DEAKIN UNIVERSITY AUSTRALIA

Faculty of Business and Law

School of Accounting, Economics and Finance

School Working Paper

ECONOMICS SERIES

SWP 2010/04

Pay for Performance and Corporate Governance Reform

Hristos Doucouliagos

Janto Haman

T.D. Stanley

Pay for Performance and Corporate Governance Reform

Hristos Doucouliagos[1]

Janto Haman[2]

T.D. Stanley[3]

Abstract

Directors' pay and corporate governance continue to generate public outrage and calls for reform. Our meta-regression analysis of all comparable UK pay-for-performance estimates finds little, if any, meaningful association between directors' pay and corporate performance. However, there is evidence of the effectiveness of past 'comply-or-explain' rules, especially the Cadbury Report. Unfortunately, the effects of past reform efforts tend to erode over time. The paper also explores differences between pay-performance estimates, finding that these are largely explained by how pay and performance are measured by a given study.

Keywords: Directors' pay, governance reform, meta-regression analysis

JEL classification: G3, M52, J33

[1]Corresponding Author: School of Accounting, Economics and Finance, Deakin University (Australia). douc@deakin.edu.au

[2]Department of Accounting and Finance, Monash University (Australia). Janto.Haman@buseco.monash.edu.au

[3]Department of Economics and Business, Hendrix College (United States). Stanley@hendrix.edu

Pay for Performance and Corporate Governance Reform

> "… the case for statutory rules is weak and so the Cadbury approach of trying to educate and persuade companies to make changes in corporate governance is probably the best one. …There already exist mechanisms that help to ensure that companies are well managed – such as the takeover mechanism. There is no reason to think that Cadbury is a substitute for these mechanisms".
>
> Hart (1995, p. 688)

1. Introduction

Pay for performance contracts are essential to motivate executives to achieve organizational goals.[1] Hence, they are of paramount importance to shareholders. Furthermore, executive pay is often of great concern to policy makers, in general, and regulators, in particular. Periodically, the public takes an active interest in the remuneration of Chief Executive Officers (CEOs). High levels of CEO pay are controversial, and the public seems poised to demand action. Indeed, scrutiny over CEO and directors' pay and governance issues has increased globally, especially since the collapse of several large corporations; for example, Enron and Worldcom in the US (Brick, Palmon and Wald, 2006). The 2007 global financial crisis has only intensified this interest (Kirkpatrick, 2009).

There are three broad policy approaches to governance: (1) rely solely on markets to determine contracts; (2) develop prescriptive rules and self-regulation such as 'comply or explain'; and (3) impose government rules and regulation. In practice, governments adopt some combination of these. If the market for corporate control is an effective governance mechanism and if the hiring and firing of CEOs is efficient, then restrictive prescriptions and regulations can be counterproductive, reducing social welfare (Hart, 1995). However, political and institutional pressure for reform has been fueled by the recognition that markets

do not always deliver effective governance; thus, a no intervention approach seems insufficient to protect shareholders' interests.[2]

Commencing with the Cadbury Report (1992), the UK has led the world through 'comply or explain' codes of practice.[3] A steady stream of reports on governance has contributed to the evolution of the comply-or-explain regime: the *Cadbury Code (1992)*; the *Greenbury Report (1995)*; the *Combined Code of Corporate Governance (1998);* and the revised *Combined Code of Corporate Governance (2003).* As a result of these reforms, UK corporate remuneration committees are required to include independent non-executive directors who are expected to align directors' pay with firm performance. These codes of best practice have been followed by legislative change. In particular, the *Directors' Remuneration Regulations (2002)* and the *Companies Act 2006* mandate that shareholders vote on directors' pay at annual general meetings.[4] The 2009 review of the Combined Code advocates further reform to: "emphasise the need for performance-related pay to be aligned with the long-term interest of the company …" (FRC 2009a, p. 3).[5]

In spite of considerable reforms, there remain questions of whether in the UK directors' pay is related at all to their firms' performance and whether the reforms have been successful in realigning directors' interests with shareholders. While many commentators and the public in general often resort to visceral opinions, good policy is informed by evidence. Given the intense interest, it is natural that a substantial and growing academic empirical literature has emerged on the links between directors' compensation and the performance of corporate entities. However, the assessment of what the available evidence can tell us is usually based on judgment rather than an objective summary of research (see Stanley 2001). Empirical results are often not consistent across studies, and studies differ in a number of important dimensions: employing different measures of remuneration and performance, using

different data and using alternative model specifications. These incommensurable differences make it very difficult to draw robust inferences using conventional qualitative reviews.

