

## **Executive Pensions: Complements or Substitutes?**

Lisa Goh

London School of Economics and Political Science

Email: [l.goh@lse.ac.uk](mailto:l.goh@lse.ac.uk)

Yong Li

King's College London

Email: [yong.li@kcl.ac.uk](mailto:yong.li@kcl.ac.uk)

### **ABSTRACT**

This study investigates pensions as an element of total executive compensation, and their role in the overall compensation package. It also examines the relationship between pensions and more visible and performance-sensitive forms of compensation such as bonuses and equity. Using a sample of FTSE 100 executives from 2004–2008, the study presents evidence of complex pension arrangements awarded to executives in the UK, and finds that they are an economically significant component of pay, adding on average 17% to the total pay package. The study finds that CEO pensions are negatively related to bonuses in both cross-sectional and time-series settings, suggesting that pensions function as both a passive and dynamic substitute for more transparent and visible forms of compensation. The finding of a dynamic substitution effect between pensions and bonuses is consistent with the managerial power hypothesis, shedding new light on the competing optimal contracting and managerial power views of executive pay. Our findings suggest that greater attention should be paid to pensions by investors and corporate governance regulators, and highlight the need to standardize and enhance the quality of disclosures for this important element of executive pay.

*Keywords:* Corporate Governance, Executive Compensation, Pensions, Bonuses, Rent Extraction

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## **Executive Pensions: Complements or Substitutes?**

### **INTRODUCTION**

The current economic crisis has heightened public policy makers' concerns about the compensation of chief executive officers and other top executives of large publicly traded companies. Important questions have been raised on the incentive effects, structure and methods of executive compensation (Bebchuk, Cohen and Spamann, 2010). In this paper, we examine the role of executive pensions, a previously neglected element of total executive compensation, within the structure of the overall compensation package.

The role of pensions has come under increased public scrutiny after a series of recent high-profile corporate failures (Daily Telegraph, 2009a; The Independent, 2009). These incidents have also highlighted the economic significance of executive pension payouts.<sup>1</sup> Leading institutional investors in the UK, such as the Association of British Insurers (ABI), have expressed concerns about executive pension contracts and the potential for pension payouts on termination as a way of providing rewards for failure (PIRC, 2010).

Despite the prevalence of pensions in executive pay, pensions have been largely ignored in prior academic research. This is likely attributable to the lack of available data on executive pensions (Sundaram and Yermack, 2007). The most commonly used compensation database in the United States, Execucomp, has collected data on executive pension transfer values only since 2007, following new Securities and Exchange Commission (SEC) disclosure requirements. Therefore, in several studies on US executives, researchers have resorted to constructing their

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<sup>1</sup> There was public outrage on disclosure of Sir Fred Goodwin's £16.6 million pension, after he was asked to resign as CEO of the Royal Bank of Scotland Group, which had been nationalized in October 2008 during the financial crisis. It was also only following the resignation of Tony Hayward, CEO of BP, during the Deepwater Horizon oil spill disaster, that the public realized his pension would begin almost immediately, with a total value of over £11 million.

own estimates of pension values for individual executives (Antle and Smith, 1985; Bebchuk and Jackson, 2005; Sundaram and Yermack, 2007; Kalyta and Magnan, 2008).

Using estimated executive pension value data, recent US-based research has suggested that pensions, in particular defined benefit pensions, play an important role in efficient contracting. The standard principal-agent analysis of executive compensation posits that compensation is chosen in a manner to maximize firm value and provide efficient incentives, subject to contracting restrictions. As such, pensions as a very long-term element of compensation represent “inside debt”, which helps align interests of executives and debt holders, thus reducing overly risky actions from equity incentives (Sundaram and Yermack, 2007; Edmans and Liu, 2011). However, the optimal contracting view does not address the effect of opaque disclosure on the magnitude of the total executive pension and the level of total executive pay.

A competing “managerial power” view suggests that executive pay contracts are sub-optimal and that the non-disclosure of pensions facilitates rent-extraction (see Bebchuk and Fried, 2004). Lack of disclosure permits firms to obscure large amounts of largely performance-insensitive compensation. The managerial power approach would therefore propose that pensions to executives represent a form of “stealth compensation,” which are particularly susceptible to managerial power forces, given their relative poor disclosures and complexity to value. The global financial crisis and revisions to the UK Corporate Governance Code (2010) have further intensified the debate about pension payouts as a method of compensation among academics, public policy makers, and the financial industry. Empirical examination of the executive pension as a component of the total compensation package and its relationship with performance-sensitive pay elements will provide important insights to the debate.

Motivated by the need to understand the role of the pension in compensation, and the limited evidence from prior empirical research, we first examine whether executive pensions are complementary or substitutive in relation to the rest of the compensation package. Under the managerial power view, one would expect lower total visible compensation (defined as the commonly used measure of salary, bonus, option grants, and restricted shares) to be systematically associated with higher amounts of opaque forms of compensation such as pensions. Our first test therefore focuses on the extent to which the magnitude of executive pensions is associated with the level of residual compensation. Residual compensation is defined as actual compensation less a measure of expected compensation, which is predicted using a set of economic determinants (Core, Holthausen and Larker, 1999; Core, Guay and Larker, 2008).

Our second research question investigates whether changes in executive pensions are systematically related to changes in performance-sensitive elements of compensation, such as bonuses, in particular when these decrease. The managerial power approach hypothesizes that pensions function as a less-visible mechanism to compensate for underperformance, while under an optimal contracting view, pensions as inside debt mitigate agency costs, and there should be no *ex ante* reason for pensions to be sensitive to bonuses. Our second test consequently focuses on the dynamic association between changes in bonuses and pensions.

The UK institutional environment provides an ideal setting to address our research questions for a number of reasons, including pension transfer rights, the high prevalence of pensions in executive pay, their economic significance, and disclosure requirements.

First, debt-based incentives to reduce risk are mitigated in the UK by the possibility for individuals to transfer their defined benefit pension entitlements out of the firm's pension plan and into other pension plans (e.g., including defined contribution plans and approved foreign

pension plans). This suggests that inside debt incentives provided by pensions under optimal contracting can be to some extent circumvented, particularly when there is concern over the health of the firm, its pension fund, or the ability of the firm to fund future pension fund deficits, though we do not know the frequency of this practice. While we observe few cases in our data collection of executives transferring their pension entitlements into private plans, transfers made by executives subsequent to leaving the board are not disclosed. Furthermore, the government pension protection guarantees are limited to approximately £30,000 per year (as of April 2011), and most of UK executives would be well over this limit.<sup>2</sup> The UK thus presents a setting where debt-based contracting incentives may be weakened, and where predictions of the managerial power hypothesis are likely to dominate the role that executive pension may play in the total compensation package.

We are also motivated to study the UK setting due to the level of disclosure required relating to pensions. In the UK, since 2003 there has been a comprehensive disclosure regime in place, which requires disclosures about the monetary value of executive pension plans. These figures are calculated in accordance with actuarial guidance notes and are subject to audit. However, considerable expertise is required to comprehend the pension disclosures and to value the pension component of compensation, due to both the complexity and variety of pension arrangements, many involving multiple pension components (e.g. defined benefit plans, defined contribution plans, and salary supplements), which may be both approved and unapproved, and funded and unfunded. Evaluation of their economic significance and incentive effects is further complicated by the non-uniformity in disclosure location and presentation format within remuneration reports. Different types of pension compensation are often tabulated or described

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<sup>2</sup> Some public evidence of this has been documented in cases such as pilots of British Airways, who were reported in 2009 to be transferring millions out of the company's defined benefit pension plan, amid concerns that the firm would not be able to meet its future pension obligations (Daily Telegraph, 2009b).

in different sections of the same compensation report, and are often not included in the primary compensation table, or are described in dense narrative. The overall complexity and unwieldiness of compensation reports in the UK has drawn increasing criticism and is now subject to regulatory inquiry on ways to improve disclosure and presentation of information in a clear and concise manner (FRC, 2009; BIS 2011). The lack of standardized disclosure related to pension values is likely to contribute to the opacity of pension compensation for UK executives in terms of their significance and magnitude, and an incomplete view of the total compensation package.

We examine our research questions using a hand-collected sample of the largest UK FTSE-listed firms over a five-year period. On a cross-sectional basis, we find that the level of pension compensation paid to executives is negatively and significantly related to residual compensation, where executives with lower compensation packages (excluding pension) have relatively higher pensions, and executives with higher compensation packages have relatively lower pensions. With further segmentation of the compensation package, we find a persistent negative relationship between total pension increments and performance-based bonuses awarded to executives during the year.<sup>3</sup> This suggests that there is a trade-off between pensions and other, more visible and performance-sensitive, elements of compensation. We find some weak evidence that when corporate governance structures are less effective, CEOs are awarded with greater pensions. On a time-series basis, we find further evidence consistent with the managerial power hypothesis that a decrease in bonuses awarded during the year is associated with a greater increase in pension benefits.

Our study contributes to, and extends, prior executive compensation research in several ways. First, we contribute to extant debate on the optimal contracting and managerial power

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<sup>3</sup> We use the term “pension increment” to refer to the total pension granted to or earned by the executive during the fiscal year.

views of executive compensation by examining whether compensation may be attenuated by “opaque” elements of compensation, such as pensions. We provide new evidence of the substitutive effect between opaque pension allotments and more visible performance-sensitive elements of total executive pay, notably bonuses, both on a cross-sectional basis, and a dynamic basis. Our findings suggest that it is possible for pensions to be used as a mechanism for rent extraction.

Second, we provide a comprehensive overview of the use of executive pensions in the UK. Our evidence suggests that UK executive pension provisions have evolved into complex arrangements, with many individual executives being awarded multiple pension elements. Last, since UK regulations require detailed and audited disclosures on pension increases and actuarial values, our hand-collected dataset of disclosed actuarial values reduces noise arising in earlier studies that estimate pension values, and result in more precise and comprehensive measures of total pensions granted to executives.<sup>4</sup> Our overall pension measure is based on all measures identified by companies as pension-related, including changes in transfer values of defined benefit plans, annual contributions to defined contribution or money purchase plans, cash salary supplements made by firms during the year in addition to, or in lieu of, pension plans, and any combination of the above.

The next section synthesizes related literature, provides details on regulatory requirements governing executive pension arrangements in the UK, and formulates the hypotheses. The third section explains our research design and the data. We then present our results, and conclude by summarizing our findings and discussing policy implications.

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<sup>4</sup> Prior US-based research is limited by the lack of information on executive pensions prior to the SEC’s expansion of disclosure requirements at the end of 2006. In the absence of full disclosure, a number of US-based studies have relied on researchers’ own estimates about pension values (Sundaram and Yermack, 2007; Bebchuck and Jackson, 2005; Gerakos, 2010). By contrast, in the UK setting the value of executive pensions are disclosed in firms’ annual reports. These figures are calculated in accordance with actuarial guidance notes and are subject to audit.

