110)	(0.017)	(0.419)	(0.879)	(0.078)	(0.012)	(0.594)	(0.640)
GL_HC	0.031	0.059	0.020	-0.119	0.017	-0.063	-0.095	-0.050	0.155	-0.101
	(0.519)	(0.215)	(0.675)	(0.012)	(0.727)	(0.255)	(0.045)	(0.292)	(0.010)	(0.096)
PERM_	0.018	-0.042	0.083	-0.092	0.014	-0.099	0.053	0.077	-0.019	-0.029
REVAL	(0.709)	(0.375)	(0.079)	(0.051)	(0.771)	(0.073)	(0.269)	(0.103)	(0.753)	(0.631)
GL	0.010	0.073	0.012	-0.066	0.044	-0.0197	0.019	0.012	-0.090	-0.044
	(0.828)	(0.126)	(0.800)	(0.166)	(0.358)	(0.000)	(0.684)	(0.801)	(0.136)	(0.464)
REVAL	-0.107	-0.066	0.094	-0.022	-0.016	0.014	0.253	0.041	0.159	0.063
	(0.024)	(0.165)	(0.048)	(0.648)	(0.739)	(0.796)	(0.000)	(0.394)	(0.009)	(0.302)
EXT	0.067	0.049	0.017	0.005	0.027	-0.005	-0.071	-0.000	-0.002	-0.042
	(0.157)	(0.302)	(0.720)	(0.911)	(0.567)	(0.928)	(0.135)	(0.999)	(0.970)	(0.493)
BIGN	1	0.268	-0.036	-0.112	0.092	-0.050	-0.047	0.170	0.003	-0.007
		(0.000)	(0.446)	(0.018)	(0.051)	(0.366)	(0.322)	(0.000)	(0.967)	(0.915)
IND	0.268	1	0.144	-0.158	0.127	0.039	-0.105	0.131	-0.185	0.140
	(0.000)		(0.002)	(0.001)	(0.007)	(0.483)	(0.026)	(0.006)	(0.002)	(0.020)
CEO_	-0.036	0.144	1	-0.289	0.379	0.004	0.100	0.096	0.091	0.236
CHAIR	(0.446)	(0.002)		(0.000)	(0.000)	(0.947)	(0.036)	(0.044)	(0.132)	(0.000)
BOD_	-0.112	-0.158	-0.289	1	-0.312	-0.023	-0.105	-0.186	-0.203	-0.121
SIZE	(0.018)	(0.001)	(0.000)		(0.000)	(0.674)	(0.027)	(0.000)	(0.001)	(0.046)
CEO_	0.092	0.127	0.379	-0.312	1	0.010	0.076	0.188	0.009	0.190
COMP	(0.051)	(0.007)	(0.000)	(0.000)		(0.857)	(0.112)	(0.000)	(0.887)	(0.002)
BIAS_LOW	-0.050	0.039	0.004	-0.023	0.010	1	0.010	0.072	0.012	-0.090
	(0.366)	(0.483)	(0.947)	(0.674)	(0.857)		(0.854)	(0.198)	(0.863)	(0.190)
ADD	0.067	0.117	0.097	-0.078	0.057	0.059	1	0.271	0.267	0.035
	(0.159)	(0.014)	(0.041)	(0.101)	(0.231)	(0.291)		(0.000)	(0.000)	(0.566)
MTOB	0.045	0.085	0.030	-0.124	0.087	-0.008	0.094	1	0.076	0.028
	(0.341)	(0.073)	(0.527)	(0.009)	(0.067)	(0.884)	(0.047)		(0.212)	(0.641)
VAR	0.099	-0.047	0.116	-0.110	0.059	0.125	0.102	0.063	1	0.057
	(0.101)	(0.435)	(0.056)	(0.070)	(0.332)	(0.067)	(0.093)	(0.298)		(0.349)
PERSIST	0.006	0.135	0.225	-0.105	0.171	-0.063	-0.097	0.053	-0.071	1
	(0.918)	(0.025)	(0.000)	(0.083)	(0.005)	(0.358)	(0.111)	(0.381)	(0.244)	

	BIGN = 0	BIGN = 1	
EXT = 0	42	109	151
EXT = 1	64	230	294
	106	339	445

Table 6

Changes in Cash Compensation by Revaluation Decile

Changes in cash compensation (ΔCOMP) means and medians are displayed by revaluation (REVAL) decile.

Revaluation decile	N	Percentage change in cash compensation	
		Mean	Median
1 (lowest REVAL)	45	0.012	0.012
2	44	0.110	0.062
3	45	0.148	0.064
4	44	0.091	0.081
5	45	0.132	0.098
6	44	0.306	0.130
7	45	0.206	0.154
8	44	0.243	0.129
9	45	0.262	0.194
10 (highest REVAL)	44	0.343	0.178
Sample	445	0.185	0.105

Table 7

Regressing Changes in Cash Compensation on Revaluations

The regression model is:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.207	0.209	0.172	0.103	0.172
		(1.57)	(1.59)	(1.36)	(4.96)***	(1.37)
ΔEARN	+	0.151	0.129	0.073	0.061	0.046
		(1.20)	(0.95)	(0.70)	(0.79)	(0.39)
EARN	+	0.120	0.134	0.162	0.176	0.180
		(1.40)*	(1.65)*	(1.89)**	(1.81)**	(2.20)**
RET	+	0.148	0.143	0.038	0.026	0.026
		(1.92)**	(1.88)**	(0.45)	(0.41)	(0.33)
GL_HC	+		0.854		0.865	0.905
			(1.87)**		(3.52)***	(1.94)**
PERM_REVAL	+	0.692	0.596	0.457	0.331	0.342
		(3.97)***	(3.06)***	(3.22)***	(0.94)	(2.01)**
GL	?	0.333	0.216	0.393	0.103	0.273
		(0.36)	(0.24)	(0.44)	(0.19)	(0.32)
REVAL	+			0.354	0.386	0.374
				(3.25)***	(4.17)***	(3.25)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
Clustering by firm?		Yes	Yes	Yes	No	Yes
N		445	445	445	445	445
Adjusted R^2		0.047	0.069	0.070	0.090	0.095
F-test of GL_HC=REVAL					3.41	1.51
(*p*-value)					(0.065)	(0.223)

Table 8

Regressing Changes in Cash Compensation on Revaluations and Factors Affecting Objectivity and Verifiability

The regression model for Panels A through G is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN\_{i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 FACTOR_{i,t} + \beta_9 REVAL_{i,t} \cdot FACTOR_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. FACTOR represents the factor affecting revaluation estimate objectivity and verifiability, which are EXT, BIGN, IND, CEO_N_CHAIR, BOD_SMALL, CEO_N_COMP, and BIAS_LOW. EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the average for the year. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: External appraiser

Variable	Predicted sign	1	2	3
Intercept	?	0.178	0.169	0.225
		(1.45)	(5.22)***	(1.82)*
ΔEARN	+	0.046	0.061	0.047
		(0.39)	(0.81)	(0.47)
EARN	+	0.193	0.188	0.196
		(2.24)**	(1.91)**	(2.25)**
RET	+	0.026	0.019	0.015
		(0.32)	(0.31)	(0.18)
GL_HC	+	0.913	0.952	0.966
		(1.97)**	(3.89)***	(2.25)**
PERM_REVAL	+	0.337	0.349	0.372
		(1.95)**	(1.00)	(2.47)***
GL	?	0.279	0.046	0.204
		(0.32)	(0.09)	(0.25)
REVAL	+	0.373	-0.002	-0.016
		(3.21)***	(-0.01)	(-0.10)
EXT	?	-0.023	-0.100	-0.092
		(-0.79)	(-2.55)***	(-2.52)***
REVAL • EXT	+		0.569	0.566
			(3.29)***	(2.64)***
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.094	0.110	0.114
F-test of REVAL+REVAL • EXT=0			28.17	18.99
(*p*-value)			(<0.0001)	(<0.0001)
F-test of GL_HC=REVAL+REVAL •			2.27	0.99
EXT=0 (*p*-value)			(0.133)	(0.324)

Panel B: Big N auditor

Variable	Predicted sign	1	2	3
Intercept	?	0.211 (1.64)	0.182 (4.28)***	0.263 (2.10)**
ΔEARN	+	0.051 (0.43)	0.063 (0.83)	0.051 (0.47)
EARN	+	0.178 (2.16)**	0.140 (1.41)*	0.141 (1.67)**
RET	+	0.030 (0.37)	0.024 (0.39)	0.025 (0.31)
GL_HC	+	0.896 (1.93)**	0.908 (3.68)***	0.944 (2.12)**
PERM_REVAL	+	0.381 (2.12)**	0.346 (0.98)	0.362 (2.24)**
GL	?	0.275 (0.32)	0.004 (0.01)	0.161 (0.19)
REVAL	+	0.356 (2.96)***	0.130 (0.79)	0.106 (0.67)
BIGN	?	-0.045 (-1.45)	-0.097 (-2.12)**	-0.096 (-2.69)***
REVAL • BIGN	+		0.338 (1.78)**	0.350 (1.64)*
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.096	0.096	0.101
F-test of REVAL+REVAL • BIGN=0 (*p*-value)			18.83 (<0.0001)	10.88 (0.002)
F-test of GL_HC=REVAL+REVAL • BIGN=0 (*p*-value)			2.86 (0.091)	1.33 (0.252)