The diversity of empirical results, the importance of the topic and the continued efforts toward performance-based compensation provide our motivation to study comprehensively the extant empirical findings on the association between pay and performance in the UK. This study does not offer new estimates of the pay-performance association; rather, we draw new empirical inferences from the large extant research base, using meta-regression analysis (MRA). Applications of MRA in economics have been growing steadily (Stanley 2001). Examples include: Görg and Strobl (2001) on the spillover effects of multinational companies, Mookerjee (2006) on exports and growth, Disdier and Head (2008) on the effect of distance on bilateral trade, and Bellavance, Dionne and Lebeau (2009) on the value of a statistical life, to cite but a few. By putting the extant evidence through the microscope of MRA, it is indeed possible to draw several robust inferences concerning pay for performance in UK executive contracts.[6]

This paper applies MRA to the results from 44 empirical studies to answer four key issues regarding the marginal return to directors' effort. First, we explore the efficiency of contracts by testing whether executive remuneration is a function of corporate performance. Second, sufficient time has now passed and enough evidence has been reported from which to assess the effects of governance reform. Hence, we examine the research record for traces of the impact of self-regulation on pay for performance. Third, studies differ widely in their findings; thus, we employ MRA to identify the principal sources of heterogeneity amongst hundreds of reported pay-performance estimates. Finally, we explore whether the pay-performance association varies by firm size.

Existing studies rarely test directly the effectiveness of governance reform on pay for performance. They do, however, contribute important information towards such an

assessment.[7] The strength of MRA is that it is able to reassess the research record and explore dimensions of between study variation that often could not be considered by individual empirical studies. By analyzing the research record across time and controlling for difference in research design, we can quantify the effects of reform.

While a sufficiently large scale single study can be used to investigate the impact of government reforms, it is well know that even a large study will rarely resolve theoretical issues. Moreover, such a large study has yet to be carried out, mainly because of data issues. Our approach is to draw inferences from the available pool of studies. The advantage of meta-analysis is that it increases statistical power (Cohn and Becker, 2003) and it enables us to understand why studies differ in the results they report.

The paper is organized as follows. Section 2 reviews briefly the theory behind pay-for-performance. Section 3 describes recent code of practice and rule changes in UK corporate governance. Section 4 discusses the meta-regression methodology and the reported research results that define this study's data. MRA data are all of the empirical studies that report estimates of the pay-performance relationship. Section 5 presents and interprets the MRA results. Section 6 concludes the paper.

2. Theoretical Foundations

Our primary aim in this paper is to provide a quantitative review of the extant empirical evidence of the CEO pay-performance link. The relevant theory has been extensively covered elsewhere. Here, we present only a very brief sketch.[8]

Efficient remuneration contracts motivate CEOs and directors to focus on both the short- and long-term value of the company. These contracts should be transparent, reward success, punish failure, and discourage excessive risk taking. Boards operating with good governance and well-functioning remuneration committees are more likely to act in the best

interests of shareholders. Executives have incentives to divert corporate resources for their own private benefits but their ability to do so is limited by legal systems that protect the rights of shareholders (see Leutz, Nanda and Wysocki, 2003). In the absence of good corporate governance and strong shareholder protection, there is the risk that executives will maximize their own personal benefit potentially at the expense of shareholders (Jensen and Meckling, 1976; Fama and Jensen, 1983; Gompers, Ishii and Metrick, 2003).

The goal of reward schemes in remuneration contracts is to motivate managers to maximize the company's performance and shareholders' wealth. If this is the case, there should be a positive association between executive pay and corporate performance. However, in practice, weak governance may result in little or no actual link between pay and performance. In addition, other factors such as experience also influence executive remuneration and there are also internal and external factors that influence corporate performance. These include institutional rules and regulations, firm size, ownership structure, corporate governance attributes and, of course, macroeconomic and market conditions that affect all firms or all firms in the same industry. To address the inherent complexity, it is necessary to separate the various factors that influence pay and performance. Consequently, in their empirical analysis of the pay-performance association, researchers estimate some version of:[9]

$$\ln(W)_{it} = \alpha_0 + \beta_y y_{it} + \gamma_x x'_{xit} + \varepsilon_{it} \quad (1)$$

where ln denotes the natural logarithm, W is executive pay, y is company performance, *x* is a vector of other variables that affect pay (such as market conditions, firm size, characteristics of the executive such as age and tenure, relative performance evaluations, and corporate governance attributes), i and t index firm i in period t (when panel data are used), and ε is the

error term.[10] If firms design optimal contracts, then β_y should be statistically and practically greater than zero.