## **LITERATURE, INSTITUTIONAL CONTEXT, AND HYPOTHESIS DEVELOPMENT**

### **The role of pensions in executive compensation**

An increasing amount of anecdotal evidence suggests that executive pensions can constitute a significant proportion of executive compensation.<sup>5</sup> Bebchuk and Jackson (2005) was one of the early academic studies to examine pension benefits of executives. They find that pension benefits paid to US executives are economically significant, with an estimated mean total actuarial value of \$17.1 million among the 51 CEOs in their sample. Sundaram and Yermack (2007) estimate that the annual increases in pensions constitute approximately 10% of total compensation for a larger sample of 237 US CEOs, and find that pension holdings become more significant as executives approach retirement age, with a corresponding decrease in their equity holdings. In our study, we observe that the use of pension-related compensation for executives is widespread in the UK, with 97 percent of FTSE 100 executives receiving one or more forms of pension-related compensation during 2004 to 2008 period.

The labor-economics literature suggests that firms provide defined benefit pensions to their employees, including executives, for a number of reasons, such as bonding them to the firm, and mitigating shirking. Pension provisions reduce employee turnover, as employees have a vested interest in remaining at the firm until retirement age (Ippolito, 1991; Gustman, Mitchell, and Steiman, 1994). Consistent with labor-wage theory, we also observe labor market-related reasons for providing executives with pensions; for example, Diageo plc (2004) indicates that the objective of their executive pension plan is “to provide competitive postretirement compensation

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<sup>5</sup> We use the term “executive” to refer to a Chief Executive Officer (CEO) and other executives of UK firms. UK firms typically have a unitary board composed both of Executive and Non-executive directors, commonly referred to in the US as “inside” and “outside” directors, respectively. Our primary focus in this paper is on executives; we consider non-executives only as a governance mechanism in our empirical analyses.

and benefits, that reward long term sustained performance in the business.” This suggests that firms perceive pensions as an important part of the total executive compensation package, and are conscious of similar provisions offered by competing firms.

Pensions can play a role in aligning interests of executives with those of bondholders, an idea furthered by Sundaram and Yermack (2007) and Edmans and Liu (2011), who characterize defined benefit pensions as a form of inside debt, taking on characteristics of debt-holder claims. Like debt, a pension entitles the holder to a stream of pre-defined cash flows over a long period of time, which would also be at risk in case of company default. As a result, the presence of pensions as part of the executive compensation package could reduce debt-related agency problems related to risk-shifting.

Researchers have also framed the use of executive pensions as a mechanism of rent extraction. Bebchuk and Jackson (2005) suggest that pensions reduce risk for executives, in the case of defined benefit plans, shifting risk from the executive back to the company, which is responsible for investment decisions and funding levels. They also carry less risk than equity compensation, which increases the amount of undiversified risk borne by the individual. Bebchuk and Jackson also propose that pensions function as a mechanism of camouflage, or “stealth” compensation, since non-existent or poor quality disclosures on executive pensions reduce the level of total publicly observable compensation (see also Bebchuk and Fried, 2004). Such stealth compensation reduces potential criticism about over-compensation and non-performance-sensitive compensation, and provides a greater cushion from the potential “outrage” level, which would generate unwanted attention.

Existing empirical research on executive pensions yields rather mixed evidence on their role within the total executive pay package. Kalyta and Magnan (2008) provide empirical results

that are broadly consistent with a rent extraction view in the context of non-qualified Supplemental Executive Retirement Plans (SERPs) in a sample of Canadian firms. Kalyta and Magnan find that the use and size of SERPs are positively associated with CEO power, and that CEOs with greater power over the board use SERPs to extract additional compensation that is largely independent of performance. In contrast, Gerakos (2007) finds that economic contracting variables appear to explain defined benefit pension levels to a greater extent in the US than measures of CEO power. In a related study, Gerakos (2010) examines the relationship between executive pensions and total compensation (excluding pension benefits) in the US, finding that the use of the executive pensions is negatively related to the rest of the compensation package. He suggests that pensions are used or viewed as a trade-off to ordinary components of total pay. Furthermore, using a sample of US executives, Sundaram and Yermack (2007) find that the ratio of executive pension holdings to equity becomes markedly higher as executives get older, and that entitlement to pension payouts is a critical determinant of turnover and retirement.

### **Institutional arrangements in the UK**

In the UK, executives may be a member of an ordinary occupational pension scheme or a separate scheme for senior managers and executives. The key types of pension provisions offered to executives include (i) defined benefit pensions; (ii) defined contribution arrangements; (iii) an explicit cash salary supplement in lieu of pension; (iv) a mixture of defined benefit pensions, defined contribution pensions, and cash salary supplements; or (v) no pension provision. Defined benefit pensions are still the most common form of pension provision with approximately 42% of FTSE 100 executives on average in our sample being compensated with only defined benefit pension arrangements.

The design and provision of the executive pension plans differs in various aspects from occupational schemes for rank-and-file employees since executives receive significantly higher compensation than regular employees, but plans are largely governed by the same legislation as any other pension schemes. Many UK firms offer an occupational pension plan for their members (including executives), which are approved by the UK Pension Schemes Office, provided that contributions are within the limits set out by the HMRC (the UK tax authority). Similar to the US, UK tax legislation imposes an “earnings cap” for determining pension benefits under approved schemes.<sup>6</sup> Since many executives exceed the annual or lifetime limit, firms may have supplemental retirement plans which are not tax-registered, to top-up the approved, tax-deductible retirement benefits. These may take the form of additional contributions to a defined contribution plan, cash salary supplements, or additional defined benefit pension arrangements.<sup>7</sup>

Despite the prevalent use of executive pensions in the compensation package, compensation research in the UK has largely focused on cash and equity-based elements (Conyon and Murphy, 2000; Buck et al., 2003; Bruce et al., 2005; Stathopoulos et al., 2004). To our knowledge, Kabir and Minhat (2009) is the only study to examine pensions in the UK, finding lower pay-performance sensitivity when pensions are included in measures of total compensation. Pensions have been largely ignored in UK research since they have also gone uncollected by main data providers until very recently. The difficulty in collecting executive pension data may be related to the complex nature of pension arrangements and varying standards of corporate disclosures relating to these arrangements.

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<sup>6</sup> Effective from April 2006, the UK government introduced a new individual lifetime limit on the maximum pension benefit without being subject to tax. This maximum, known as standard lifetime allowance, was £1.6 million in 2006/07, the mid-point of our sample (reduced to £1.5 million during the 2011/12 tax year). The annual limit on tax-deductible pension savings was £215,000 in 2006/07 (now reduced to £50,000 from 2011/12 onwards).

<sup>7</sup> Additional defined benefit arrangements may take the form of Funded Unapproved Retirement Benefit Schemes (FURBS), or Unfunded Unapproved Retirement Benefit Schemes (URBS). These are similar in nature to Supplemental Executive Retirement Plans (SERPs), which are discussed in Sundaram and Yermack (2007) and Kalyta and Magnan (2008), in the US and Canadian settings, respectively.

Regulations governing executive pension disclosures in the UK have evolved with corporate governance codes on compensation and their disclosures. The Cadbury Committee (1992) recommended on a comply-or-explain basis that firms disclose the aggregated total compensation, including pension contributions, of the board, the chairperson, and the highest-paid executive. The Greenbury Report (1995) required UK firms to discuss their pension policy and to disclose the individual compensation levels and components for all executives, including pension entitlements and additional pension rights earned during the year.

The UK Combined Code on Corporate Governance (2000) indicated that pensions earned should be calculated using methods recommended by the Institute of Actuaries. Since 2003, UK executive pension disclosures have been governed by the Directors' Remuneration Report Regulations (2002), the revised Combined Code on Corporate Governance (2003), and the Financial Services Authority (FSA) Listing Rules. These require UK firms to disclose the audited actuarial present value (transfer value) of the total accrued pension as of the end of each fiscal year, and other related executive pension values for any directors who are involved in a company pension plan.<sup>8</sup> Appendix A provides examples of pension-related disclosures from compensation reports of several UK listed companies (part of their annual report).

In practice, unlike US firms, which now follow a standardized SEC template, we observe that UK firms adopt varying approaches to their pension disclosures.<sup>9</sup> Some UK firms tabulate defined contribution pensions and/or salary supplements in the primary compensation table,

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<sup>8</sup> These related audited executive pension values include accrued pension, change in accrued pension, both gross and net of inflation, change in actuarial transfer value during the year, and the actuarial present value (transfer value) of increases in annual pensions accrued during the year.

<sup>9</sup> In 2006, the US Securities and Exchange Commission (SEC) adopted new disclosure requirements on executive compensation, including pensions. From December 2006, US-listed firms have been required to disclose the increase in directors' total pension value, accrued pension benefits at the end of the year under qualified and non-qualified plans, as well as the total actuarial present value of the pension plan. This recent change in SEC disclosure requirement makes the US executive pension disclosure comparable to those in the UK, in a relatively more standardized format.

while others include them in the notes to the compensation table, in their discussion of compensation policy, or in a separate pension section of their compensation report, either in a table or narrative form. Defined benefit pensions in the UK are normally provided in a separate table from the primary compensation table. UK firms using multiple different forms of pension benefits may discuss each one in different sections of the compensation report. Such inconsistency and complexity in disclosure practices contributes further to the perceived opacity of executive pensions, and may contribute to them being overlooked by compensation researchers.<sup>10</sup> The discrepancy in pension disclosures is representative of a larger problem of complexity in UK compensation reporting. In the UK Financial Reporting Council's 2009 call to reform financial reporting, it identified remuneration reports as one area where "many users observe that remuneration reports are too dense to be useful" (FRC, 2009).<sup>11</sup>

## **Hypotheses**

The optimal contracting theory of executive compensation suggests that an equilibrium compensation policy provides an efficient set of incentives through a number of mechanisms, such as performance-based bonuses, salary raises, stock options, and performance-based dismissal decisions, which will incentivize the executive to maximize firm value (Jensen and Meckling, 1976; Grossman and Hart, 1983; Jensen and Murphy, 1990). More recent literature

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<sup>10</sup> In a review of the UK Directors' Remuneration Reporting Regulations in 2004 by Deloitte & Touche, 89% of survey respondents indicated that it was important or critical to understand pension arrangements in place for directors, while only 48% of respondents felt that disclosures were sufficient to understand pension arrangements. Only 15% of respondents felt that information provided was "fully sufficient", giving it the highest rating on the scale. Respondents suggested that "a clearer, standardized format" and disclosure of costs to the company would be helpful. This is consistent with our finding of significant inconsistency in disclosure (Deloitte, 2004).