Panel C: Corporate governance - board of director independence

Variable	Predicted sign	1	2	3
Intercept	?	0.180	0.135	0.216
		(1.44)	(5.33)***	(1.74)*
ΔEARN	+	0.048	0.044	0.027
		(0.41)	(0.57)	(0.27)
EARN	+	0.184	0.155	0.158
		(2.25)**	(1.59)*	(2.17)**
RET	+	0.024	0.026	0.021
		(0.30)	(0.41)	(0.27)
GL_HC	+	0.907	0.909	0.952
		(1.95)**	(3.71)***	(2.09)**
PERM_REVAL	+	0.354	0.336	0.360
		(2.05)**	(0.96)	(1.89)**
GL	?	0.328	0.083	0.251
		(0.38)	(0.15)	(0.29)
REVAL	+	0.369	0.218	0.178
		(3.15)***	(1.97)**	(1.40)*
IND	?	-0.028	-0.079	-0.088
		(-0.91)	(-2.10)**	(-2.53)***
REVAL • IND	+		0.446	0.509
			(2.66)***	(2.33)**
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.094	0.102	0.111
F-test of REVAL+REVAL • IND=0			22.54	13.94
(*p*-value)			(<0.0001)	(0.001)
F-test of GL_HC=REVAL+REVAL • IND=0 (*p*-value)			0.87	0.34
			(0.352)	(0.560)

Panel D: Corporate governance - CEO not acting as chairman

Variable	Predicted sign	1	2	3
Intercept	?	0.165	0.156	0.235
		(1.30)	(4.51)***	(1.81)*
ΔEARN	+	0.045	0.066	0.047
		(0.39)	(0.88)	(0.50)
EARN	+	0.165	0.175	0.191
		(1.82)**	(1.81)**	(2.07)**
RET	+	0.026	-0.002	-0.013
		(0.33)	(-0.03)	(-0.17)
GL_HC	+	0.908	1.059	1.089
		(1.92)**	(4.34)***	(2.42)***
PERM_REVAL	+	0.339	0.407	0.413
		(2.02)**	(1.17)	(2.77)***
GL	?	0.232	-0.257	-0.092
		(0.27)	(-0.48)	(-0.12)
REVAL	+	0.372	-0.271	-0.283
		(3.25)***	(-1.63)	(-1.52)
CEO_N_CHAIR	?	0.026	-0.073	-0.071
		(0.80)	(-1.80)*	(-1.61)
REVAL • CEO_N_CHAIR	+		0.886	0.895
			(4.72)***	(3.83)***
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.094	0.131	0.137
F-test of REVAL+REVAL • CEO_N_CHAIR=0 (*p*-value)			35.87	25.55
			(<0.0001)	(<0.0001)
F-test of GL_HC=REVAL+REVAL • CEO_N_CHAIR=0 (*p*-value)			3.13	1.22
			(0.078)	(0.273)

Panel E: Corporate governance - board of director size

Variable	Predicted sign	1	2	3
Intercept	?	0.168 (1.31)	0.088 (3.48)***	0.161 (1.23)
ΔEARN	+	0.045 (0.38)	0.060 (0.79)	0.046 (0.40)
EARN	+	0.182 (2.19)**	0.171 (1.74)**	0.175 (2.22)**
RET	+	0.028 (0.34)	0.026 (0.41)	0.025 (0.30)
GL_HC	+	0.902 (1.95)**	0.873 (3.54)***	0.910 (1.99)**
PERM_REVAL	+	0.354 (2.26)**	0.397 (1.10)	0.387 (2.30)**
GL	?	0.281 (0.33)	0.090 (0.17)	0.251 (0.30)
REVAL	+	0.373 (3.24)***	0.464 (3.81)***	0.448 (3.03)***
BOD_SMALL	?	0.008 (0.23)	0.037 (0.93)	0.027 (0.69)
REVAL • BOD_SMALL	+		-0.165 (-1.00)	-0.149 (-0.65)
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.093	0.089	0.092
F-test of REVAL+REVAL • BOD_SMALL=0 (*p*-value)			5.64 (0.018)	3.18 (0.079)
F-test of GL_HC=REVAL+REVAL • BOD_SMALL=0 (*p*-value)			4.30 (0.039)	2.18 (0.144)

Panel F: Corporate governance - CEO not serving on compensation committee

Variable	Predicted sign	1	2	3
Intercept	?	0.167	0.187	0.247
		(1.29)	(3.29)***	(1.68)*
ΔEARN	+	0.046	-0.002	-0.012
		(0.39)	(-0.03)	(-0.11)
EARN	+	0.181	0.161	0.165
		(2.24)**	(1.65)**	(2.02)**
RET	+	0.026	0.020	0.026
		(0.32)	(0.32)	(0.33)
GL_HC	+	0.906	0.829	0.872
		(1.93)**	(3.40)***	(1.86)**
PERM_REVAL	+	0.341	0.256	0.259
		(2.01)**	(0.73)	(1.61)*
GL	?	0.270	0.146	0.302
		(0.31)	(0.27)	(0.36)
REVAL	+	0.375	-0.166	-0.134
		(3.19)***	(-0.83)	(-0.40)
CEO_N_COMP	?	0.007	-0.098	-0.080
		(0.10)	(-1.64)	(-0.75)
REVAL • CEO_N_COMP	+		0.693	0.645
			(3.13)***	(1.78)**
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.093	0.106	0.108
F-test of REVAL+REVAL • CEO_N_COMP=0 (*p*-value)			26.56	19.10
			(<0.0001)	(<0.0001)
F-test of GL_HC=REVAL+REVAL • CEO_N_COMP=0 (*p*-value)			1.34	0.69
			(0.248)	(0.410)

Panel G: Estimation bias is low

Variable	Predicted sign	1	2	3
Intercept	?	0.262 (1.11)	0.090 (1.99)**	0.293 (1.25)
ΔEARN	+	0.025 (0.15)	0.078 (0.73)	0.090 (0.53)
EARN	+	0.230 (1.96)**	0.157 (1.21)	0.166 (1.48)*
RET	+	0.076 (0.79)	0.075 (1.01)	0.084 (0.85)
GL_HC	+	0.898 (1.86)**	0.871 (3.51)***	0.905 (1.88)**
PERM_REVAL	+	-0.079 (-0.07)	0.545 (0.40)	0.052 (0.05)
GL	?	0.126 (0.14)	-0.052 (-0.10)	0.103 (0.12)
REVAL	+	0.466 (2.83)***	0.251 (1.19)	0.191 (0.80)
BIAS_LOW	?	0.032 (0.71)	-0.009 (-0.17)	-0.015 (-0.42)
REVAL • BIAS_LOW	+		0.328 (1.38)*	0.364 (1.46)*
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		327	327	327
Adjusted R^2		0.113	0.118	0.117
F-test of REVAL+REVAL • BIAS_LOW=0 (*p*-value)			18.79 (<0.0001)	9.85 (0.003)
F-test of GL_HC=REVAL+REVAL • BIAS_LOW=0 (*p*-value)			1.14 (0.286)	0.59 (0.447)

Table 9

Regressing Changes in Cash Compensation on Revaluations and Growth Opportunities

The regression model for Panels A and B is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 FACTOR_{i,t} + \beta_9 REVAL_{i,t} \cdot FACTOR_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. FACTOR represents the factor affecting growth opportunities, which are ADD and MTOB. ADD is the average CEO-specific net investment property additions. MTOB is the opening market-to-book ratio. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Net investment property additions

Variable	Predicted sign	1	2	3
Intercept	?	0.181	0.106	0.195
		(1.50)	(5.01)***	(1.57)
ΔEARN	+	-0.042	-0.056	-0.074
		(-0.49)	(-0.70)	(-0.91)
EARN	+	0.122	0.110	0.109
		(1.64)*	(1.14)	(1.49)*
RET	+	0.058	0.055	0.063
		(0.72)	(0.89)	(0.75)
GL_HC	+	0.969	0.954	0.988
		(2.12)**	(3.86)***	(2.22)**
PERM_REVAL	+	0.258	0.239	0.253
		(2.11)**	(0.69)	(1.95)**
GL	?	0.191	-0.019	0.154
		(0.23)	(-0.04)	(0.19)
REVAL	+	0.282	0.269	0.245
		(2.71)***	(2.84)***	(2.42)***
ADD	?	0.063	0.023	0.025
		(5.08)***	(0.91)	(1.26)
REVAL • ADD	+		0.059	0.061
			(1.82)**	(3.35)***
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.130	0.126	0.135
F-test of REVAL+REVAL • ADD=0			12.13	9.94
(*p*-value)			(0.001)	(0.002)
F-test of GL_HC=REVAL+REVAL •			5.63	2.77
ADD=0 (*p*-value)			(0.018)	(0.100)

Panel B: Market-to-book ratio

Variable	Predicted sign	1	2	3
Intercept	?	0.155 (1.23)	0.059 (2.29)**	0.141 (1.13)
ΔEARN	+	0.059 (0.49)	0.063 (0.83)	0.046 (0.43)
EARN	+	0.175 (2.17)**	0.109 (1.12)	0.118 (1.45)*
RET	+	0.020 (0.25)	0.031 (0.50)	0.026 (0.34)
GL_HC	+	0.895 (1.85)**	0.982 (3.94)***	1.011 (2.19)**
PERM_REVAL	+	0.338 (2.04)**	0.278 (0.81)	0.279 (1.91)**
GL	?	0.252 (0.29)	-0.054 (-0.10)	0.111 (0.14)
REVAL	+	0.380 (3.30)***	0.112 (0.92)	0.113 (0.93)
MTOB	?	0.018 (0.86)	0.044 (2.02)**	0.044 (2.49)**
REVAL • MTOB	+		0.443 (3.47)***	0.443 (2.89)***
YEAR indicators?		Yes	No	Yes
Clustering by firm?		Yes	No	Yes
N		445	445	445
Adjusted R^2		0.098	0.117	0.120
F-test of REVAL+REVAL • MTOB=0 (*p*-value)			29.91 (<0.0001)	19.08 (<0.0001)
F-test of GL_HC=REVAL+REVAL • MTOB=0 (*p*-value)			2.68 (0.102)	1.00 (0.321)