3. Governance in the UK

Concerns about executive pay in the wake of scandals such as Polly Peck, BCCI and Maxwell Communications led to a series of reports that advocated greater transparency in contracts. The 'Financial Aspects of Corporate Governance Committee' led by Sir Adrian Cadbury published the report which was later known as the *Cadbury Report (1992)*. This report outlined a number of recommendations to strengthen corporate governance, for example, the separation of the role of the CEO and chairman, the composition of non-executive directors on the board, transparency of financial reporting and the need for good internal controls. In particular, the *Cadbury Report* recommended that boards appoint remuneration committees consisting wholly or mainly of non-executive directors and chaired by a non-executive director.

The *Cadbury Report* was followed by the *Greenbury Report (1995)* that strengthened the establishment of remuneration committees that are accountable directly to shareholders. The remuneration committee is expected to be comprised exclusively of non-executive directors with no personal financial interest in the company, as well as no direct involvement in the company's management. The Hampel Committee was established to review the implementation of the *Cadbury* and *Greenbury* reports. The resulting *Hampel Report (1998)* made further recommendations on the structure and operations of the board and directors' remuneration and accountability. The *Hampel Report* led to the publication of the *Combined Code of Corporate Governance (1998)* to consolidate these reforms and recommendations.[11] After the 2009 review of the Combined Code, further changes were advocated to align directors' pay with the long-term interest of a company (FRC 2009a). The purpose of all of

these reforms is to strengthen the pay-for-performance link.[12] Evidence indicates that these codes have increased board oversight (Conyon, 1994; Dahya, McConnell and Travlos, 2002). But, do they actually strengthen the pay-for-performance link?

In contrast to a more legislative approach (e.g. the Sarbanes-Oxley Act in the US) that imposes a set of rules that apply to all companies, the emphasis in the UK has been on codes of practice that enable firms to tailor governance according to their circumstance, thereby balancing the needs of shareholders with managerial autonomy. While the Code is voluntary, firms are expected to comply. The London Stock Exchange requires all listed companies to report in their Annual Report their compliance with the Code. The Code has received wide institutional support but there has always been the threat of legislation if industry does not self-regulate. Indeed, there remain calls from some institutions to tighten regulation rather than rely on self-regulation (FRC 2009b, July).

Bruno and Faur-Grimaudy (2009) find that more than half of the FTSE350 firms were fully compliant with the Combined Code by 2004. Deloitte's (2004) review of the impact of Directors' Remuneration Report Regulations shows that most companies comply with the regulations, though many fail to communicate effectively: there is excess shareholder demand for communication, especially with regard to directors' bonuses.

4. Meta-regression analysis

The motivation behind meta-regression analysis (MRA) is the idea that a single study is unlikely to provide a definitive answer to a research question and that authoritative inference needs to be drawn from the results of all empirical research on a given topic (Stanley and Jarrell, 1989). By combining the results from numerous studies, meta-analysis results in *more precise* estimates of an effect than the individual studies themselves

(Kulinskaya, Morgenthaler and Staudte, 2008). Indeed, sampling error causes empirical results to appear to vary more widely than they really are. Sampling error is easier to detect and quantify within a pool of studies, than within a single study. Furthermore, MRA can explain systematic heterogeneity of empirical findings, thereby quantifying and explaining the variation in results within studies and between studies. Because this is all accomplished by objective statistical methods, MRA serves as a quantitative and 'scientific' literature review (Stanley, 2001).

4.1 The meta-analysis of the pay-performance link

For this application, MRA involves regressing comparable estimates of the partial correlations between pay and performance, against a constant and a vector (**Z**) of data, specification, and estimation differences that might affect the pay-performance association:[13]

$$r_{ij} = \beta_0 + \beta_1 Z_{ij} + u_{ij} \quad (2)$$

r_{ij} is the ith pay-performance partial correlation reported in the jth study and u_{ij} are the random errors. Equation 2 assumes that the dependent variable varies randomly around a central effect, β_0, and that this effect is moderated by the variables in the Z vector.[14] A test of H_0: $\beta_0 = 0$ is thus a test for whether the literature has established that pay is linked to performance. Efficient contracts require that $\beta_0 > 0$.[15] The size of β_0 informs shareholders and regulators about the strength of the pay-performance association.