<sup>11</sup> The recent UK government Business, Innovation, and Skills (BIS) department consultation focuses solely on compensation and in regards to disclosure states that "over time remuneration reports have become increasingly lengthy and complex. This has made it difficult to identify the main facts and figures, which are often buried in a raft of other information." Furthermore, "while there are some examples of best practice reporting there are many cases where the different elements of remuneration are reported in separate tables and spread across a lengthy report. As a result it can be difficult and time-consuming for shareholders to have a clear understanding of the total amounts paid to directors." (BIS, 2011)

has also examined the role of pensions as a part of this optimal package. Edmans and Liu (2011) characterize defined benefit pensions as a form of inside debt, and show that it can function as an optimal compensation component, providing executives with incentives to reduce agency costs of debt. Sundaram and Yermack (2007) find that US CEOs with higher pension wealth manage their firms more conservatively and have lower default risk. They also note that a theoretical framework is lacking which can address the possible optimality of pensions as inside debt in executive compensation.

Alternatively, the competing managerial power hypothesis adopts agency theory from the view of the wealth-maximizing manager, who aims to maximize his or her own wealth, at the expense of the firm (Bebchuk and Fried, 2004). It suggests that pensions provide a mechanism for firms to “camouflage” part of the compensation package, reducing the size of the publicly visible part of the compensation package and reducing potential outrage costs (Bebchuk and Jackson, 2005). Pensions further increase performance-insensitive compensation, because they are not linked to firm performance. Therefore, because pensions are less visible, and because they are less risky to the individual than performance-sensitive forms of compensation, a high-pension arrangement would be more favorable to the executive than a highly risky total compensation package. This implies that rational executives have an incentive to trade off performance-sensitive and insensitive elements of compensation within their total compensation package (Gerakos, 2010).

The UK provides us with a setting where the “managerial power” hypothesis is more clearly testable and one in which “inside debt” incentives are weakened. This may be the case in the UK for several reasons, in particular since executives may have the option to withdraw their debt before other claimholders (Anantharaman et al., 2011). First, members of approved UK

pension plans are entitled to receive 25% of their total pension value tax-free at the date of retirement, which reduces the total amount of the pension payout being deferred into the retirement period. Second, as noted earlier, executives are entitled to transfer their defined benefit pension entitlements out of the firm's pension plan into other approved private pension plans (such as a defined contribution arrangement), which are independent of the firm, and in which the executive chooses his or her own risk level. Such transfers are not subject to disclosure after individuals leave the firm and further reduce the time horizon for concern about pension funding levels. This is especially relevant for executives, who may have large pension entitlements, and need to be concerned about the ability of firms to make up any pension deficits in the future, since they are likely to be entitled to well above government pension guarantee limits of approximately £30,000 per year. Thus, the UK provides us with a setting where predictions from the "managerial power" hypothesis are likely to dominate, and we adopt its underlying theoretical framework to motivate the development of our hypotheses.

Before developing specific predictions under managerial power hypothesis, we take the first empirical step to examine how executive pensions relate to the rest of the compensation package, and whether the pensions function as a complement or substitute to more visible elements of compensation (salary, bonus, options, and long-term incentives), which are the traditional measures of compensation used by researchers (Murphy 1999; Jenter and Frydman, 2010). If pensions to executives function as a substitute for more visible compensation, one would observe that pensions are systematically higher for executives within firms that are perceived as offering lower total visible compensation package. Alternatively, if pensions function as a complement to more visible compensation, one would expect that pensions are also higher for executives with higher total visible pay. To capture such excess or deficiency in total

visible compensation, we follow Core et al. (2008) and compute a measure of residual compensation, which is the regression residual from estimating total visible compensation using a model determined by economic factors. The above discussion thus leads to the following prediction, after controlling for a mechanically positive pension-salary relationship:

*H<sub>1A</sub>: If executive pensions are substitutive to total visible compensation, the magnitude of executive pensions would be negatively related to residual compensation.*

While executives may prefer to substitute performance-sensitive elements of compensation for additional pension benefits, given their opacity and performance-insensitivity, they may not face the same incentive to reduce salary, given that it is fixed and other elements of compensation (including bonuses, equity, and pensions) are often calculated as a multiple of salary (Bender, 2007). We therefore refine  $H_{1A}$  above to examine only performance-sensitive elements of compensation and their associations with pensions:

*H<sub>1B</sub>: There is a negative relationship between bonuses and pensions.*

*H<sub>1C</sub>: There is a negative relationship between equity grants and pensions.*

Our first set of hypotheses frame the role of pensions relative to other parts of the compensation package without drawing conclusions about the optimality of such arrangements, even though pensions function as a less visible mechanism of compensation, and may be considered in many ways more favorable than equity or other performance-sensitive compensation. One caveat with our first set of tests is that a simple substitutive relationship between visible compensation and pensions can still be consistent with optimal contracting, since it reflects cross-sectional variation between firms with different types of compensation policies and may reflect an equilibrium level of total compensation, including pension. A high pension, in that case, might simply be compensating the executive for lower other (visible) compensation,

with the proportions being based on the firm's other characteristics or historic compensation policies.

Therefore, the next question is to investigate whether pensions can be used in certain settings to extract relatively more compensation, after allowing for an equilibrium pay package. The managerial power framework suggests that wealth-maximizing executives, combined with conflicts of interest and weak governance lead to higher or less performance-sensitive compensation (Bebchuk and Fried, 2004), with empirical results from studies on corporate governance (Core et al., 1999), compensation consultants (Murphy and Sandino, 2010; Voulgaris et al., 2010), and opportunistic timing of option grants (Yermack, 1997), among others.

We predict that pension elements of the executive pay package are likely to be higher in poorly-governed firms, since the cost of receiving performance-insensitive pension benefits to the CEO decreases as the CEO's power over the board increases. This leads to the following hypothesis:

*H<sub>2</sub>: Allowing for substitution effects, pensions are higher in less well-governed firms.*

The discussion above raises the interesting question of whether it is possible that pensions are exploited to compensate for declines in other elements of compensation, as pension elements of compensation are less visible, or can be camouflaged. Furthermore, the obfuscation around pensions relieves pressure on compensation committees to reduce total pay levels and bonuses, in particular in periods of poor performance, because they can be used as tools to offset decreases in visible elements of compensation. We would therefore predict, under a view of manager-influenced compensation, a dynamic substitution effect between declines in performance-sensitive bonuses and pension compensation. We have no predictions about a dynamic relationship with equity, since equity is a long-run instrument which has potential for

growth or recovery in subsequent periods. Building on the cross-sectional substitution effect discussed in  $H_1$  above, which implies a negative cross-sectional relationship between pension levels and performance-sensitive pay, we test the following “dynamic” substitution hypothesis:

*H<sub>3</sub>: There is an association between decreases in bonuses and increases in pensions.*

## RESEARCH METHOD

### Research Design

**Residual compensation and executive pensions.** Our analysis begins by estimating total visible compensation without pensions (*LogTotalPay*) in a model with economic determinants. We include the tenure of the executive on the board of directors (*LogTimeInBoard*), firm performance (*ROA* and *RETURN*), *Leverage*, *FirmSize* (measured as the log of the average total assets during the year), book-to-market ratio (*BookToMarket*), *Risk*, and percentage of performance-related compensation (*%Perform*). *BookToMarket* is the ratio of the book value of the firm to its market value, and is an inverse proxy for growth opportunities, while *Risk* is measured as the beta of the firm’s monthly stock returns over the preceding three years. While performance-related compensation is itself calculated as a function of total compensation, this allows for total compensation that is adjusted for the amount of risk borne by the executive (Conyon et al., 2011). We model the first stage of residual pay analysis as follows:

$$\begin{aligned}
 \text{LogTotalPay}_{jit} = & \alpha_0 + \alpha_1 \text{LogTimeInBoard}_{jit} + \alpha_2 \%Perform_{jit} + \alpha_3 \text{FirmSize}_{it} + \\
 & + \alpha_4 \text{ROA}_{it} + \alpha_5 \text{RETURN}_{it} + \alpha_6 \text{Leverage}_{it} + \alpha_7 \text{Risk}_{it} + \alpha_8 \text{BookToMarket}_{it} \\
 & + \text{YearDummies} + \text{IndustryDummies}_{it} + \text{AgeGroupDummies}_{jit} + \varepsilon_{jit}
 \end{aligned}
 \tag{1A}$$

We estimate this model separately on our samples of CEOs only, non-CEO executives, and a pooled sample of all executives. The regression model for all executive includes an extra

indicator variable, *CEO*, identifying the CEO. Industry dummies are based on 2-digit groupings from FTSE's Industrial Classification Benchmark (ICB) system.

Following Core et al. (2008), we use regression residuals from Equation 1A to construct two measures of residual compensation. Equation 1B.1 measures the deviation of *LogTotalPay* from the predicted value of Equation 1A (*PredictedLogTotalPay*), while Equation 1B.2 measures *ResidTotalPay* as the difference between *TotalPay* and the *PredictedTotalPay*, scaled by salary. *PredictedTotalPay* is calculated as the exponentiation of *PredictedLogTotalPay*:

$$ResidLogTotalPay_{jit} = LogTotalPay_{jit} - PredictedLogTotalPay_{jit} \quad (1B.1)$$

$$ResidTotalPay_{jit} = TotalPay_{jit} - PredictedTotalPay_{jit} \quad (1B.2)$$

We next examine whether these measures of residual compensation are associated with absolute or scaled measures of total pension increments using the following model:

$$\begin{aligned} (PENSION)_{jit} = & \alpha_0 + \alpha_1 Resid(PAY)_{jit} + \alpha_2 LogSalary_{jit} + \alpha_3 LogTimeinCompany_{jit} \\ & + \alpha_4 CEO_{jit} + \sum \alpha_5 (Firm\ Characteristics)_{it} + AgeGroupDummies_{jit} + \varepsilon_{jit} \end{aligned} \quad (1C)$$

where *(PENSION)* is either *LogTotalPension* or *Pension/Salary Ratio*, and *Resid(PAY)* is either *ResidLogTotalPay* or *ResidTotalPay/Salary*, respectively. *LogTotalPension* is the sum of all forms of pension benefits granted to or earned by the executive during the year. Our measure of *TotalPension* reflects the total retirement-related compensation granted to or earned by the executive during the year, and is calculated as the sum of three key executive pension compensation components; (i) change in actuarial present value of an executive's defined benefit pension plan during the year; (ii) defined contribution pensions; and (iii) salary supplements in lieu of pensions.<sup>12</sup>

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<sup>12</sup> Though one may argue that the change in the actuarial transfer value may represent a change in the accrued pension liability to the firm rather than compensation payout to the executive, we note that the transfer value

*Pension/Salary Ratio* is calculated as the executive's total pension award for the year scaled by salary. We scale the measures by salary to control for the mechanical positive relationship between pension and salary. When we model residual compensation and pensions in unscaled terms, we control for this directly by incorporating *LogSalary* into the model. (We note that *LogSalary* is not included in the model using *Pension/Salary Ratio* as the dependent variable.) *Firm Characteristics* is the vector of firm-specific variables included in Model 1A.