Table 10

Regressing Changes in Cash Compensation on Revaluations and Revaluation Variance

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 VAR_{i,t} + \beta_9 REVAL_{i,t} \cdot VAR_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. VAR is the variance of investment property revaluations. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted sign	1	2	3
Intercept	?	0.078 (2.93)***	0.080 (2.59)***	0.080 (2.77)***
ΔEARN	+	-0.312 (-1.58)	-0.311 (-2.38)	-0.311 (-1.57)
EARN	+	0.115 (1.23)	0.115 (0.99)	0.115 (1.23)
RET	+	0.139 (1.40)*	0.139 (1.72)**	0.139 (1.40)*
GL_HC	+	1.605 (2.64)***	1.601 (5.02)***	1.605 (2.64)***
PERM_REVAL	+	0.268 (0.73)	0.270 (0.67)	0.270 (0.74)
GL	?	-0.767 (-0.72)	-0.770 (-1.11)	-0.770 (-0.72)
REVAL	+	0.315 (2.00)**	0.308 (2.19)**	0.308 (1.82)**
VAR	?	0.061 (0.22)	-0.096 (-0.09)	-0.096 (-0.26)
REVAL • VAR	-		0.757 (0.15)	0.757 (0.28)
YEAR indicators?		No	No	No
Clustering by firm?		Yes	No	Yes
N		274	274	274
Adjusted R^2		0.127	0.124	0.124
F-test of REVAL+REVAL • VAR=0 (*p*-value)			8.36 (0.004)	17.52 (0.0001)
F-test of GL_HC=REVAL+REVAL • VAR=0 (*p*-value)			6.43 (0.012)	2.84 (0.098)

Table 11

Regressing Changes in Cash Compensation on Revaluations and Revaluation Persistence

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 PERSIST_{i,t} + \beta_9 REVAL_{i,t} \cdot PERSIST_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. PERSIST is the persistence of investment property revaluations. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted sign	1	2	3
Intercept	?	0.085	0.075	0.075
		(3.26)***	(2.42)**	(2.64)**
ΔEARN	+	-0.314	-0.322	-0.322
		(-1.58)	(-2.48)	(-1.61)
EARN	+	0.105	0.101	0.101
		(1.11)	(0.87)	(1.06)
RET	+	0.141	0.143	0.143
		(1.43)*	(1.78)**	(1.45)*
GL_HC	+	1.584	1.573	1.573
		(2.64)***	(4.93)***	(2.63)***
PERM_REVAL	+	0.245	0.240	0.240
		(0.64)	(0.59)	(0.64)
GL	?	-0.745	-0.766	-0.766
		(-0.69)	(-1.11)	(-0.71)
REVAL	+	0.333	0.413	0.413
		(2.15)**	(2.64)***	(2.40)***
PERSIST	?	-0.058	-0.017	-0.017
		(-1.85)*	(-0.27)	(-0.41)
REVAL • PERSIST	+		-0.232	-0.232
			(-0.97)	(-1.36)
YEAR indicators?		No	No	No
Clustering by firm?		Yes	No	Yes
N		274	274	274
Adjusted R^2		0.133	0.133	0.133
F-test of REVAL+REVAL • PERSIST=0			0.89	1.61
(*p*-value)			(0.346)	(0.210)
F-test of GL_HC=REVAL+REVAL •			13.18	4.91
PERSIST=0 (*p*-value)			(0.0003)	(0.031)

Table 12

Robustness Tests for Regressing Changes in Cash Compensation on Revaluations

The regression model is:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Variable definitions

Variable	Predicted Sign	No winsorizing	Chg in ln(COMP) dep	Scale ind var by assets	Scale ind var by inv prop	Keep all obs with inv prop >0
Intercept	?	0.193	0.134	0.182	0.165	0.181
		(1.54)	(1.47)	(1.47)	(1.42)	(1.65)
ΔEARN	+	-0.030	0.031	0.123	0.598	0.064
		(-0.63)	(0.50)	(1.30)*	(1.01)	(0.54)
EARN	+	0.121	0.139	-0.104	0.151	0.100
		(2.16)**	(2.12)**	(-0.14)	(0.29)	(1.45)*
RET	+	0.019	0.041	0.049	0.046	0.130
		(0.20)	(0.68)	(0.65)	(0.59)	(1.38)*
GL_HC	+	0.771	0.568	3.956	3.159	0.976
		(1.97)**	(2.00)**	(2.66)***	(2.60)***	(2.11)**
PERM_REVAL	+	0.124	0.473	3.190	2.631	-0.316
		(2.53)***	(2.58)***	(2.19)**	(2.49)***	(-0.44)
GL	?	0.229	0.406	0.510	0.169	-0.095
		(0.64)	(0.76)	(0.21)	(0.09)	(-0.12)
REVAL	+	0.231	0.288	1.177	1.015	0.324
		(5.43)***	(3.57)***	(3.83)***	(3.85)***	(2.54)***
YEAR indicators?		Yes	Yes	Yes	Yes	Yes
Clustering by firm?		Yes	Yes	Yes	Yes	Yes
N		445	445	448	448	512
Adjusted R^2		0.065	0.101	0.113	0.101	0.073

Panel B: Prais-Winston regression

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.207	0.210	0.170	0.103	0.172
		(1.56)	(1.59)	(1.34)	(5.14)***	(1.36)
ΔEARN	+	0.154	0.132	0.072	0.060	0.044
		(1.19)	(0.94)	(0.66)	(0.78)	(0.36)
EARN	+	0.111	0.123	0.152	0.165	0.166
		(1.34)*	(1.56)*	(1.84)**	(1.74)**	(2.12)**
RET	+	0.148	0.144	0.031	0.022	0.022
		(1.96)**	(1.94)**	(0.38)	(0.36)	(0.27)
GL_HC	+		0.856		0.864	0.906
			(1.87)**		(3.52)***	(1.94)**
PERM_REVAL	+	0.676	0.581	0.417	0.296	0.304
		(3.70)***	(2.82)***	(2.69)***	(0.86)	(1.65)*
GL	?	0.330	0.197	0.385	0.075	0.239
		(0.36)	(0.22)	(0.44)	(0.14)	(0.29)
REVAL	+			0.359	0.389	0.378
				(3.42)***	(4.30)***	(3.38)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
Clustering by firm?		Yes	Yes	Yes	No	Yes
N		445	445	445	445	445
Adjusted R^2		0.046	0.068	0.070	0.090	0.096
Rho		-0.044	-0.047	-0.066	-0.066	-0.070

Panel C: Newey-West standard errors

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.207 (1.57)	0.209 (1.60)	0.172 (1.36)	0.103 (5.25)***	0.172 (1.38)
ΔEARN	+	0.151 (1.21)	0.129 (0.97)	0.073 (0.68)	0.061 (0.55)	0.046 (0.39)
EARN	+	0.120 (1.25)	0.134 (1.32)*	0.162 (1.49)*	0.176 (1.71)**	0.180 (1.52)*
RET	+	0.148 (1.89)**	0.143 (1.85)**	0.038 (0.46)	0.026 (0.40)	0.026 (0.33)
GL_HC	+		0.854 (2.12)**		0.865 (2.01)**	0.905 (2.25)**
PERM_REVAL	+	0.692 (2.42)***	0.596 (2.01)**	0.457 (1.64)*	0.331 (1.18)	0.342 (1.17)
GL	?	0.333 (0.36)	0.216 (0.25)	0.393 (0.43)	0.103 (0.12)	0.273 (0.32)
REVAL	+			0.354 (3.11)***	0.386 (3.38)***	0.374 (3.24)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
Clustering by firm?		Yes	Yes	Yes	No	Yes
N		445	445	445	445	445
R^2		0.081	0.104	0.106	0.104	0.132

Panel D: Inclusion of firm indicator variables for firms having > 1 observation

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.421	0.467	0.212	0.115	0.246
		(1.44)	(1.63)	(0.69)	(0.44)	(0.82)
ΔEARN	+	0.062	0.028	0.011	-0.028	-0.027
		(0.73)	(0.33)	(0.13)	(-0.33)	(-0.31)
EARN	+	0.396	0.482	0.431	0.550	0.522
		(2.58)***	(3.15)***	(2.81)***	(3.75)***	(3.41)***
RET	+	0.150	0.139	0.082	0.043	0.066
		(2.02)**	(1.90)**	(1.02)	(0.63)	(0.84)
GL_HC	+		1.035		1.033	1.061
			(3.61)***		(3.71)***	(3.72)***
PERM_REVAL	+	1.152	1.059	1.180	1.209	1.087
		(1.92)**	(1.82)**	(2.00)**	(2.11)**	(1.88)**
GL	?	0.309	0.272	0.374	0.204	0.340
		(0.46)	(0.41)	(0.55)	(0.31)	(0.51)
REVAL	+			0.281	0.354	0.300
				(2.18)**	(3.17)***	(2.36)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
FIRM indicators?		Yes	Yes	Yes	Yes	Yes
N		442	442	442	442	442
Adjusted R^2		0.032	0.064	0.042	0.070	0.076
Number of FIRM indicators		72	72	72	72	72