While simple, equation 2 is an effective way of integrating the often diverse findings from numerous studies and to control for the effects of random error. We use equation 2 to test whether the pay-performance partial correlation (r) is positive and to quantify how it varies between studies. Equation 2 is a multivariate MRA that enables us to also explore the

effects of moderator variables on the estimated size of the pay-performance effect. That is, equation 2 is used to identify the variables that cause heterogeneity in the published estimates. This is detected when we find statistically significant coefficients associated with the Z vector of variables. For example, equation 2 can be used to identify whether the pay-performance effect is reported to have changed over time, whether there are differences between total compensation and bonus compensation, and whether there are differences between accounting and market-based measures of firm performance. These and other potential effects on the pay-performance association are investigated below.

4.2 The research base and the data used by this meta-regression analysis

A comprehensive literature search was conducted, using numerous search engines, as well as references cited in research papers, books, and working papers.[16] Five search criteria for inclusion in the MRA were adopted. First, the study had to use some measure of CEO pay or the remuneration of the entire board of directors as the dependent variable. Included are studies relating to total, cash, or base salary compensation, options, or bonus payments. We excluded studies that analyzed a pool of senior (non-director) executives, without offering estimates specifically for the CEO or for all board directors. Second, we are interested in the partial effect of performance on pay, after controlling for other factors that are likely to influence pay (equation 1). Hence, studies that reported only simple correlations between pay and performance were excluded. Third, the study had to be published, so that working papers are excluded. The inclusion of working papers is a controversial issue in meta-analysis, and we have preferred to side with caution in this analysis. Working papers might represent estimates that are still not finalized. They are also studies that have not yet gone through the refereeing process and, hence, might be of lower quality. The main consequence of this criterion is that we are excluding newer studies. However given that we still have over 500

reported estimates, our MRA is not unduly constrained by its sample size. Fourth, studies had to report sufficient information from which a comparable effect size could be calculated. This means that studies, which do not report significance levels or t-values and sample sizes, could not be included in the meta-analysis. Fifth, only research published in English and in academic journals is used.[17] These search criteria identify 44 studies that report a total of 511 estimates of the pay-performance association.[18] The studies are listed in Appendix 1.[19]

The included studies comprise our population of available studies defined by the above criteria. We are confident that the studies included in this meta-analysis are representative. We cannot use reported regression coefficients, because they are not directly comparable across studies.[20] Instead, we use the associated partial correlations. The partial correlation is a measure of correlation between pay and performance, controlling for all other effects on pay. Ideally, we need a measure of the pound increase in CEO pay associated with a 1% improvement in performance. This measure, however, is not available for many studies. Because we desire a comprehensive assessment of the empirical literature, we opt to use partial correlations to maximize our coverage of the extant research.[21] A statistically significant positive partial correlation indicates that CEO pay is positively associated with performance. The magnitude of the partial correlation further informs on the strength of the association. For a smaller number of estimates, we are able to calculate elasticities and semi-elasticities and refer to these below.

The meta-data are presented in Figures 1 and 2. Figure 1 is a simple bar graph that shows that two-thirds of the reported pay-performance associations show no practical link, according to the guidelines set by Cohen (1988).[22] Figure 2 is in the form of a funnel plot, showing the distribution of these estimates, with precision (the inverse of the estimate's standard error) on the vertical axis. Note that with a couple of exceptions the more precise

(higher) estimates tend to have a small pay-performance correlation. Precise estimates are the most reliable and informative.