Sundaram and Yermack (2007) find that executive pension values are highly sensitive to age. The actuarial present value of future pension income grows larger as the executive grows older and approaches retirement. We examine age using age group dummies, since pension increments are likely to be non-linear in age. Along with an individual executive's age, we expect that executive pensions are highly sensitive to the years of service in the company. We use the log of the executive's years of service in company (*LogTimeInCompany*) as a measure of tenure, as years of service should directly affect defined benefit pension values.

**Levels of executive pensions and performance-based bonuses.** Our second test examines whether there is an association between pension increments, bonuses, and equity compensation in the total compensation package. We scale pension, bonus, and equity by salary to standardize measures as a ratio. We estimate the following model:

$$\begin{aligned}
 \text{Pension/Salary Ratio}_{jit} = & \beta_0 + \beta_1 \text{Bonus / Salary _ Ratio}_{jit} + \beta_2 \text{Equity / Salary _ Ratio}_{jit} \\
 & + \beta_3 \text{LogTimeInCompany}_{jit} + \beta_4 \text{CEO}_{jit} + \sum \beta_5 ( \text{FirmCharacteristics} )_{it} \\
 & + \text{AgeGroupDummies}_{jit} + \text{YearDummies} + \varepsilon_{jit}
 \end{aligned}
 \tag{2}$$

The independent variables of interest are the *Bonus/Salary Ratio* and *Equity/Salary Ratio*, which are calculated by dividing bonus and equity grants by salary, respectively. Consistent with

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represents the amount that may be transferred to another pension plan, including defined contribution plans. See HSBC Holdings plc (2006 Annual Report) for an example of the transfer out of CEO Michael Geoghegan's defined benefit pension entitlements into a separate defined contribution plan.

prior literature (Sundaram and Yermack, 2007; Gerakos, 2010; Kabir and Minhat, 2009), we control for a number of director and firm characteristics that we expect to affect levels of pension compensation, in particular the executive's years of service in the firm.

For Models 1C and 2 we include specifications both with and without the vector of additional firm level control variables. We include *ROA* (operating profit divided by the average of beginning and end of year total assets), and *RETURN* as measures of firm performance. As larger firms may offer a more generous pension payout, we control for the size of the firm (*FirmSize*). We also include the firm *Leverage* as a control variable, measured as the ratio of long-term debt to total assets. Kalyta and Magnan (2008) argue that firms with higher leverage are less likely to honor future obligations, including obligations related to pensions, which makes pensions less appealing to CEOs. This implies that CEOs in highly levered firms have less incentive to accept large pensions as a form of compensation, and may therefore receive lower pension awards. By contrast, Sundaram and Yermack (2007) argue that a positive association between leverage and pensions exists because debt-based compensation reduces the agency costs of debt. We therefore do not offer a directional prediction about the sign of this variable. We also include book-to-market ratio (*BookToMarket*), the ratio of book value to market value of assets, as it reflects organizational complexity and the inverse of the firm's growth opportunities, and firm risk (*Risk*).

**Governance Characteristics and Pensions.** It is possible that any systematic cross-sectional variation between pensions and other elements of total visible compensation simply represents a net result of an "equilibrium" level of total compensation across firms. Our third analysis therefore examines the role of firm governance plays in executive pension arrangements. We re-estimate the scaled version of Model 1C (including *ResidTotalPay/Salary*

to control for substitution effects), including a number of corporate governance variables, to examine whether weaker governance may be associated with executives receiving higher pensions and less performance-sensitive compensation.

Our measures of governance centre around the monitoring role of non-executive directors on the board. We examine the role of board size and structure, non-executive director ownership, and the busyness of remuneration committee members.

We construct a measure of total non-executive director ownership in the firm, *%NonExecOwnership*, which reflects the percentage of shares of the firm owned by its non-executive directors. We expect that the overall ownership is low, since our sample consists of large diversified firms, and in practice non-executive directors are rarely granted shares as part of their compensation package. We associate non-executive ownership with greater monitoring (Jensen and Meckling, 1976; Cyert et al., 2002), and therefore would predict lower pension awards to executives with increasing non-executive ownership in the firm.

We also include the percentage of the board composed of non-executive directors, *%BoardNonExecs*. Prior research indicates that board (and CEO) monitoring increases with the fraction of outside board members (Weisbach, 1988; Dahya and McConnell, 2005), and in this case may have a constraining effect on pension use. We expect a higher proportion of non-executive directors to be associated with greater monitoring, and therefore expect lower pension awards with a higher proportion of non-executive directors on board.

We include the size of the board, *Board Size*, to control for board effectiveness as prior research find greater board size reduce the potential for an effective board. We also refine the measure used by Fich and Shivdasani (2006) on busy directors to capture the proportion of remuneration committee members who are considered busy, *%RemcoBusy*. Remuneration

Committee members are classified as busy if they have 3 or more board positions. Busy remuneration committee members may devote less attention to their monitoring role, and permit a greater shift of the compensation package towards less-sensitive and more overlooked elements such as the pension. Prior research also examines CEO/Chairman duality and the likelihood of a combined CEO/Chairman to reduce the potential for an effective board (Core et al., 1999). UK corporate governance guidelines, however, caution against CEO and Chairman duality, and as a result this occurs very rarely in practice. There are no cases of CEO/Chairman duality in our sample, and therefore we cannot include this in our model. Similarly, we also construct a measure of the proportion of “Independent” non-executives, as classified by the firm, but because the vast majority of non-executives were classified as independent, we did not use this measure.

**Changes in executive pensions and performance-based bonuses.** Our fourth analysis focuses on the dynamic relation between changes in performance-insensitive total pension values, and changes in performance-based compensation from time  $t-1$  to  $t$ . If pensions are substitutive with performance-sensitive elements of compensation, we may observe contemporaneous substitution of pensions in cases of declining bonuses or equity in a dynamic setting. Under hypothesis  $H_3$ , the CEO and other executives are able to exert influence over other members of the board to obtain an increase in their pension in order to offset decreases in other elements of compensation, namely bonus or equity, which are more publicly visible and performance-sensitive. In order to separately identify decreases in bonuses, we construct a dynamic change model taking the following general form:

$$\begin{aligned}
\Delta Pension/Salary Ratio_{jit} = & \delta_0 + \delta_1 \Delta Bonus / Salary\_Ratio_{jit} + \delta_2 BonusSalaryDecreaseDV_{jit} \\
& + \delta_3 \Delta Bonus / Salary\_Ratio_{jit} * BonusSalaryDecreaseDV_{jit} \\
& + \delta_4 \Delta Equity / Salary\_Ratio_{jit} + \delta_5 EquityDecreaseDV_{jit} \\
& + \delta_6 \Delta Equity / Salary\_Ratio_{jit} * EquityDecreaseDV_{jit} \\
& + \delta_7 LogTimeInCompany_{jit} + \delta_8 CEO_{jit} \\
& + \sum \delta_9 ( \Delta FirmCharacteristics )_{it} + AgeGroupDummies_{jit} + \varepsilon_{jit}
\end{aligned}
\tag{3}$$

where the dependent variable is the change in the pension to salary ratio for the  $j^{\text{th}}$  executive from time  $t-1$  to time  $t$  ( $\Delta$  is the change operator),  $\Delta Pension/Salary Ratio$ .  $\Delta Bonus/Salary Ratio$  denotes the change in  $Bonus/Salary Ratio$  for the  $j^{\text{th}}$  executive from time  $t-1$  to time  $t$ . The  $BonusSalaryDecreaseDV$  is a dummy variable coded 1 to denote a decrease in the bonus and salary of  $j^{\text{th}}$  executive from time  $t-1$  to time  $t$ , and 0 otherwise. To examine the effect of changes in equity-based compensation on changes in pension, we also incorporate  $\Delta Equity/Salary Ratio$  into the model.  $EquityDecreaseDV$  is a dummy variable coded to 1 if there is a decrease in the executive's equity compensation.  $\Delta Bonus/Salary Ratio * BonusSalaryDecreaseDV$  and  $\Delta Equity/Salary Ratio * EquityDecreaseDV$  are included as interaction terms.  $\Delta FirmCharacteristics$  is the vector of firm-level variables as above in their first differenced terms, except for  $BookToMarket$ , which we leave un-differenced due to its correlation with  $RETURN$ .

If pensions are considered only as long-term deferred compensation, and primarily a function of age and tenure, then no systematic relationship should be observed between changes in pension and bonus elements of the compensation in the model. Our model specification with an indicator for decreases in bonuses and an interaction term capturing the magnitude of the decrease allows us to test whether there is an association between change in pensions and decreases in bonuses, while controlling for other factors posited by prior literature to affect pensions. The coefficient corresponding to the change in bonus from time  $t-1$  to time  $t$  is  $\delta_1$ . The

additional intercept and slope difference for decreases in bonuses are represented respectively by  $\delta_2$  and  $\delta_3$  (the coefficient on interaction term). The total coefficient for a director with a decrease in *Bonus/Salary Ratio* is therefore  $\delta_1 + \delta_3$ .

We focus on whether  $\delta_2$  is positive and  $\delta_3$  is significantly negative. A positive  $\delta_2$  coefficient to *BonusSalaryDecreaseDV* would suggest that executives with decreases in their cash compensation during the year receive additional pension compensation. A significantly negative  $\delta_3$  coefficient would indicate that executives with decreases in their bonus from time  $t-1$  to time  $t$  are compensated with additional pension increments during the same period. A positive  $\delta_2$  and negative interaction term  $\delta_3$  would support hypothesis  $H_3$  that pensions are “stealth” compensation which can be used to “compensate” for contemporaneous declines in other elements of compensation. We also adopt the same methodology to examine the effects of decreases in equity compensation.

### **Sample and Data**

Our sample is composed of executives of UK firms that were members of the FTSE 100 index any time over a five year period between 2004 and 2008,<sup>13</sup> excluding firms classified as investment trusts and real estate trusts. We manually collect a number of data items for each executive from firms’ annual reports. These include: (i) beginning and end-of-year actuarial present value of future defined benefit pensions (transfer value or pension wealth)<sup>14</sup>; (ii) annual pension increments, the actuarially adjusted difference between the actuarial present value of pension in year  $t$  and the present value of pension in year  $t-1$ ; (iii) the value of contributions

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<sup>13</sup> In order to maximize the sample and to reduce index-survivorship bias we use all available observations from firms that join the FTSE 100 index during 2004-2008 period and firms that drop out of the FTSE 100 index but remain listed, and those that drop out and rejoin the index.