Panel E: Fama-MacBeth regression

Variable	Predicted Sign	Unweighted	Weighted
Intercept	?	0.079	0.122
		(1.82)*	(5.14)***
ΔEARN	+	0.26	0.272
		(0.87)	(0.99)
EARN	+	-0.210	-0.421
		(-0.62)	(-1.46)
RET	+	-0.222	0.049
		(-0.85)	(0.43)
GL_HC	+	0.498	0.449
		(1.00)	(0.98)
PERM_REVAL	+	8.524	7.725
		(1.19)	(1.10)
GL	?	1.787	0.767
		(1.13)	(0.74)
REVAL	+	0.681	0.267
		(1.51)*	(1.35)
N		445	445
R^2		0.025	0.025
Number of years		11	11

Panel F: Removal of influential outliers (Cook's D > 4/N)

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.104	0.104	0.044	0.091	0.049
		(2.40)**	(2.22)**	(0.87)	(7.22)***	(0.97)
ΔEARN	+	0.252	0.241	0.158	0.100	0.116
		(3.77)***	(3.47)***	(2.63)***	(1.85)**	(1.99)**
EARN	+	0.069	0.069	-0.006	0.130	0.017
		(0.93)	(1.05)	(-0.10)	(1.32)*	(0.19)
RET	+	0.137	0.104	0.045	-0.004	0.030
		(2.58)***	(2.26)**	(0.76)	(-0.09)	(0.49)
GL_HC	+		0.358		0.433	0.401
			(1.79)**		(2.11)**	(1.95)**
PERM_REVAL	+	0.658	0.688	0.293	1.269	0.419
		(2.29)**	(2.34)**	(1.43)*	(2.59)***	(1.69)**
GL	?	0.857	0.562	0.827	0.504	0.540
		(2.06)**	(1.35)	(2.05)**	(1.19)	(1.30)
REVAL	+			0.345	0.393	0.365
				(4.02)***	(5.42)***	(3.98)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
Clustering by firm?		Yes	Yes	Yes	No	Yes
N		422	421	423	419	420
Adjusted R^2		0.084	0.068	0.111	0.095	0.102
Number of outliers removed		23	24	22	26	25

Panel G: Bootstrapping of standard errors using 1000 replications

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	0.207	0.209	0.172	0.103	0.172
Clustered std err		(0.132)	(0.132)	(0.126)	(0.021)	(0.125)
Bootstrapped std err		(0.143)	(0.151)	(0.139)	(0.020)	(0.139)
Bootstrapped t-stat		(1.64)*	(1.38)	(1.24)	(5.15)***	(1.24)
ΔEARN	+	0.151	0.129	0.073	0.061	0.046
Clustered std err		(0.126)	(0.136)	(0.104)	(0.077)	(0.117)
Bootstrapped std err		(0.151)	(0.169)	(0.127)	(0.147)	(0.155)
Bootstrapped t-stat		(1.00)	(0.76)	(0.57)	(0.41)	(0.30)
EARN	+	0.120	0.134	0.162	0.176	0.180
Clustered std err		(0.086)	(0.082)	(0.086)	(0.098)	(0.082)
Bootstrapped std err		(0.173)	(0.193)	(0.168)	(0.173)	(0.198)
Bootstrapped t-stat		(0.69)	(0.69)	(0.96)	(1.02)	(0.91)
RET	+	0.148	0.143	0.038	0.026	0.026
Clustered std err		(0.077)	(0.076)	(0.084)	(0.063)	(0.081)
Bootstrapped std err		(0.080)	(0.080)	(0.082)	(0.062)	(0.081)
Bootstrapped t-stat		(1.85)**	(1.79)**	(0.46)	(0.42)	(0.32)
GL_HC	+		0.854		0.865	0.905
Clustered std err			(0.457)		(0.246)	(0.467)
Bootstrapped std err			(0.493)		(0.447)	(0.485)
Bootstrapped t-stat			(1.73)**		(1.94)**	(1.87)**
PERM_REVAL	+	0.692	0.596	0.457	0.331	0.342
Clustered std err		(0.174)	(0.195)	(0.142)	(0.354)	(0.170)
Bootstrapped std err		(0.476)	(0.618)	(0.432)	(0.568)	(0.646)
Bootstrapped t-stat		(1.45)*	(0.96)	(1.06)	(0.58)	(0.53)
GL	?	0.333	0.216	0.393	0.103	0.273
Clustered std err		(0.931)	(0.901)	(0.894)	(0.538)	(0.856)
Bootstrapped std err		(0.979)	(0.970)	(0.962)	(0.886)	(0.887)
Bootstrapped t-stat		(0.34)	(0.22)	(0.41)	(0.12)	(0.31)
REVAL	+			0.354	0.386	0.374
Clustered std err				(0.109)	(0.093)	(0.115)
Bootstrapped std err				(0.116)	(0.114)	(0.117)
Bootstrapped t-stat				(3.05)***	(3.39)***	(3.20)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
FIRM indicators?		Yes	Yes	Yes	No	Yes
N		445	445	445	445	445

Table 13

Regressing Changes in Cash Compensation on Revaluations and Rental Income

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the average for the year. ADD is the average CEO-specific net investment property additions. MTOB is the opening market-to-book ratio. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. *, **, *** represent significant differences between groups at 10%, 5%, and 1% respectively.

Panel A: Firm characteristics (in £ millions)

	Low rental income			High rental income			Mean	Median
Variable	N	Mean	Median	N	Mean	Median	diff?	diff?
Total assets	317	1,250.18	510.04	128	221.911	125.57	***	***
Shareholders' equity	317	661.63	247.59	128	116.72	61.76	***	***
Sales	317	84.87	34.43	128	31.32	20.23	***	***
Earnings after tax	317	23.82	9.07	128	6.20	4.10	***	***
Market value	317	522.89	219.91	128	87.65	49.25	***	***
Investment property:								
- Fair value	317	1,076.21	439.91	128	169.38	106.75	***	***
- Historical cost	317	749.66	326.85	128	126.29	87.26	***	***
Cash compensation	317	0.397	0.330	128	0.232	0.192	***	***
Net % chg inv prop	317	0.175	0.037	128	0.156	0.054		

Panel B: Regression variables

	Low rental income			High rental income			Mean	Median
Variables	N	Mean	Median	N	Mean	Median	diff?	diff?
ΔCOMP	317	0.184	0.103	128	0.187	0.110		
ΔEARN	317	0.028	0.003	128	0.040	0.013		***
EARN	317	0.039	0.049	128	0.068	0.083		***
RET	317	0.136	0.126	128	0.165	0.164		
GL_HC	317	0.028	0.009	128	0.020	0.004		**
PERM_REVAL	317	-0.006	0	128	-0.010	0		
GL	317	0.007	0.003	128	0.011	0.005		
REVAL	317	0.120	0.115	128	0.129	0.100		
EXT	317	0.678	1	128	0.617	1		
BIGN	317	0.792	1	128	0.688	1	**	**
IND	317	0.413	0	128	0.313	0	**	**
CEO_N_CHAIR	317	0.748	1	128	0.672	1		
BOD_SMALL	317	0.252	0	128	0.492	0	***	***
CEO_N_COMP	317	0.927	1	128	0.828	1	***	***
BIAS_LOW	317	0.798	1	128	0.781	1		
ADD	317	0.323	0.080	128	0.181	0.082		
MTOB	317	0.771	0.764	128	0.660	0.752		

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN\_{i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 RENT\_INC_{i,t} + \beta_9 REVAL_{i,t} \cdot RENT\_INC_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. RENT_INC represents the relative rental income generated by investment properties, with RENT_INC=1 when relative rental income is > the sample mean. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel C: Regression by rental income

Variable	Predicted sign	Low rental income	High rental income	Pooled
Intercept	?	0.050	0.240	0.166
		(0.22)	(1.33)	(1.32)
ΔEARN	+	0.039	-0.148	0.028
		(0.43)	(-0.70)	(0.26)
EARN	+	0.219	0.617	0.216
		(1.74)**	(1.52)*	(2.44)***
RET	+	0.038	0.050	0.030
		(0.43)	(0.35)	(0.37)
GL_HC	+	0.826	0.989	0.896
		(2.84)***	(1.84)**	(1.91)**
PERM_REVAL	+	0.552	-0.953	0.301
		(1.22)	(-0.71)	(1.77)**
GL	?	0.222	0.494	0.238
		(0.34)	(0.45)	(0.27)
REVAL	+	0.482	0.020	0.491
		(4.06)***	(0.10)	(3.41)***
RENT_INC	?			0.040
				(0.88)
REVAL • RENT_INC	-			-0.435
				(-1.72)**
YEAR indicators?		Yes	Yes	Yes
Clustering by firm?		No	No	Yes
N		317	128	445
Adjusted R^2		0.119	0.029	0.102

Table 14

Regressing Changes in Total Cash and Total Compensation on Revaluations

The regression model is:

$$\Delta COMP/\Delta TOT\_CASH\_COMP/\Delta TOT\_COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔTOT_CASH_COMP is the percentage change in total CEO cash compensation, including cash LTIPs. ΔTOT_COMP is the percentage change in CEO total compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted Sign	ΔCOMP	ΔTOT_CASH_COMP	ΔTOT_COMP
Intercept	?	0.172	0.176	0.330
		(1.37)	(1.38)	(1.76)*
ΔEARN	+	0.046	0.035	0.113
		(0.39)	(0.31)	(0.63)
EARN	+	0.180	0.178	0.275
		(2.20)**	(1.89)**	(2.02)**
RET	+	0.026	0.076	0.060
		(0.33)	(0.79)	(0.54)
GL_HC	+	0.905	0.883	1.252
		(1.94)**	(1.77)**	(1.73)**
PERM_REVAL	+	0.342	0.264	0.110
		(2.01)**	(1.35)*	(0.31)
GL	?	0.273	0.470	0.189
		(0.32)	(0.56)	(0.15)
REVAL	+	0.374	0.353	0.494
		(3.25)***	(2.77)***	(2.86)***
YEAR indicators?		Yes	Yes	Yes
Clustering by firm?		Yes	Yes	Yes
N		445	445	445
Adjusted R^2		0.095	0.066	0.069