Figure 1: Distribution of Pay-Performance Partial Correlations

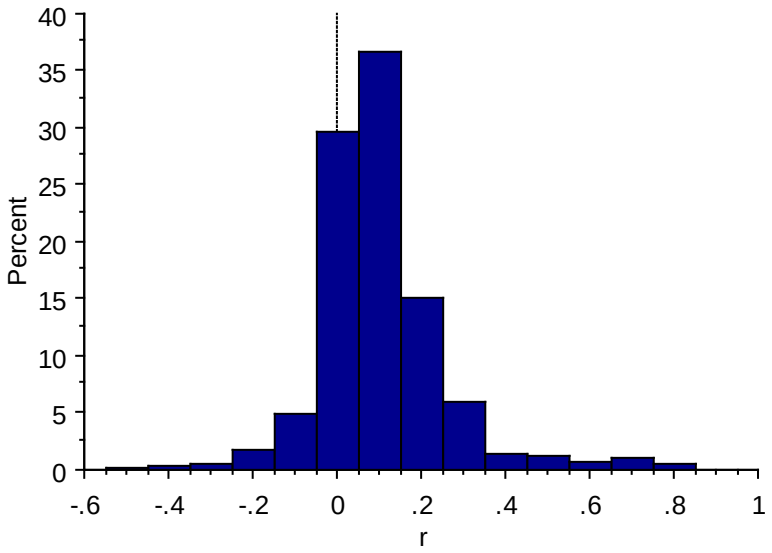


Figure 2: Funnel Plot of Pay-Performance Partial Correlations

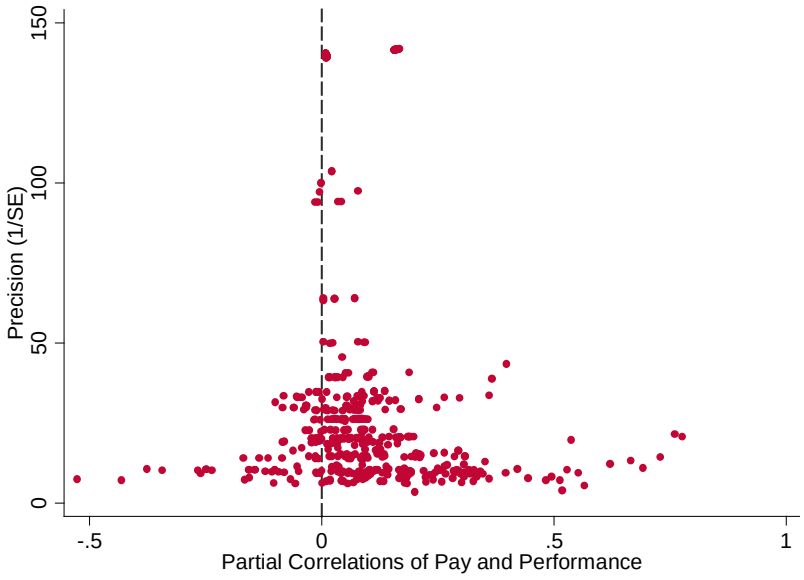
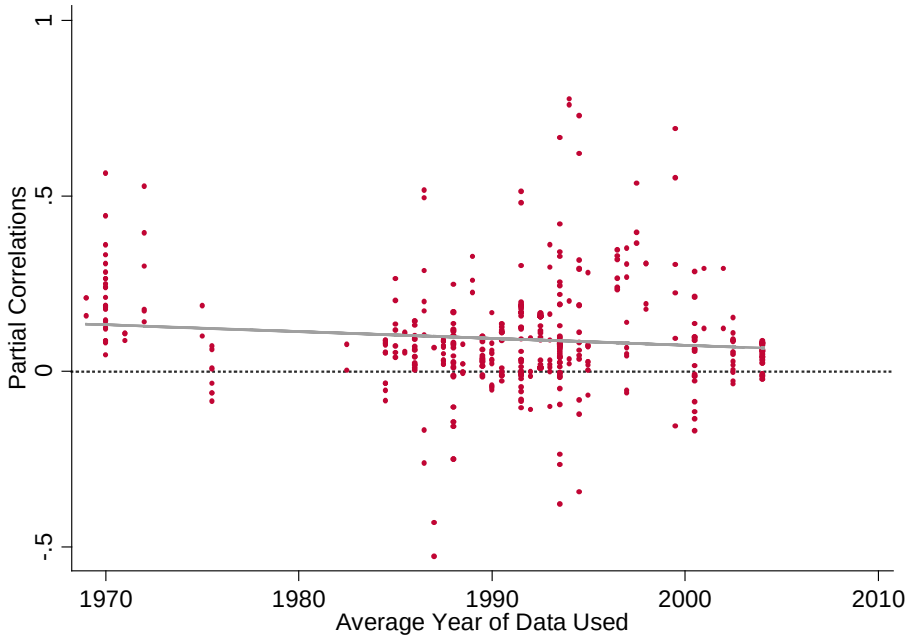


Figure 3 shows the same data points in chronological order. This graph reveals a declining trend of reported pay-performance partial correlations, falling by -0.002 per year (t=-2.79; p<.05). This trend becomes clearer and much stronger (-0.004) after other relevant determinants of reported pay-performance correlations are included our below multivariate MRA. This apparent weakening of incentives is discussed further below.