<sup>14</sup> The actuarial present value of future defined pension benefits is calculated based on the individual’s number of years of service and average or final salary at retirement, using the prevailing benefit formula, along with actuarial assumptions about life expectancy and market interest rates. These are calculated in accordance with the Actuarial Guidance Note GN11 (“Retirement Benefit Schemes – Transfer Values”), published by the UK Institute of Actuaries and the Faculty of Actuaries.

made by the firm to an executive's defined contribution pension; (iv) the total cash salary supplement made by a firm to an executive, either to make his own pension arrangements; to supplement a defined benefit or defined contribution pension benefit which has already reached the HMRC tax limit; or to cover additional taxes arising from pension benefits above the HMRC tax limit, and (v) the arrangement for each individual executive.

Data on other elements of executive compensation, age, tenure, ownership, and board characteristics are obtained from BoardEx; and accounting and market data from Datastream. FTSE index membership and industry classification are obtained directly from FTSE. After excluding executives without a full year of service, departing executives and observations with missing pension, firm or Datastream data, our sample consists of 415 firm-years and 1,556 executive director-years.

Table 1, Panel A, identifies the type of pension plan provided for all executives in our sample. These include three key types of pension provisions and combinations of these types: (i) defined benefit pension; (ii) defined contribution pension; (iii) salary supplement; and those executives with no pension-related compensation. We observe that there is considerable heterogeneity in UK executive pension arrangements, and also that in some firms, different executives have very different pension arrangements. We also note that defined benefit pension plans are still the dominant form of pension for executives in FTSE 100 companies. Approximately 65% of sample FTSE 100 executives have a defined benefit pension as part of their compensation package, confirming that widespread use of defined benefit pensions in the UK. However, pension plans for executives show a gradual move away from defined benefit-only plans, following the change in the UK's pension taxation regime in April 2006. We see a

gradual increase in firms using a defined benefit pension combined with a cash salary supplement, or salary supplement only.

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INSERT TABLE 1 HERE  
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Table 2 presents descriptive statistics of firm-level and executive-level characteristics for our final sample of firms (Panels A and B), and CEO-only characteristics (Panel C). It is observed that sample firms have median total assets of approximately £6.1 billion. Both median accounting (9%) and market returns (14%) are positive over the sample period. The median book to market ratio is 0.23, and the median firm has a long-term debt to total assets ratio of 18%.

Panel B provides detailed breakdown of data on elements of total executive compensation (including pensions) for all CEO and non-CEO executives in our sample. The mean total pay package received by sample FTSE 100 executives, excluding pensions, is £2.1 million, composed of approximately 21% salary, 19% bonus, and 56% equity-based pay (stock options and restricted shares). Pensions add on average another 17% to this total. Panel C provides the same detailed breakdown of compensation for the CEOs only. The mean total pay package received by a sample CEO is £3.4 million excluding pension, substantially higher than average sample executives, but has a comparable composition to all executives. Panels B and C suggest that pension benefits comprise a significant fraction of executive compensation, and that studies that omit executive pensions are potentially under-representing the total compensation package. This is comparable to mean annual pension as a percentage of pay found in prior US and UK studies (Sundaram and Yermack, 2007; Gerakos, 2010; Kabir and Minhat, 2009). Total annual direct pension compensation or change in pension wealth averaged £352,000 for all executives and £518,000 for CEOs, with the highest values coming from defined benefit pensions.

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## RESULTS

### **Pensions and Residual Compensation**

We first model total compensation, excluding pensions, on a vector of economic determinants. Specifically, we regress *LogTotalPay*, excluding pensions, on executive level variables such as whether the manager is a CEO, the percentage of executive's annual compensation package that is performance-related, executive tenure and age, and on firm-level variables such as firm size, accounting returns, stock returns, leverage, growth opportunities and firm risk. Year and industry fixed effects are also included in the model to capture market-wide and industry-specific trends affecting total pay levels.

The results in Table 3 show a strong elasticity between total compensation and *FirmSize*, tenure (measured by *LogTimeInBoard*), and a premium for being the *CEO*. We note that the coefficient to *FirmSize* is lower than in previous studies (see Murphy (1999), who notes 0.30 as a standard elasticity). However, this may be due to our sample being composed of larger firms, which may have smaller average assets-pay elasticity, or a level of non-firm-specific compensation, which is captured by the constant and industry dummy variables. There is also a positive relationship with performance (as measured by *ROA*) for CEOs only. Lower-growth firms have lower total compensation (a negative coefficient on *BookToMarket*), consistent with prior research.

We observe a negative relationship between leverage and total compensation, consistent with Mehran (1995), who finds a negative (but non-significant) coefficient on leverage when considering equity-based compensation. We also find a negative but not significant relationship

between total compensation and *Risk*; this may be due to the fact that our sample consists of large firms in the FTSE 100, which are relatively mature and stable, or it suggests that risk is already accounted for in *%Perform*, which is highly positively related to total compensation. Overall, our model explains a large proportion of the variation in total pay, with an adjusted  $R^2$  of 77% for the full sample of all executives.

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Table 4 presents the results for our analysis of the residual compensation estimated from Table 3, measured as the difference between actual and predicted log total compensation (Equation 1B.1). Panel A, Columns 1–3 show a negative and significant relationship between residual compensation and *LogTotalPension* after controlling for executive age, tenure, and the relationship between pension and salary. This suggests that pensions are substitutive to other elements of compensation, where executives that earn less than predicted receive a higher pension, while executives that earn more than predicted receive a lower pension. The elasticity of residual compensation to pensions for the CEO is approximately  $-0.96$ , which is supportive of hypothesis  $H_{1A}$ . Panel A, Columns 4–6 present regression estimates with additional controls at firm level. Again we find a significantly negative coefficient to residual compensation of approximately  $-1.00$  for CEOs.

Panel B shows that the scaled residual compensation, *ResidTotalPay/Salary Ratio*, is also significantly negatively related to the *Pension/Salary Ratio*, supporting the notion that executives with lower residual pay receive a higher pension. This suggests that the pension, even after scaling by salary, plays a significant substitutive role relative for other elements of compensation.

Overall, we observe a consistently negative and significant relationship between pension and residual pay for both CEOs and the full sample, supporting hypothesis  $H_{IA}$ . This finding suggests that pensions, measured in absolute and scaled terms, are significantly and negatively associated with residual compensation, and may represent one way by which firms can employ to reduce the size of publicly visible compensation. When including firm-level characteristics, *Risk* has a significant and negative association with the executive's pension increments for both CEOs and the full sample, and *ROA* has a positive association. This suggests that risky firms are likely to offer less long-term pension compensation to executives, and more profitable firms are likely to make more generous executive pension awards. Among executive-level variables, the individual executive's tenure (*LogTimeInCompany*), salary and age all exhibit positive association with the pension values, as expected.

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### **Cross-sectional Pension-Bonus Substitution**

To test hypotheses  $H_{IB}$  and  $H_{IC}$ , we model the pension-bonus and pension-equity relationships on a cross-sectional basis. Table 5 reports results from estimating our level specification in Model 2, which regresses pensions over bonuses and equity. We use the scaled measure of total pension (*Pension/Salary Ratio*), bonus (*Bonus/Salary Ratio*), and equity (*Equity/Salary Ratio*) in order to control for higher absolute pension, bonus, and equity which are due to higher base salary. We also include our variable for years of service, *LogTimeInCompany*. Table 5, Columns 1–3, reports the regression results for our samples of CEOs only, non-CEO executives, and the pooled sample, respectively. The coefficient on the key explanatory variable, *Bonus/Salary Ratio*, is of the predicted negative sign and statistically significant at 5 percent. This suggests the

presence of a negative cross-sectional relationship between pensions and bonuses, and that there is a substitution effect between these two elements of the compensation package, supportive of hypothesis  $H_{1B}$ . The significantly negative coefficients between pension increments and bonuses are consistent across all three samples, after clustering standard errors by firm. We also find some weak evidence supportive of hypothesis  $H_{1C}$  on the substitution effect between pension and equity-based pay, primarily for non-CEO executives.

When we include a vector of control variables, we also find that *FirmSize* is a significantly positive predictor of annual total pension increments, consistent with findings in Sundaram and Yermack (2007). Since we examine the *Pension/Salary Ratio*, this suggests that larger firms pay proportionately larger pensions, even after controlling for variations in salary due to firm size. We also find a positive relationship for non-CEOs with *ROA*, and a negative relationship with *Risk*, as in Table 4, Panel B. We do not obtain significant estimates for stock returns, leverage, or growth opportunities, but most are of predicted signs. We also note that our cross-sectional results do not imply causality in the pension-bonus or pension-equity trade-off, or that executives seek higher pensions in exchange for lower bonuses or equity; it is possible that firms that award higher pensions are more conservative with granting bonuses or equity, and firms that grant high bonuses and equity are less likely to grant large pensions in their compensation package.

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### **Corporate Governance Characteristics and Executive Pension**

Table 6 presents results from our tests of hypothesis  $H_2$ . The regressions of scaled pension (*Pension/Salary Ratio*) on scaled residual compensation (*ResidTotalPay/Salary*), corporate

governance characteristics, and executive level controls (age and tenure) are presented in Columns 1–3. The results show that the proxy related to non-executive ownership (*%NonExeOwn*) is negative and significant at 1% for CEOs, indicating that greater monitoring associated with higher non-executive ownership plays a constraining role on the relative magnitude of CEO pensions. The size of the board (*BoardSize*) is significantly positive related to the magnitude of the pension, while the percentage of remuneration committee members that are busy (*%Remco Busy*) is positive and marginally significant for non-CEO executives.

Our evidence is weakly supportively of poorer governance, where less effective board monitoring leads to increase in non-CEO executive pension compensation. Contrary to conventional expectation, in which higher outside and greater monitoring would predict lower compensation, our proxy for board representation by non-executives (*%BoardNonExecs*) has a positive (but not significant) association with executive pensions. This unexpected positive coefficient contributes to the mixed empirical evidence on the monitoring role and value of non-executive directors.

Table 6, Columns 4–6 report results when we include a vector of control variables for firm characteristics as consistency checks. The evidence on non-executive ownership, and the proxies related to board monitoring quality and effectiveness (*BoardSize* and *%RemcoBusy*) are strengthened for both variables. It is worth noting that pooling CEOs with varying degrees of power across a sample of large diversified firms with a generally good governance environment, such as the FTSE 100 firms in our sample, could bias against our tests in finding more significant results related to our governance proxies. Taken together, the signs of the coefficients on board size and non-executive ownership are cautiously supportive of the hypothesis  $H_2$  that when governance is weak, executives are able to extract rents via greater pension compensation.