Table 15

Regressing Average Changes in Total Compensation on Average Revaluations

The regression model is:

$$\Delta TOT\_COMP\_AVE_{i,t} = \alpha_0 + \alpha_1 \Delta EARN\_AVE_{i,t} + \alpha_2 EARN\_AVE_{i,t} + \alpha_3 RET\_AVE_{i,t} + \alpha_4 GL\_HC\_AVE_{i,t} + \alpha_5 PERM\_REVAL\_AVE_{i,t} + \alpha_6 GL\_AVE_{i,t} + \alpha_7 REVAL\_AVE_{i,t} + \varepsilon_{i,t}.$$

ΔTOT_COMP_AVE is the average percentage change in CEO total compensation over a CEO's tenure. ΔEARN_AVE is the change in core earnings after tax. EARN_AVE is the core earnings after tax. RET_AVE is the annual stock return. GL_HC_AVE is the amount of past revaluations recognized on investment property sales. PERM_REVAL_AVE are the recognized impairments in the value of investment properties. GL_AVE is the gain/loss on sales of investment properties relative to fair value. REVAL_AVE is revaluations of investment properties. Annual values for ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All annual values for non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted Sign	1	2	3
Intercept	?	0.140 (7.81)***	0.140 (3.55)***	0.162 (3.83)***
ΔEARN_AVE	+	-0.145 (-1.48)	-0.145 (-0.44)	-0.242 (-1.33)
EARN_AVE	+	-0.012 (-0.14)	-0.012 (-0.05)	0.006 (0.02)
RET_AVE	+	-0.152 (-1.60)	-0.152 (-0.61)	-0.150 (-0.78)
GL_HC_AVE	+	0.944 (2.85)***	0.944 (1.14)	0.342 (0.43)
PERM_REVAL_AVE	+	-0.475 (-1.50)	-0.475 (-0.36)	-0.576 (-0.71)
GL_AVE	?	0.694 (1.17)	0.694 (0.56)	0.420 (0.29)
REVAL_AVE	+	0.668 (6.29)***	0.668 (2.36)***	0.536 (2.27)**
Clustering by CEO?		No	Yes	NA
N		445	445	96
R^2		0.109	0.109	0.068
Adjusted R^2		0.095	0.095	-0.006

Table 16

Tests for Regressing Changes in Cash Compensation on CEO Changes

Year *t* represents the year where a CEO change occurred. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. The figure in parentheses represent the number of observations. All *t*-statistics are two-tailed and are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Variable means for entire sample and CEO change firms relative to CEO change year (year = *t*)

Variable	Year *t*-2	Year *t*-1	Year *t*	Year *t*+1	Year *t*+2
ΔEARN					
Sample mean	0.023 (391)	0.008 (471)	0.034 (552)	0.034 (551)	0.021 (472)
CEO change firms	0.098 (32)	-0.045 (36)	-0.165 (38)	0.187 (35)	-0.242 (26)
t-statistic	-1.12	0.61	1.60	-1.23	1.68*
EARN					
Sample mean	0.0649 (453)	0.0415 (534)	0.035 (612)	0.030 (551)	0.015 (472)
CEO change firms	0.145 (35)	-0.012 (37)	-0.213 (38)	-0.004 (35)	-0.338 (26)
t-statistic	-1.11	0.53	2.15**	0.34	2.45**
RET					
Sample mean	0.135 (511)	0.148 (583)	0.122 (612)	0.161 (630)	0.170 (613)
CEO change firms	0.052 (35)	0.066 (37)	0.098 (38)	0.132 (38)	0.155 (36)
t-statistic	1.21	1.24	0.46	0.56	0.29
GL_HC					
Sample mean	0.016 (511)	0.017 (583)	0.024 (612)	0.023 (630)	0.023 (613)
CEO change firms	0.008 (35)	0.021 (37)	0.021 (38)	-0.002 (38)	0.006 (36)
t-statistic	0.70	-0.37	0.20	1.91*	1.26
PERM_REVAL					
Sample mean	-0.005 (511)	-0.012 (583)	-0.015 (612)	-0.015 (630)	-0.015 (613)
CEO change firms	-0.004 (35)	-0.026 (37)	-0.036 (38)	-0.017 (38)	-0.026 (36)
t-statistic	-0.12	0.52	0.74	0.07	0.40
GL					
Sample mean	0.008 (511)	0.009 (583)	0.007 (612)	0.006 (630)	0.006 (613)
CEO change firms	-0.001 (35)	0.006 (37)	0.009 (38)	0.002 (38)	-0.000 (36)
t-statistic	1.74*	0.60	-0.22	0.44	0.58
REVAL					
Sample mean	0.130 (492)	0.113 (569)	0.102 (609)	0.109 (551)	0.117 (472)
CEO change firms	-0.094 (34)	0.012 (36)	0.051 (38)	0.280 (35)	0.142 (26)
t-statistic	2.06**	1.58	0.93	-2.34**	-0.69

The probit regression model is:

$$CEO\_CHG_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,s} + \alpha_2 EARN_{i,s} + \alpha_3 RET_{i,s} + \alpha_4 GL\_HC_{i,s} + \alpha_5 PERM\_REVAL_{i,s} + \alpha_6 GL_{i,s} + \alpha_7 REVAL_{i,s} + \varepsilon_{i,s}.$$

Subscript *s* represents the data year relative to year *t*, which is the year the CEO change occurred. CEO_CHG is given a value of 1 if a CEO change occurred in a given firm-year and 0 otherwise. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *z*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *z*-statistics are one-tailed; *z*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel B: Probit regression model

Variable	Predicted Sign	*s* = *t*	*s* = *t*-1	*s* = (*t*-1 + *t*-2)/2	*s* = (*t* + *t*-1 + *t*-2)/3
Intercept	?	-1.434	-1.372	-1.221	-1.175
		(-15.27)***	(-14.40)***	(-10.40)***	(-9.16)***
ΔEARN	-	-0.058	-0.189	-0.474	-1.002
		(-0.27)	(-0.36)	(-0.46)	(-1.06)
EARN	-	-0.184	0.053	0.246	0.228
		(-0.91)	(0.12)	(0.31)	(0.40)
RET	-	-0.091	-0.518	-0.090	0.032
		(-0.30)	(-1.63)*	(-0.15)	(0.04)
GL_HC	-	-0.320	0.498	-0.805	-1.312
		(-0.30)	(0.43)	(-0.42)	(-0.58)
PERM_REVAL	-	-0.188	-0.166	0.412	0.278
		(-0.37)	(-0.34)	(0.37)	(0.28)
GL	?	0.094	-1.579	-3.125	-1.557
		(0.05)	(-0.51)	(-0.73)	(-0.36)
REVAL	-	-0.455	-0.409	-2.179	-2.637
		(-1.36)*	(-1.25)	(-2.46)***	(-2.86)***
N		552	470	389	389
Pseudo R^2		0.024	0.032	0.080	0.086
Likelihood ratio χ^2 (*p*-value)		6.49 (0.48)	7.89 (0.34)	17.23 (0.02)	18.53 (0.01)

Table 17

Regressing Changes in Cash Compensation on Rolling Averages of Revaluations

The regression model is:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,ave\_t} + \alpha_2 EARN_{i,ave\_t} + \alpha_3 RET_{i,ave\_t} + \alpha_4 GL\_HC_{i,ave\_t} + \alpha_5 PERM\_REVAL_{i,ave\_t} + \alpha_6 GL_{i,ave\_t} + \alpha_7 REVAL_{i,ave\_t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

All independent variables are calculated as a rolling average including the current year, denoted as *ave_t* above. ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted sign	Number of years for calculation of rolling averages 2	3	4
Intercept	?	0.014	0.156	0.050
		(0.35)	(2.80)***	(0.71)
ΔEARN	+	-0.102	-0.473	-0.571
		(-0.61)	(-1.57)	(-1.36)
EARN	+	0.206	0.168	0.116
		(2.16)**	(1.37)*	(0.61)
RET	+	-0.066	-0.032	0.063
		(-0.55)	(-0.19)	(0.25)
GL_HC	+	1.411	1.919	2.215
		(1.98)**	(2.31)**	(2.15)**
PERM_REVAL	+	0.400	-0.541	-0.573
		(1.04)	(-1.11)	(-0.71)
GL	?	-0.651	-1.275	-1.832
		(-0.67)	(-0.98)	(-1.10)
REVAL	+	0.433	0.400	0.362
		(3.04)***	(1.78)**	(1.01)
YEAR indicators?		Yes	Yes	Yes
Clustering by firm?		Yes	Yes	Yes
N		349	265	203
Adjusted R^2		0.095	0.075	0.064

Table 18

Regressing Changes in Cash Compensation on Industry-Adjusted Revaluations

The regression model is:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL\_ADJ_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

All independent variables are calculated as a rolling average including the current year. ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL_ADJ is industry-adjusted revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: UK commercial property real capital growth	Industry	Sample	Sample obs.
1994	4.75%	1.66%	4
1995	-3.85%	-4.20%	30
1996	2.30%	0.05%	56
1997	9.60%	8.50%	57
1998	4.95%	7.49%	56
1999	7.70%	6.74%	53
2000	3.75%	5.99%	43
2001	0.15%	3.38%	35
2002	2.60%	0.76%	36
2003	3.90%	-0.96%	34
2004	11.4%	3.49%	28
2005	12.8%	5.98%	13
Average (equal weight given to each year)	5.00%	3.24%	445