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INSERT TABLE 6 HERE  
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### **Dynamic Pension-Bonus Substitution**

Table 7 presents regression estimates from our dynamic model, which examines the change in the size of the pension and changes in other elements of compensation. In this set of tests, we include only executives that have been in their current position for at least two years, and therefore we lose observations compared to our earlier tests. In columns 1–3, we include only  $\Delta Bonus/Salary Ratio$ , with an indicator variable for decreases in bonus and salary from period to  $t-1$  to  $t$ ,  $BonusSalaryDecreaseDV$ , interacted with  $\Delta Bonus/Salary Ratio$ . In columns 4–6, we include variables for changes in equity-based compensation,  $\Delta Equity/Salary Ratio$ , an indicator variable for decreases in equity based compensation from period  $t$  to  $t-1$ , and an interaction term between the two.

Results in Table 7 show that for our sample of CEOs, there is a general positive relationship between changes in the  $Bonus/Salary Ratio$  and the  $Pension/Salary Ratio$ . The coefficient for the bonus and salary decrease dummy variable ( $BonusSalaryDecrDV$ ) is positive and significant at 5 percent. This indicates that pension awards are higher for executive with declines in their visible cash compensation over the corresponding period, namely salary and bonuses. We find consistent and strong support for our hypothesis  $H_3$  for the sample of CEOs and in the pooled sample, as indicated by significantly positive coefficients on our indicator ( $BonusSalaryDecrDV$ ) and negative coefficients to our interaction terms ( $\Delta Bonus/Salary Ratio * BonusSalaryDecrDV$ ). These results suggest that pensions can be used as a substitute for declines in bonuses, which are more prone to regulatory scrutiny and public outrage. In the same dynamic setting, we do not observe that that pensions function as a substitute for changes in

equity-based compensation, as evidenced by the non-significance of *EquityDecrDV* and  $\Delta Equity/Salary Ratio * EquityDecrDV$ .

Our results on the sample of non-executives are weaker, suggesting that the strong effect of CEOs adds significance to the pooled sample. They suggest that the substitution effect and compensating effect of pensions is stronger for CEOs, who may be able to extract additional rents compared to non-CEO executives. This further corroborates our earlier findings concerning governance effectiveness and CEO pensions.

The model is able to explain a modest proportion of the variation in  $\Delta Pension/Salary Ratio$  for CEOs with and without changes in equity-based pay as controls, with  $R^2$  of 11%. We note that for the pooled sample of executives, the coefficient on  $\Delta Bonus/Salary Ratio$  (including both negative and positive changes) is positive and marginally significant at 5%. This suggests some upward movement in pensions, when bonuses are both increasing and decreasing. This may be indicative of a general upward trend in pensions, which is attributable to the additional year of service in a dynamic setting.

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INSERT TABLE 7 HERE  
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### **The Effect of Taxes**

Although the managerial power hypothesis may yield competing empirical predictions from the optimal contracting theory on the role of pensions within total executive compensation package; these two are not mutually exclusive. The managerial power view does not suggest that all compensation schemes serve only the executive's interests; rather it argues that rent extraction plays a role in compensation arrangements and that, as a result, managers are paid more than is optimal and are paid in ways that may not necessarily optimal for shareholders. Findings from our cross-sectional tests suggest that executive pensions are substitutive to other elements of

compensation, where deficiencies in expected total compensation are substituted by higher pensions, and vice versa. However, it is difficult to empirically test whether the total expected compensation including pensions is consistent with optimal contracting, or whether pensions constitute part of an optimal pay package (Sundaram and Yermack, 2007). One may argue that it is possible that such cross-sectional substitution effects are tied to unexamined or unobservable changes in executive characteristics, measures of their performance and/or incentive structure set out by the remuneration committee.

One important incentive factor to consider in executive pension compensation-setting process is taxation, since approved pension benefits are subject to statutory tax limits, which may affect the net benefits to executives. The UK's HMRC limits the amount of "earned" retirement benefit that is tax deductible annually (£215,000 for 2006/07) and for an individual's lifetime (£1.6 million for 2006/07). These amounts are updated annually by the UK HMRC, but we have used reported limits from our sample period.

As a robustness check to our primary findings, we construct an indicator variable, *OverLifeLimit*, which reflect executives whose total pension value exceeds the HMRC Lifetime Allowance, which is the maximum retirement benefit without being subject to additional taxes. We expect that already being over the lifetime deductible pension limit will have a negative effect on current pension awards. Our sensitivity test thus examines the association between pensions and our proxy for executive personal tax limit, allowing for substitution under equilibrium compensation under specifications of Models 1C and 2. Our untabulated results find that the coefficient on *OverLifeLimit* is significantly negatively related to size of the pension in Models 1C and 2, which correspond to results presented in Table 4, 5 and Table 6.

Even after controlling for the personal tax status of executives, our main evidence concerning the negative association between pensions, residual compensation and corporate governance characteristics remain qualitatively unchanged. This significantly negative coefficient of tax variable (*OverLifeLimit*) suggests that executives who are over the tax-exempt pension limit receive a lower pension than other executives.

## **DISCUSSION AND CONCLUSION**

In this study, we examine executive pensions as a form of compensation, its relationship with other elements of compensation, and its role in the overall executive compensation package. We contribute to the emerging literature on executive pensions, using a sample of CEOs and executives of large UK firms during the 2004–2008 period. While prior studies have used researcher-estimated actuarial data, we use disclosed and audited data, calculated according to uniform actuarial guidelines.

Pensions as an instrument of executive compensation has received little attention in prior theoretical and empirical research into executive compensation (Sundaram and Yermack, 2007; Jenter and Frydman, 2010). After modelling total compensation on economic and director-specific characteristics, we examine the relationship between residual compensation and pensions, finding a negative relationship. We next provide evidence of a cross-sectional substitution effect between pensions and performance-sensitive elements of compensation. We do not draw inferences about causality in our cross-sectional results, since it may well be a firm-level compensation-policy decision that determines the relative weights of bonuses and pensions in the compensation package. However, we provide some evidence to show that weaker monitoring (lower non-executive ownership, busy remuneration committee members) is

associated with higher pension compensation, suggesting the potential for the use of pensions to extract excess rents, consistent with Bebchuk and Fried (2004)'s managerial power hypothesis.

Our findings suggest that although UK compensation reporting regulations require detailed pension disclosures, the complexity, opacity and lack of standardization in reporting on pensions, combined with a lack of researcher and investor attention to pensions, can potentially lead to pensions being used to compensate for deficiencies in more visible elements of compensation. Indeed, on a time-series basis, we observe co-movements between declining bonuses and increasing pensions, suggesting that pensions can be used by firms as a means to offset bonus decreases in less-visible ways, consistent with a managerial power view towards compensation-setting. This evidence holds even after controlling for age and tenure-related increases in pensions and other firm and individual characteristics.

Our study is timely and contributes to literature on executive compensation by providing new evidence and understanding about the role of pensions in executive compensation. Our results suggest that there exists a substitution effect between pensions and more visible, performance sensitive elements of total compensation, and this appears to be stronger in settings of weaker governance. Our findings are therefore of interest to corporate governance researchers, and have important public policy implications, highlighting the need to standardize and enhance the quality of disclosures for this important element of executive compensation across different governance regimes.

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**Table 1: Breakdown of Pension Arrangements among All Executives**

<b>Type of Pension Arrangement(s)</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>Total</b>	<b>% of Total</b>
<i>Defined Benefit Only</i>	193 (53.3%)	166 (48.7%)	114 (38.1%)	92 (32.5%)	80 (29.5%)	645	41.5%
<i>Defined Contribution Only</i>	59 (16.3%)	57 (16.7%)	48 (16.1%)	65 (23.0%)	60 (22.1%)	289	18.6%
<i>Salary Supplement Only in lieu of pension</i>	7 (1.9%)	14 (4.1%)	19 (6.4%)	29 (10.3%)	35 (12.9%)	104	6.7%
<i>Defined Benefit + Defined Contribution</i>	39 (10.8%)	40 (11.7%)	21 (7.0%)	12 (4.2%)	16 (5.9%)	128	8.2%
<i>Defined Benefit + Salary Supplement</i>	26 (7.2%)	24 (7.0%)	47 (15.7%)	53 (18.7%)	51 (18.8%)	201	12.9%
<i>Defined Benefit + Defined Contribution+ Salary Supplement</i>	8 (2.2%)	10 (2.9%)	14 (4.7%)	3 (1.1%)	1 (0.4%)	36	2.3%
<i>Defined Contribution + Salary Supplement</i>	15 (4.1%)	18 (5.3%)	25 (8.4%)	15 (5.3%)	10 (3.7%)	83	5.3%
<i>No Pension Provision</i>	15 (4.1%)	12 (3.5%)	11 (3.7%)	14 (5.0%)	18 (6.6%)	70	4.5%
<i>Total executives</i>	362	341	299	283	271	1,556	100.0%

*Notes to Table 1:*

Table 1 identifies the type of pension plan(s) provided for all executives (both CEOs and non-CEOs) in the sample.

**Table 2: Descriptive Statistics**

<b>Panel A: Firm-level Characteristics</b>								
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>S.D.</b>
<i>Average Assets (£m)</i>	415	19,973	94	2,625	6,080	13,038	327,524	45,888
<i>Leverage</i>	415	0.21	0.00	0.09	0.18	0.32	0.64	0.16
<i>ROA</i>	415	0.10	-0.01	0.05	0.09	0.13	0.35	0.07
<i>RETURN</i>	415	0.11	-0.72	-0.08	0.14	0.31	0.89	0.33
<i>Risk</i>	415	1.02	-0.12	0.52	0.89	1.36	3.40	0.69
<i>BookToMarket</i>	415	0.36	0.00	0.11	0.23	0.46	2.09	0.40

*Notes to Table 2, Panel A:*

This table reports descriptive statistics for key regression variables. *Average Total Assets* is the average of opening and closing total assets (note that in the regression models we estimate *Firm Size* as the Log of *Average Assets*), *Leverage* is ratio of debt to total assets; *ROA* is operating profit scaled by the average of total assets at the beginning and the end of the year; *RETURN* is total returns to shareholders during the year, reflecting share price appreciation and dividend yield; *BookToMarket* is the ratio of the book value of equity to market value of equity; *Risk* is the beta of the firm's monthly returns over the past three years, as calculated by Datastream. All variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

<b>Panel B : Executive-level Characteristics</b>								
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>S.D.</b>
<i>Salary</i>	1,556	456	94	312	413	559	1,095	205
<i>Bonus</i>	1,556	395	0	130	262	512	2,870	451
<i>Equity</i>	1,556	1,200	0	319	701	1,378	10,896	1,663
<i>Other</i>	1,556	48	0	15	24	44	437	72
<i>Total Pay (excl Pension)</i>	1,556	2,133	218	891	1,474	2526	14,491	2,175
<i>Defined Benefit Pension</i>	1,003	465	0	78	295	659	2,524	508
<i>Defined Contribution</i>	536	86	0	23	58	106	382	87
<i>Salary Supplement</i>	424	113	0	51	97	166	284	76
<i>Total Pension</i>	1,556	352	0	72	190	434	2,229	437
<i>Age</i>	1,556	50.9	32	46	51	56	76	6.5
<i>Time In Board</i>	1,556	6.6	0.0	2.6	4.9	8.8	51.5	5.9
<i>Time In Company</i>	1,556	11.4	1.0	4.0	8.3	17.9	56.1	9.2
<i>%Perform</i>	1,556	0.65	0.00	0.56	0.70	0.78	0.99	0.20
<i>Bonus/Salary Ratio</i>	1,556	0.93	0.00	0.40	0.65	1.00	9.00	1.27
<i>Pension/Salary Ratio</i>	1,556	0.74	0.00	0.21	0.40	1.06	4.15	0.81

**Table 2: Descriptive Statistics (cont'd)**

<b>Panel C: CEO Only Characteristics</b>								
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>S.D.</b>
<i>Salary</i>	415	658	94	500	660	802	1095	216
<i>Bonus</i>	415	612	0	236	467	784	2870	593
<i>Equity</i>	415	1,989	0	540	1,267	2,359	10,896	2,358
<i>Other</i>	415	65	0	20	33	71	437	84
<i>Total Pay (excl Pension)</i>	415	3,388	218	1,470	2,465	4,151	14,491	3,015
<i>Defined Benefit Pension</i>	243	698	0	58	555	1,178	2,524	701
<i>Defined Contribution</i>	155	138	0	27	98	225	225	125
<i>Salary Supplement</i>	142	169	12	108	175	230	284	76.2
<i>Total Pension</i>	415	518	0	130	272	744	2,229	580
<i>Age</i>	415	52.1	32	48	52	56	73	6.1
<i>Time In Board</i>	415	8.3	0.9	3.7	6.9	11.7	48.4	6.2
<i>Time In Company</i>	415	11.4	1.0	4.0	8.4	17.9	53.0	9.1
<i>%Perform</i>	415	0.67	0.00	0.58	0.71	0.80	0.99	0.21
<i>Bonus/Salary Ratio</i>	415	1.03	0.00	0.45	0.72	1.03	9.00	1.46
<i>Pension/Salary Ratio</i>	415	0.76	0.00	0.25	0.39	1.12	4.15	0.83

*Notes to Table 2, Panels B and C: Monetary values in thousands*

Panels B and C presents descriptive statistics for all executive directors (both CEOs and non-CEOs), and Panel C presents descriptive statistics for CEOs only. *TotalPay* is the sum of the director's salary, bonus, other benefits and *Equity* received during the year. Pension Components (*Defined Benefit Pension*, *Defined Contribution*, and *Salary Supplement*) are presented for only executives who are granted those pension components, however *Total Pension* is the sum of all three components for all executives. *Equity* is the value of short- and long-term incentive plans and stock options. Stock option grants are measured at grant date using the Black-Scholes model and incentive plans are valued at full value using closing market price at the end of the year of the grant (the date of annual report). *%Perform* is the percentage of the executive's annual compensation package that is performance-related. *Time In Board* is the number of years that the executive has been a member of the board, while *Time Before Board* is the number of years that the executive was employed by the company before joining the board. The *Bonus/Salary Ratio* is calculated using dividing *Bonus* by *Salary*, and the *Pension/Salary Ratio* is calculated using the executive's *Total Pension* increase divided by *Salary*. All variables except *Age*, *Time In Board* and *Time In Company* are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

**Table 3: Determinants of Total Compensation (excluding Pensions)**

	(1) CEOs Only	(2) Non-CEO Executives	(3) All Executives
Variables	<i>LogTotalPay</i>	<i>LogTotalPay</i>	<i>LogTotalPay</i>
<i>LogTimeInBoard</i>	-0.04 (-0.70)	0.20 <sup>***</sup> (6.40)	0.15 <sup>***</sup> (5.01)
<i>CEO</i>			0.56 <sup>***</sup> (19.96)
<i>%Perform</i>	2.71 <sup>***</sup> (13.91)	2.55 <sup>***</sup> (14.39)	2.62 <sup>***</sup> (16.19)
<i>FirmSize</i>	0.22 <sup>***</sup> (6.05)	0.16 <sup>***</sup> (4.33)	0.17 <sup>***</sup> (4.89)
<i>ROA</i>	1.28 <sup>*</sup> (2.04)	0.18 (0.30)	0.47 (0.82)
<i>RETURN</i>	-0.03 (-0.41)	0.07 (0.81)	0.03 (0.47)
<i>Leverage</i>	-0.74 <sup>†</sup> (-1.97)	-0.56 <sup>*</sup> (-2.20)	-0.60 <sup>*</sup> (-2.23)
<i>Risk</i>	-0.05 (-0.68)	-0.04 (-0.71)	-0.04 (-0.68)
<i>BookToMarket</i>	-0.07 (-0.63)	-0.04 (-0.41)	-0.04 (-0.53)
<i>Constant</i>	2.66 <sup>***</sup> (4.11)	2.67 <sup>***</sup> (4.10)	2.46 <sup>***</sup> (3.85)
<i>Industry Controls</i>	Yes	Yes	Yes
<i>Age Group Dummies</i>	Yes	Yes	Yes
<i>Year Dummies</i>	Yes	Yes	Yes
<i>Observations</i>	415	1,141	1,556
<i>R-squared</i>	0.82	0.73	0.78
<i>Adj. R-squared</i>	0.81	0.72	0.77

*Notes to Table 3:*

This table shows the coefficients and t-statistics (in parentheses) from estimating OLS regressions examining determinants of total compensation (excluding pension) for CEOs (Column 1), Non-CEO executives (Column 2), and all executives (Column 3). Residuals estimated from the 1<sup>st</sup> stage regressions are used in Table 4 to assess the relationship between pensions and residual compensation. The White t-statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year.

<sup>\*\*\*</sup> p < .001

<sup>\*\*</sup> p < .01

<sup>\*</sup> p < .05

<sup>†</sup> < .10.

**Table 4: Determinants of Total Pension**

**Panel A: Pension and Residual Total Compensation (excluding pension)**

	(1)	(2)	(3)	(4)	(5)	(6)
	CEOs Only	Non-CEO Executives	All Executives	CEOs Only	Non-CEO Executives	All Executives
Variables	<i>LogTotal Pension</i>					
<i>ResidLogTotalPay</i>	-0.96** (-2.74)	-0.55** (-2.86)	-0.58** (-3.11)	-1.00** (-2.75)	-0.38† (-1.79)	-0.46* (-2.24)
<i>LogSalary</i>	2.27*** (8.32)	1.69*** (8.32)	1.85*** (8.72)	2.38*** (7.21)	1.38*** (5.61)	1.61*** (6.52)
<i>LogTimeInCompany</i>	0.04 (0.31)	0.26** (3.18)	0.19* (2.44)	0.07 (0.62)	0.27*** (3.44)	0.20** (2.79)
<i>CEO</i>			-0.56*** (-3.39)			-0.40* (-2.43)
<i>FirmSize</i>				-0.10 (-1.00)	0.16** (2.64)	0.10 (1.59)
<i>ROA</i>				-2.59 (-0.96)	-0.04 (-0.03)	-0.95 (-0.71)
<i>RETURN</i>				-0.11 (-0.29)	0.01 (0.05)	-0.06 (-0.28)
<i>Leverage</i>				0.26 (0.24)	0.90 (1.46)	0.80 (1.29)
<i>Risk</i>				-0.41* (-2.58)	-0.39** (-3.29)	-0.42*** (-3.72)
<i>BookToMarket</i>				0.31 (0.77)	0.07 (0.26)	0.10 (0.39)
<i>Constant</i>	-10.97*** (-6.18)	-6.19*** (-5.34)	-7.18*** (-5.89)	-9.34*** (-4.54)	-6.69*** (-4.98)	-7.05*** (-5.20)
<i>Age Group Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	415	1,141	1,556	415	1,141	1,556
<i>R-squared</i>	0.36	0.35	0.34	0.40	0.39	0.37
<i>Adj. R-squared</i>	0.34	0.34	0.33	0.37	0.38	0.36

*Notes to Table 4, Panel A:*

This table reports coefficient estimates and t-statistics (in parentheses) for OLS models examining the relationship between total pension benefits and residual compensation. *LogTotalPension* is calculated as the sum of the change in the transfer value of the defined benefit pension plan, defined contribution benefits, and cash received in lieu of pension benefits. In Columns 1–3 we measure the relationship of between the pension, salary, and residual compensation from Table 3, with *ResidLogTotalPay* for CEOs calculated from Table 3, Column 1, Non-CEOs from Table 3, Column 2, and the full sample from Table 3, Column 3. Columns 4–6 includes a vector of control variables, and age group and year effects. The White-t statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year.

\*\*\* p < .001, \*\* p < .01, \* p < .05, † < .10.

**Table 4: Determinants of Total Pension (cont'd)**

<b>Panel B: Pension–Salary Ratio and Scaled Residual Compensation (excluding Pension)</b>						
	(1)	(2)	(3)	(4)	(5)	(6)
	CEOs Only	Non-CEO Executives	All Executives	CEOs Only	Non-CEO Executives	All Executives
<b>Variables</b>	<i>Pension/ Salary Ratio</i>	<i>Pension/ Salary Ratio</i>	<i>Pension/ Salary Ratio</i>	<i>Pension/ Salary Ratio</i>	<i>Pension/ Salary Ratio</i>	<i>Pension/ Salary Ratio</i>
<i>ResidTotalPay/Salary</i>	−0.03 <sup>†</sup> (−1.82)	−0.02 <sup>**</sup> (−2.96)	−0.02 <sup>**</sup> (−2.92)	−0.03 <sup>*</sup> (−2.11)	−0.01 (−1.45)	−0.01 <sup>†</sup> (−1.75)
<i>LogTimeInCompany</i>	0.24 <sup>***</sup> (4.09)	0.25 <sup>***</sup> (6.11)	0.25 <sup>***</sup> (6.23)	0.24 <sup>***</sup> (3.97)	0.24 <sup>***</sup> (5.89)	0.24 <sup>***</sup> (6.05)
<i>CEO</i>				0.11 <sup>*</sup> (2.22)	0.13 <sup>***</sup> (5.10)	0.12 <sup>***</sup> (4.25)
<i>FirmSize</i>			−0.05 (−1.07)			−0.04 (−0.85)
<i>ROA</i>				0.41 (0.59)	1.08 <sup>**</sup> (2.74)	0.85 <sup>*</sup> (2.11)
<i>RETURN</i>				0.17 (1.06)	0.09 (0.69)	0.10 (0.84)
<i>Leverage</i>				0.36 (0.81)	0.43 (1.51)	0.41 (1.38)
<i>Risk</i>				−0.15 <sup>*</sup> (−2.17)	−0.11 <sup>*</sup> (−2.57)	−0.12 <sup>**</sup> (−2.82)
<i>BookToMarket</i>				−0.04 (−0.27)	−0.00 (−0.02)	−0.02 (−0.18)
<i>Constant</i>	−0.20 (−1.12)	−0.11 (−0.99)	−0.11 (−1.11)	−1.67 <sup>*</sup> (−2.30)	−2.13 <sup>***</sup> (−5.41)	−1.97 <sup>***</sup> (−4.50)
<i>Age Group Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	415	1,141	1,556	415	1,141	1,556
<i>R-squared</i>	0.18	0.26	0.23	0.22	0.32	0.28
<i>Adj. R-squared</i>	0.15	0.26	0.23	0.19	0.31	0.27

*Notes to Table 4, Panel B:*

This table reports coefficient estimates and t-statistics (in parentheses) for our regression model estimating the relationship between *Pension/Salary Ratio* and the scaled residual, *ResidTotalPay/Salary*, calculated as *TotalPay* less the Estimated Total Pay (the exponentiated predicted *LogTotalPay*), scaled by salary, and other executive and firm characteristics. The White t-statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year.