Panel B: Correlation of UK commercial property real capital growth between industry and sample (Pearson - lower, Spearman - upper)

Industry	1	0.657 (0.020)
Sample	0.681 (0.015)	1

Panel C: Cross-sectional regression of changes in cash compensation on industry-adjusted revaluations

Variable	Predicted Sign	1	2
Intercept	?	0.160 (8.17)***	0.228 (1.79)*
ΔEARN	+	0.164 (2.23)**	0.144 (1.95)**
EARN	+	0.045 (0.46)	0.055 (0.47)
RET	+	0.087 (1.54)*	0.075 (0.96)
GL_HC	+	1.082 (4.38)***	1.081 (2.39)***
PERM_REVAL	+	0.130 (0.37)	0.176 (0.71)
GL	?	-0.370 (-0.69)	-0.213 (-0.25)
REVAL_ADJ	+	0.208 (5.30)***	0.206 (4.82)***
YEAR indicators?		No	Yes
Clustering by firm?		No	Yes
N		445	445
Adjusted R^2		0.111	0.122

Table 19

Regressing Changes in Cash Compensation on Revaluations by Governance Quality

The regression model is:

$$\Delta COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

All independent variables are calculated as a rolling average including the current year. ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. YEAR represents a vector of year-specific indicator variables. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. Regressions are performed for three levels of governance: low - IND=0 and CEO_N_CHAIR=0; high - IND=1 and CEO_N_CHAIR=1; and moderate - all remaining observations. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted sign	Governance level		
		Low	Moderate	High
Intercept	?	0.678	-0.006	0.102
		(2.78)***	(-0.04)	(0.96)
ΔEARN	+	-0.632	0.048	0.474
		(-2.95)	(0.38)	(2.17)**
EARN	+	0.393	0.047	-0.141
		(2.12)**	(0.23)	(-0.36)
RET	+	-0.298	0.100	-0.024
		(-1.59)	(1.04)	(-0.17)
GL_HC	+	1.833	1.227	0.398
		(3.75)***	(2.87)***	(0.80)
PERM_REVAL	+	-2.048	0.322	0.754
		(-1.64)	(0.85)	(0.42)
GL	?	-1.385	1.318	0.036
		(-1.36)	(1.26)	(0.04)
REVAL	+	-0.125	0.440	0.550
		(-0.54)	(2.93)***	(2.80)***
YEAR indicators?		Yes	Yes	Yes
Clustering by firm?		No	No	No
N		89	218	138
Adjusted R^2		0.220	0.147	0.167

Table 20

Regressing Changes in Cash Compensation on Revaluations and Governance Factor

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 GOV_{i,t} + \beta_9 REVAL_{i,t} \cdot GOV_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. GOV represents the governance factor for IND, CEO_N_CHAIR, SIZE, and CEO_N_COMP. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Factor and principal-components analysis on governance variables

Variable	Factor analysis	Principal components analysis
Factor loadings:		
IND	0.242	0.317
CEO_N_CHAIR	0.597	0.556
BOD_SMALL	-0.501	-0.524
CEO_N_COMP	0.623	0.562
Eigenvalue:		
GOV	1.05	1.74

Panel B: Cross-sectional regression of changes in cash compensation on revaluations and governance factor

Variable	Predicted Sign	Factor analysis	Principal components analysis
Intercept	?	0.173 (1.33)	0.173 (1.33)
ΔEARN	+	0.002 (0.02)	0.007 (0.07)
EARN	+	0.167 (2.05)**	0.164 (2.05)**
RET	+	0.009 (0.12)	0.010 (0.12)
GL_HC	+	0.957 (2.11)**	0.962 (2.13)**
PERM_REVAL	+	0.350 (2.32)**	0.370 (2.38)***
GL	?	0.143 (0.18)	0.141 (0.17)
REVAL	+	0.462 (4.31)***	0.460 (4.21)***
GOV	?	-0.043 (-1.20)	-0.027 (-1.28)
REVAL • GOV	+	0.360 (2.41)***	0.210 (2.41)***
YEAR indicators?		Yes	Yes
Clustering by firm?		Yes	Yes
N		445	445
Adjusted R^2		0.123	0.122

Table 21

Regressing Changes in Cash Compensation on Revaluations and Objectivity/Verifiability Factors

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \sum \omega \, OV_{i,t} + \sum \omega \; REVAL_{i,t} \cdot OV_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the average for the year. OV represents a vector of objectivity/verifiability factors for EXT, BIGN, IND, CEO_N_CHAIR, SIZE, CEO_N_COMP, and BIAS_LOW. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Factor and principal-components analysis on objectivity/verifiability variables

Variable	Factor analysis		Principal components analysis		
	1	2	1	2	3
Factor loadings:					
EXT	0.067	0.025	0.070	0.286	0.549
BIGN	1.000	-0.000	0.247	0.679	-0.076
IND	0.268	0.220	0.369	0.482	0.048
CEO_N_CHAIR	-0.036	0.625	0.502	-0.371	0.063
BOD_SMALL	-0.112	-0.486	-0.507	0.127	0.057
CEO_N_COMP	0.092	0.606	0.535	-0.228	0.001
BIAS_LOW	-0.050	-0.019	-0.049	-0.136	0.827
Eigenvalues:					
Oversight	1.10			1.20	
CEO Power		1.04	1.79		
Estimate quality					1.01

Panel B: Cross-sectional regression of changes in cash compensation on revaluations and objectivity/verifiability factors

Variable	Predicted Sign	Factor analysis	Principal components analysis
Intercept	?	0.185 (1.44)	0.182 (1.43)
ΔEARN	+	0.010 (0.10)	0.068 (0.72)
EARN	+	0.157 (1.76)**	0.124 (1.43)*
RET	+	0.010 (0.13)	0.013 (0.16)
GL_HC	+	0.967 (2.19)**	1.015 (2.37)***
PERM_REVAL	+	0.403 (2.65)***	0.497 (3.04)***
GL	?	0.096 (0.12)	0.138 (0.17)
REVAL	+	0.439 (4.06)***	0.401 (3.70)***
Oversight	?	-0.036 (-2.25)**	-0.025 (-1.86)*
REVAL • Oversight	+	0.067 (0.68)	-0.041 (-0.36)
CEO power	?	-0.043 (-1.18)	-0.031 (-1.60)
REVAL • CEO power	+	0.373 (2.17)**	0.183 (2.28)**
Estimate quality	?		-0.018 (-1.44)
REVAL • Estimate quality	+		0.181 (3.01)***
YEAR indicators?		Yes	Yes
Clustering by firm?		Yes	Yes
N		445	445
Adjusted R^2		0.127	0.131

Table 22

Regressing Changes in Cash Compensation on Positive and Negative Revaluations

The regression model is:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 \Delta EARN_{\_i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL/REVAL\_ADJ_{i,t} + \beta_8 REVAL/REVAL\_ADJ_{i,t} \cdot NEG_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

ΔCOMP is the percentage change in CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. REVAL_ADJ is the industry-adjusted revaluations. NEG=1 when REVAL or REVAL_ADJ is < 0. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Variable	Predicted sign	Using REVAL	Using REVAL_ADJ
Intercept	?	0.171	0.255
		(1.36)	(1.96)*
ΔEARN	+	0.039	0.028
		(0.32)	(0.31)
EARN	+	0.179	0.081
		(2.19)**	(0.93)
RET	+	0.034	0.069
		(0.40)	(0.83)
GL_HC	+	0.883	1.037
		(1.86)**	(2.25)**
PERM_REVAL	+	0.361	0.261
		(2.16)**	(1.40)*
GL	?	0.297	-0.016
		(0.34)	(-0.02)
REVAL/REVAL_ADJ	+	0.397	0.273
		(3.25)***	(8.67)***
NEG	?	-0.030	-0.069
		(-0.59)	(-2.47)**
REVAL/REVAL_ADJ • NEG	?	-0.314	-0.194
		(-0.62)	(-2.18)**
YEAR indicators?		Yes	Yes
Clustering by firm?		Yes	Yes
N		445	445
Adjusted R^2		0.092	0.131

Table 23

Regressing Levels of Cash Compensation on Revaluations

The regression model is:

$$COMP_{i,t} = \alpha_0 + \alpha_1 \Delta EARN_{i,t} + \alpha_2 EARN_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 GL\_HC_{i,t} + \alpha_5 PERM\_REVAL_{i,t} + \alpha_6 GL_{i,t} + \alpha_7 REVAL_{i,t} + \alpha_8 SIZE_{i,t} + \alpha_9 RISK_{i,t} + \alpha_{10} DE_{i,t} + \alpha_{11} TENURE_{i,t} + \alpha_{12} MTOB_{i,t} + \sum \omega_t YEAR_t + \varepsilon_{i,t}.$$

COMP is the natural log of CEO cash compensation. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. SIZE is the natural log of total assets. RISK is the variance of daily stock returns. DE is the debt to equity ratio. TENURE represents CEO tenure and is assigned a value of 1 if tenure is longer than the sample mean, and 0 otherwise. MTOB is the market-to-book ratio. YEAR represents a vector of year-specific indicator variables. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: Additional regression variables

Variables	N	Mean	Std. dev.	Min	Q1	Median	Q3	Max
COMP	445	12.524	0.689	10.800	12.067	12.567	12.960	14.737
SIZE	445	5.931	1.328	2.423	4.963	5.870	6.722	9.230
RISK	445	0.225	0.486	0.003	0.079	0.125	0.217	8.132
DE	445	1.185	1.064	0.023	0.667	0.900	1.270	7.348
TENURE	445	0.443	0.497	0	0	0	1	1
MTOB	445	0.763	0.257	0.061	0.616	0.753	0.913	1.600