\*\*\* p < .001

\*\* p < .01

\* p < .05

† < .10.

**Table 5: Cross-sectional Relation between scaled Pension and Other Elements of Compensation (Bonus and Equity)**

	(1)	(2)	(3)	(4)	(5)	(6)
	CEOs Only	Non-CEO Executives	All Executives	CEOs Only	Non-CEO Executives	All Executives
Variables	<i>Pension/Salary Ratio</i>					
<i>Bonus/Salary Ratio</i>	-0.06* (-2.21)	-0.05*** (-4.28)	-0.05*** (-4.23)	-0.05† (-1.94)	-0.05*** (-3.68)	-0.05*** (-3.83)
<i>Equity/Salary Ratio</i>	-0.01 (-0.63)	-0.02† (-1.98)	-0.02 (-1.59)	-0.02 (-1.39)	-0.02* (-2.25)	-0.02* (-2.49)
<i>LogTimeInCompany</i>	0.24*** (4.08)	0.25*** (6.30)	0.25*** (6.41)	0.23*** (3.96)	0.24*** (6.12)	0.24*** (6.30)
<i>CEO</i>			-0.03 (-0.66)			-0.02 (-0.37)
<i>FirmSize</i>				0.12* (2.45)	0.14*** (5.76)	0.13*** (4.80)
<i>ROA</i>				0.48 (0.70)	1.13** (3.12)	0.90* (2.40)
<i>RETURN</i>				0.19 (1.13)	0.10 (0.82)	0.12 (0.96)
<i>Leverage</i>				0.26 (0.55)	0.38 (1.33)	0.34 (1.15)
<i>Risk</i>				-0.15* (-2.19)	-0.11* (-2.52)	-0.12** (-2.86)
<i>BookToMarket</i>				-0.11 (-0.66)	-0.04 (-0.35)	-0.06 (-0.57)
<i>Constant</i>	-0.15 (-0.84)	-0.05 (-0.44)	-0.06 (-0.63)	-1.74* (-2.42)	-2.18*** (-5.95)	-2.04*** (-4.94)
<i>Age Group Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	415	1,141	1,556	415	1,141	1,556
<i>R-squared</i>	0.19	0.27	0.24	0.24	0.33	0.29
<i>Adj. R-squared</i>	0.16	0.26	0.24	0.20	0.31	0.29

*Notes to Table 5:*

This table reports coefficient estimates and t-statistics (in parentheses) for our regression models estimating the relationship between *Pension/Salary Ratio* and other elements of compensation (Bonus and Equity), scaled by salary. The White t-statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year.

\*\*\* p < .001

\*\* p < .01

\* p < .05

† < .10.

**Table 6: Corporate Governance Characteristics and Scaled Pension**

<b>Variables</b>	<b>(1) CEOs Only</b>	<b>(2) Non-CEO Executives</b>	<b>(3) All Executives</b>	<b>(4) CEOs Only</b>	<b>(5) Non-CEO Executives</b>	<b>(6) All Executives</b>
<i>ResidTotalPay/Salary</i>	-0.04** (-3.26)	-0.02** (-2.78)	-0.02** (-3.08)	-0.04** (-2.91)	-0.01* (-2.17)	-0.02* (-2.49)
<i>LogTimeInCompany</i>	0.23*** (4.07)	0.25*** (6.13)	0.24*** (6.39)	0.23*** (3.91)	0.24*** (5.59)	0.23*** (5.86)
<i>CEO</i>			-0.03 (-0.67)			-0.03 (-0.56)
<i>%NonExecOwnership</i>	-2.74** (-3.05)	-1.03 (-1.23)	-1.46† (-1.80)	-1.71† (-1.83)	0.12 (0.20)	-0.34 (-0.54)
<i>%BoardNonExecs</i>	0.15 (0.27)	0.56 (1.53)	0.43 (1.12)	0.16 (0.29)	0.61† (1.79)	0.48 (1.33)
<i>%RemcoBusy</i>	0.16 (0.70)	0.26† (1.79)	0.24 (1.57)	0.21 (0.85)	0.31* (2.25)	0.28† (1.91)
<i>BoardSize</i>	0.04† (1.87)	0.03* (2.62)	0.04* (2.60)	0.04† (1.76)	0.04** (3.22)	0.04** (2.88)
<i>ROA</i>				0.02 (0.03)	0.54 (1.15)	0.33 (0.73)
<i>RETURN</i>				0.12 (0.76)	0.06 (0.48)	0.07 (0.58)
<i>Leverage</i>				0.10 (0.21)	0.12 (0.36)	0.13 (0.37)
<i>Risk</i>				-0.16* (-2.08)	-0.16** (-3.35)	-0.16** (-3.26)
<i>BookToMarket</i>				0.05 (0.35)	0.16 (1.32)	0.12 (1.00)
Constant	-0.71 (-1.64)	-0.85** (-2.82)	-0.79* (-2.51)	-0.58 (-1.27)	-0.95** (-3.17)	-0.83** (-2.65)
<i>Age Group Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
Observations	409	1,114	1,523	409	1,114	1,523
R-squared	0.20	0.29	0.26	0.22	0.31	0.28
Adj. R-squared	0.17	0.28	0.25	0.18	0.30	0.27

*Notes to Table 6:*

This table reports coefficient estimates and t-statistics (in parentheses) for our regression model estimating the relationship between *ResidTotalPay/Salary* and *Pension/Salary Ratio*, with control variables for quality of internal corporate governance environment and executive personal tax status. The White t-statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year.

\*\*\* p < .001

\*\* p < .01

\* p < .05

† < .10.

**Table 7: Changes in Executive Pension–Salary Ratios**

Variables	(1)	(2)	(3)	(1)	(2)	(3)
	CEOs Only	Non–CEO Executives	All Executives	CEOs Only	Non–CEO Executives	All Executives
	$\Delta Pension/$ $Salary Ratio$					
$\Delta Bonus/Salary Ratio$	0.25 <sup>†</sup>	0.08	0.14*	0.28 <sup>†</sup>	0.08	0.15*
	(1.70)	(0.88)	(2.02)	(1.86)	(0.88)	(2.17)
$BonusSalaryDecreaseDV$	0.38*	0.11	0.20 <sup>†</sup>	0.39*	0.12	0.21*
	(2.05)	(1.05)	(1.97)	(2.08)	(1.15)	(2.05)
$\Delta Bonus/Salary Ratio^*$	–0.32*	–0.23 <sup>†</sup>	–0.21*	–0.35**	–0.23 <sup>†</sup>	–0.22**
$BonusSalaryDecreaseDV$	(–2.54)	(–1.89)	(–2.55)	(–2.74)	(–1.82)	(–2.65)
$\Delta Equity/Salary Ratio$				–0.00	–0.02	–0.01
				(–0.07)	(–1.00)	(–0.65)
$EquityDecreaseDV$				0.02	–0.02	–0.00
				(0.08)	(–0.15)	(–0.04)
$\Delta Equity/Salary Ratio^*$				–0.02	0.01	0.00
$EquityDecreaseDV$				(–0.28)	(0.26)	(0.07)
$LogTimeInCompany$	0.94*	0.00	0.21	0.92*	–0.01	0.19
	(2.14)	(0.02)	(1.06)	(2.01)	(–0.05)	(0.91)
<i>CEO</i>			–0.10			–0.08
			(–0.68)			(–0.54)
$\Delta FirmSize$	–0.63	–0.07	–0.16	–0.66	–0.07	–0.16
	(–1.32)	(–0.32)	(–0.65)	(–1.43)	(–0.28)	(–0.64)
$\Delta ROA$	2.31	0.34	0.56	2.13	0.27	0.48
	(1.26)	(0.24)	(0.53)	(1.21)	(0.18)	(0.44)
$\Delta RETURN$	0.08	0.24*	0.22 <sup>†</sup>	0.10	0.25*	0.24 <sup>†</sup>
	(0.39)	(2.00)	(1.73)	(0.52)	(2.20)	(1.97)
$\Delta Leverage$	0.07	0.96	0.52	0.05	0.92	0.50
	(0.14)	(1.10)	(1.03)	(0.09)	(1.06)	(1.02)
$\Delta Risk$	–0.38	–0.40	–0.41	–0.37	–0.42	–0.42
	(–1.12)	(–1.46)	(–1.60)	(–1.08)	(–1.50)	(–1.62)
$BookToMarket$	0.34	0.11	0.22	0.32	0.10	0.21
	(1.31)	(0.66)	(1.48)	(1.16)	(0.56)	(1.30)
<i>Constant</i>	–0.23	0.13	0.10	–0.21	0.18	0.15
	(–0.31)	(0.33)	(0.27)	(–0.27)	(0.43)	(0.38)
<i>Age Group Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	291	709	1000	291	709	1000
<i>R–squared</i>	0.16	0.06	0.07	0.16	0.06	0.07
<i>Adj. R–squared</i>	0.11	0.04	0.05	0.11	0.03	0.05

Notes to Table 7:

This table reports coefficient estimates and t–statistics (in parentheses) for our fixed effect regression specification estimating the relationship between  $\Delta Pension/Salary ratio$  and  $\Delta Bonus/Salary Ratio$  with interactive terms ( $\Delta Bonus/Salary Ratio * BonusSalaryDecreaseDV$  and  $\Delta Equity/Salary Ratio * EquityDecreaseDV$ ) which intend to capture the dynamic relationship between decreases in performance-related pay components and changes total executive pensions.  $\Delta$  is the change operator. The White t-statistics are based on heteroskedastic-consistent standard errors after clustering by firm, and results are similar when clustering by both firm and year\*\*\*  $p < .001$  ,

\*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$