Panel B: Cross-sectional regression of levels of cash compensation on revaluations

Variable	Predicted Sign	1	2	3	4	5
Intercept	?	10.44 (35.12)***	10.43 (35.01)***	10.37 (36.01)***	10.162 (80.40)***	10.353 (35.89)***
ΔEARN	+	-0.058 (-0.86)	-0.083 (-1.30)	-0.136 (-1.75)	-0.090 (-0.81)	-0.172 (-2.08)
EARN	+	-0.292 (-1.89)	-0.274 (-1.74)	-0.245 (-1.57)	-0.472 (-3.37)	-0.221 (-1.37)
RET	+	-0.015 (-0.13)	-0.029 (-0.26)	-0.121 (-1.25)	-0.037 (-0.38)	-0.147 (-1.55)
GL_HC	+		0.895 (1.77)**		1.073 (3.00)***	0.972 (1.89)**
PERM_REVAL	+	1.684 (2.71)***	1.597 (2.53)***	1.478 (2.41)***	1.426 (2.80)***	1.363 (2.15)**
GL	?	0.275 (0.27)	0.189 (0.20)	0.380 (0.38)	0.120 (0.15)	0.297 (0.32)
REVAL	+			0.342 (2.01)**	0.291 (2.17)**	0.375 (2.17)**
SIZE	+	0.254 (6.42)***	0.253 (6.43)***	0.256 (6.52)***	0.284 (16.01)***	0.255 (6.53)***
RISK	+	-0.023 (-0.39)	-0.013 (-0.23)	-0.012 (-0.22)	-0.002 (-0.04)	0.000 (0.01)
DE	+	0.060 (1.50)*	0.058 (1.52)*	0.065 (1.66)*	0.056 (2.38)***	0.063 (1.68)**
TENURE	+	0.199 (2.07)**	0.178 (1.94)**	0.191 (2.01)**	0.371 (7.77)***	0.168 (1.85)**
MTOB	+	0.553 (2.89)***	0.584 (3.03)***	0.579 (3.20)***	0.555 (5.57)***	0.616 (3.41)***
YEAR indicators?		Yes	Yes	Yes	No	Yes
Clustering by firm?		Yes	Yes	Yes	No	Yes
N		445	445	445	445	445
Adjusted R^2		0.571	0.576	0.575	0.548	0.582

Table 24

Modeling Endogenous Choice of Factors Affecting Objectivity and Verifiability

The regression model based on endogenous choice of FACTOR is:

$$\text{LN }(COMP)_{i,t,j} - \text{LN }(COMP)_{i,t-1,j} = \beta_0 + \beta_1 \Delta EARN_{i,t,j} + \beta_2 EARN_{i,t,j} + \beta_3 RET_{i,t,j} + \beta_4 GL\_HC_{i,t,j} + \beta_5 PERM\_REVAL_{i,t,j} + \beta_6 GL_{i,t,j} + \beta_7 REVAL_{i,t,j} + \sum \omega_t YEAR_{t,j} + \varepsilon_{i,t,j}.$$

FACTOR takes a value of $j = 1$ when FACTOR is present or $j = 0$ when the FACTOR is absent. The model separately estimates each coefficient for $j = 1$ and $j = 0$.

The selection model for FACTOR is:

$$FACTOR_{i,t} = \delta\left(\Delta COMP_{i,t,0} - \Delta COMP_{i,t,1}\right) + \beta_0 + \beta_1 \Delta EARN_{i,t} + \beta_2 EARN_{i,t} + \beta_3 RET_{i,t} + \beta_4 GL\_HC_{i,t} + \beta_5 PERM\_REVAL_{i,t} + \beta_6 GL_{i,t} + \beta_7 REVAL_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 DE_{i,t} + \beta_{10} RISK_{i,t} + \beta_{11} INSIDER\_HOLD_{i,t} + + \beta_{12} SD_{i,t} + \upsilon_{i,t}.$$

The model simultaneously estimates the three above equations using maximum likelihood. FACTOR represents EXT, BIGN, IND, CEO_N_CHAIR, BOD_SMALL, CEO_N_COMP, and BIAS_LOW. EXT takes a value of 1 if an external appraiser is used for all years for > 90% of investment properties. BIGN takes a value of 1 if a Big N audit firm is used. IND takes a value of 1 if the percentage of independent directors is greater than the sample median. CEO_N_CHAIR takes a value of 1 if the CEO is not the chairman. BOD_SMALL takes a value of 1 if the number of directors is less than the sample median. CEO_N_COMP takes a value of 1 if the CEO is not a member of the compensation committee. BIAS_LOW takes a value of 0 if the absolute value of investment property gains/losses (GL) is greater than the industry average for the year. The instruments used in the selection equation are: SIZE, DE, RISK, INSIDER_HOLD, and SD. SIZE is the natural log of total assets. DE is the debt to equity ratio. RISK is the variance of daily stock returns. INSIDER_HOLD is the percentage of outstanding stock held by the BOD insiders. SD is the secured debt to total assets ratio. LN(COMP)_{t-1} - LN(COMP)_{t} is the change in the natural logarithm of cash compensation from year *t*-1 to year *t*. ΔEARN is the change in core earnings after tax. EARN is the core earnings after tax. RET is the annual stock return. GL_HC is the amount of past revaluations recognized on investment property sales. PERM_REVAL are the recognized impairments in the value of investment properties. GL is the gain/loss on sales of investment properties relative to fair value. REVAL is revaluations of investment properties. ΔEARN , EARN, GL_HC, PERM_REVAL, GL, and REVAL are scaled by opening market value. All non-indicator regression variables are winsorized at the 1st and 99th percentiles. The related *t*-statistics, using White's heteroskedasticity-consistent estimator, are in parentheses. When directional predictions are made, *t*-statistics are one-tailed; *t*-statistics are two-tailed when no directional prediction is made. Regression coefficients are marked with *, **, *** to represent significance at 10%, 5%, and 1% respectively.

Panel A: External appraiser

Variable	Predicted Sign: EXT/Δ in LN(COMP)	EXT	LN(COMP), EXT=0	LN(COMP), EXT=1
Intercept	?/?	-1.344 (-1.57)	0.195 (1.15)	0.012 (0.20)
ΔEARN	?/+	0.273 (0.84)	0.097 (1.30)*	0.136 (2.10)**
EARN	?/+	2.651 (2.37)**	0.067 (0.49)	-0.003 (-0.02)
RET	?/+	-0.005 (-0.03)	0.012 (0.10)	0.067 (1.07)
GL_HC	?/+	2.361 (1.70)*	0.587 (1.46)*	0.764 (2.56)***
PERM_REVAL	?/+	-3.830 (-1.10)	0.892 (4.62)***	0.228 (1.33)*
GL	?/?	2.110 (0.71)	1.294 (2.15)**	-0.141 (-0.24)
REVAL	?/+	-0.557 (-1.01)	0.049 (0.40)	0.358 (4.26)***
SIZE	+/NA	0.313 (2.90)***		
DE	?/NA	0.046 (0.29)		
RISK	?/NA	-0.027 (-0.19)		
INSIDER_HOLD	-/NA	1.485 (1.37)		
SD	+/NA	-0.588 (-0.52)		
YEAR indicators?		No	Yes	Yes
Clustering by firm?		Yes	Yes	Yes
N				445
Wald χ^2 (*p*-value)				2735.60 (<0.0001)
Rho (EXT=0) (std err)				-0.06 (0.333)
Rho (EXT=1) (std err)				0.33 (0.273)
Wald test of independent equations χ^2 (*p*-value)				1.30 (0.522)
T-test of REVAL for EXT=1 > EXT=0 (one-tailed *p*-value)				2.13 (0.017)
Sargan overidentification test (*p*-value)				1.24 (0.743)

Panel B: Big N auditor

Variable	Predicted Sign: BIGN/ Δ in LN(COMP)	BIGN	LN(COMP), BIGN=0	LN(COMP), BIGN=1
Intercept	?/?	-1.646 (-1.72)*	0.161 (2.13)**	0.068 (3.56)***
ΔEARN	?/+	0.411 (1.32)*	-0.104 (-1.85)	0.096 (1.71)**
EARN	?/+	-0.109 (-0.22)	-0.081 (-0.72)	0.120 (1.05)
RET	?/+	0.104 (0.57)	0.317 (2.16)**	-0.048 (-1.11)
GL_HC	?/+	-0.593 (-0.43)	0.710 (1.50)*	0.543 (1.91)**
PERM_REVAL	?/+	2.389 (1.66)*	0.079 (0.38)	0.689 (1.63)*
GL	?/?	1.565 (0.57)	0.775 (1.28)	0.053 (0.09)
REVAL	?/+	-0.867 (-1.60)	0.018 (0.15)	0.374 (3.90)***
SIZE	+/NA	0.460 (3.17)***		
DE	?/NA	0.104 (0.68)		
RISK	?/NA	0.498 (1.14)		
INSIDER_HOLD	-/NA	-1.267 (-1.22)		
SD	+/NA	-0.534 (-0.61)		
YEAR indicators?		No	No	No
Clustering by firm?		Yes	Yes	Yes
N				445
Wald χ^2 (*p*-value)				30.55 (0.0001)
Rho (BIGN=0) (std err)				0.21 (0.200)
Rho (BIGN=1) (std err)				0.06 (0.175)
Wald test of independent equations χ^2 (*p*-value)				1.28 (0.526)
T-test of REVAL for BIGN=1 > BIGN=0 (one-tailed *p*-value)				1.91 (0.028)
Sargan overidentification test (*p*-value)				2.97 (0.397)

Panel C: BOD independence

Variable	Predicted Sign: IND/ Δ in LN(COMP)	IND	LN(COMP), IND=0	LN(COMP), IND=1
Intercept	?/?	-0.166 (-0.26)	0.141 (0.95)	-0.130 (-1.20)
ΔEARN	?/+	-0.092 (-0.23)	-0.088 (-1.28)	0.171 (0.99)
EARN	?/+	0.979 (1.77)*	0.039 (0.49)	0.183 (0.76)
RET	?/+	-0.110 (-0.61)	0.087 (1.12)	-0.043 (-0.41)
GL_HC	?/+	0.227 (0.15)	0.895 (2.50)***	0.148 (0.55)
PERM_REVAL	?/+	-2.002 (-1.30)	-0.061 (-0.42)	1.288 (2.34)***
GL	?/?	6.055 (1.83)*	-0.228 (-0.31)	1.452 (1.85)*
REVAL	?/+	-0.054 (-0.11)	0.205 (2.26)**	0.362 (2.89)***
SIZE	+/NA	-0.002 (-0.02)		
DE	?/NA	0.196 (2.06)**		
RISK	?/NA	-0.220 (-0.75)		
INSIDER_HOLD	-/NA	-3.370 (-3.38)***		
SD	+/NA	-0.305 (-0.53)		
YEAR indicators?		No	Yes	Yes
Clustering by firm?		Yes	Yes	Yes
N				445
Wald χ^2 (*p*-value)				74.36 (<0.0001)
Rho (IND=0) (std err)				-0.53 (0.353)
Rho (IND=1) (std err)				0.59 (0.265)
Wald test of independent equations χ^2 (*p*-value)				3.34 (0.188)
T-test of REVAL for IND=1 > IND=0 (one-tailed *p*-value)				1.03 (0.151)
Sargan overidentification test (*p*-value)				2.69 (0.442)

Panel D: CEO not acting as chairman

Variable	Predicted Sign: CEO_N_CHAIR/ Δ in LN(COMP)	CEO_N_CHAIR	LN(COMP), CEO_N_CHAIR=0	LN(COMP), CEO_N_CHAIR=1
Intercept	?/?	0.278 (0.70)	-0.235 (-3.05)***	0.036 (1.09)
ΔEARN	?/+	0.235 (0.70)	-0.001 (-0.01)	0.121 (1.51)*
EARN	?/+	1.838 (2.91)***	-0.179 (-1.46)	-0.022 (-0.15)
RET	?/+	0.120 (0.52)	-0.082 (-0.89)	0.045 (0.74)
GL_HC	?/+	-0.335 (-0.19)	0.609 (1.10)	0.608 (2.45)***
PERM_REVAL	?/+	-0.136 (-0.09)	1.233 (3.15)***	0.135 (0.78)
GL	?/?	8.206 (2.47)**	-0.618 (-0.55)	0.545 (0.94)
REVAL	?/+	0.360 (0.68)	-0.175 (-0.93)	0.446 (6.00)***
SIZE	+/NA	0.008 (0.15)		
DE	?/NA	0.080 (0.80)		
RISK	?/NA	0.419 (2.28)**		
INSIDER_HOLD	-/NA	-0.694 (-1.13)		
SD	+/NA	-0.027 (-0.06)		
YEAR indicators?		No	No	No
Clustering by firm?		Yes	Yes	Yes
N				445
Wald χ^2 (*p*-value)				18.96 (0.0083)
Rho (CEO_N_CHAIR=0) (std err)				-0.96 (0.019)
Rho (CEO_N_CHAIR=1) (std err)				0.198 (0.243)
Wald test of independent equations χ^2 (*p*-value)				52.27 (<0.0001)
T-test of REVAL for CEO_N_CHAIR=1 > CEO_N_CHAIR=0 (one-tailed *p*-value)				3.72 (0.0001)
Sargan overidentification test (*p*-value)				1.93 (0.586)

Panel E: BOD size

Variable	Predicted Sign: BOD_SMALL/ Δ in LN(COMP)	BOD_SMALL	LN(COMP), BOD_SMALL=0	LN(COMP), BOD_SMALL=1
Intercept	?/?	1.619 (2.18)**	0.157 (0.93)	0.210 (3.10)***
ΔEARN	?/+	0.401 (0.79)	0.337 (2.08)**	-0.081 (-1.39)
EARN	?/+	-1.117 (-1.22)	-0.040 (-0.22)	0.231 (2.35)***
RET	?/+	-0.208 (-0.79)	0.006 (0.08)	0.139 (1.78)**
GL_HC	?/+	1.997 (1.57)	0.501 (1.97)**	0.354 (1.17)
PERM_REVAL	?/+	-7.742 (-1.45)	2.101 (1.91)**	0.713 (2.73)***
GL	?/?	-2.983 (0.89)	1.275 (1.62)	0.560 (1.00)
REVAL	?/+	0.586 (1.37)	0.308 (3.52)***	0.183 (1.46)*
SIZE	+/NA	-0.454 (-3.85)		
DE	?/NA	0.232 (1.75)*		
RISK	?/NA	0.115 (1.04)		
INSIDER_HOLD	-/NA	2.005 (1.94)		
SD	+/NA	-0.130 (-0.19)		
YEAR indicators?		No	Yes	Yes
Clustering by firm?		Yes	Yes	Yes
N				445
Wald χ^2 (*p*-value)				169.11 (<0.0001)
Rho (BOD_SMALL=0) (std err)				-0.11 (0.090)
Rho (BOD_SMALL=01) (std err)				-0.60 (0.272)
Wald test of independent equations χ^2 (*p*-value)				4.19 (0.123)
T-test of REVAL for BOD_SMALL=1 > BOD_SMALL=0 (one-tailed *p*-value)				0.81 (0.791)
Sargan overidentification test (*p*-value)				1.17 (0.761)

Panel F: CEO not serving on compensation committee

Variable	Predicted Sign: CEO_N_COMP/ Δ in LN(COMP)	CEO_N_COMP	LN(COMP), CEO_N_COMP=0	LN(COMP), CEO_N_COMP=1
Intercept	?/?	-0.071 (-0.07)	0.149 (1.09)	0.054 (2.91)***
ΔEARN	?/+	0.129 (0.50)	0.055 (0.26)	0.000 (0.00)
EARN	?/+	-0.919 (-1.11)	0.091 (0.14)	0.163 (2.59)***
RET	?/+	0.326 (1.82)*	0.024 (0.17)	0.034 (0.61)
GL_HC	?/+	0.327 (0.27)	-0.884 (-3.03)	0.636 (2.01)**
PERM_REVAL	?/+	-3.926 (-1.56)	-4.967 (-2.27)	0.522 (1.97)**
GL	?/?	1.458 (0.65)	1.513 (0.97)	0.315 (0.60)
REVAL	?/+	-0.414 (-0.61)	0.010 (0.06)	0.383 (5.02)***
SIZE	+/NA	0.205 (1.42)*		
DE	?/NA	-0.344 (-1.66)*		
RISK	?/NA	0.287 (0.71)		
INSIDER_HOLD	-/NA	-2.283 (-1.55)*		
SD	+/NA	2.350 (2.00)**		
YEAR indicators?		No	No	No
Clustering by firm?		Yes	Yes	Yes

N	445
Wald χ^2 (*p*-value)	98.13 (<0.0001)
Rho (CEO_N_COMP=0) (std err)	0.10 (0.291)
Rho (CEO_N_COMP=1) (std err)	0.15 (0.210)
Wald test of independent equations χ^2 (*p*-value)	0.60 (0.741)
T-test of REVAL for CEO_N_COMP=1 > CEO_N_COMP=0 (one-tailed *p*-value)	1.60 (0.055)
Sargan overidentification test (*p*-value)	0.26 (0.968)

Panel G: Estimation bias is low

Variable	Predicted Sign: BIAS_LOW/ Δ in LN(COMP)	BIAS_LOW	LN(COMP), BIAS_LOW=0	LN(COMP), BIAS_LOW=1
Intercept	?/?	0.918 (2.12)**	0.266 (0.75)	0.031 (0.69)
ΔEARN	?/+	-0.846 (-1.68)*	-0.094 (-0.47)	0.095 (1.41)*
EARN	?/+	0.830 (1.78)*	0.604 (3.37)***	0.074 (0.74)
RET	?/+	-0.210 (-0.78)	0.179 (1.12)	0.024 (0.42)
GL_HC	?/+	-2.332 (-1.86)*	1.220 (2.38)***	0.381 (1.45)*
PERM_REVAL	?/+	-25.502 (-1.91)*	37.610 (4.63)***	0.443 (2.02)**
GL	?/?	-4.457 (-0.92)	-1.258 (-1.27)	0.878 (1.19)
REVAL	?/+	0.320 (0.67)	0.277 (1.19)	0.303 (3.92)***
SIZE	+/NA	-0.014 (-0.23)		
DE	?/NA	0.122 (1.00)		
RISK	?/NA	0.044 (0.42)		
INSIDER_HOLD	-/NA	0.344 (0.49)		
SD	+/NA	-0.431 (-1.05)		
YEAR indicators?		No	Yes	Yes
Clustering by firm?		Yes	Yes	Yes

N	445
Wald χ^2 (*p*-value)	189.41 (<0.0001)
Rho (BIAS_LOW=0) (std err)	-0.09 (0.877)
Rho (BIAS_LOW=1) (std err)	0.56 (0.189)
Wald test of independent equations χ^2 (*p*-value)	5.31 (0.070)
T-test of REVAL for BIAS_LOW=1 > BIAS_LOW=0 (one-tailed *p*-value)	0.14 (0.446)
Sargan overidentification test (*p*-value)	2.47 (0.482)