Figure 3: Pay-Performance Partial Correlations over Time



4.3 Potential limitations to systematic reviews

Before presenting our MRA results, we discuss some often encountered issues in meta-analysis and systematic reviews.

Study quality

We have tried to be as inclusive as possible in our choice of studies used in the MRA. Studies differ in a number of respects raising the issue of whether differences in the quality of studies might affect statistical inference. Our approach to this potential issue is to construct

weighted averages, by assigning greater weight to estimates from studies that are deemed to be of higher quality. Statistically, optimal weights are given by each estimate's precision squared; precision is the inverse of that estimate's standard error (Cooper and Hedges, 1994). More precise estimates are assigned a larger weight, because these values are more reliable and informative. Typically, this means that smaller studies are given less weight, as they tend to report estimates with less precision.[23]

Data dependence

Many of the 511 estimates result from using different econometric specifications and/or different measures of the dependent variable. Our meta-data are rich and enable a detailed exploration of heterogeneity between and within empirical studies. The one disadvantage, however, is that not all the estimates will be statistically independent of one another, which suggests that OLS might not be an appropriate estimator. While some studies report a single estimate, on average, studies report about eight estimates each. Hence, data dependence among estimates from the same study is a potential problem when calculating MRA's standard errors. Our approach to handling this is to use clustered data analysis in all the MRAs, treating estimates from the same study as a cluster of observations.[24]

Selection bias

Many economists have been concerned with the representativeness of publicly available empirical estimates, fearing that authors tend to submit, and journals tend to accept, statistically significant findings or those findings that are in accord with economic theory. (Delong and Lang, 1992). Indeed, most empirical investigations into the selectivity of economics research detect its presence (see, for example, Görg and Strobl, 2001; Roberts and Stanley, 2005; Mookerjee, 2006). On the other hand, some literatures have been found to be relatively free of it (*e.g.* Disdier and Head, 2008; Doucouliagos and Laroche, 2009). We have

reason to believe that this will not be an issue in the pay-performance literature. Doucouliagos and Stanley (2008) show that where a literature is vigorously contested with regard to the direction of some empirical effect, then selection bias will be minimal. In any case, it is always prudent to test formally for the existence of such selection bias and to accommodate its potential presence (Stanley, 2008; Stanley, Jarrell and Doucouliagos, 2010). Fortunately, in this area of research, there is no statistical evidence of publication selection ($t=0.33$; $p> .05$).[25] This MRA test result is further confirmed by noticing that there is little asymmetry in the funnel graph, Figure 2 (see also Stanley et al., 2010).

Other restrictions

Most studies do not identify the exact firms included in their samples. Hence, it is not possible to identify the degree to which the same observations are included in different studies. As a result, there may be some unknown data dependence across studies. This issue is likely to affect only efficiency, not bias, and the way the standard errors are best calculated. Moreover, the industry composition is unknown in most cases. Hence, we are unable to control specifically for industrial differences in the pay-performance link.

Another limitation is that if there have been measurement or reporting errors in the original studies, these will be carried over into the meta-analysis. However, such errors will likely be 'random' and thereby be properly absorbed by the MRA's error term.

Finally, we are obviously reliant upon the estimates reported by studies. The vast majority of studies report only the average response of pay to performance. With the exception of studies such as Conyon and and Schwalbach (2000), relatively little is known about the distribution of pay-performance effects between firms. It should be noted, however, that all of these issues apply to all reviews, including traditional qualitative (or narrative) reviews.

5. Meta-Regression Analysis Results

By subjecting the research record to rigorous statistical analysis, we can now address the four research questions posed in the introduction.

5.1 Is pay driven by performance? How large is the effect?

The average pay-performance partial correlation for all 511 estimates combined is +0.080, which is statistically significant at the 1% level. This average is calculated using the square of each estimate's precision as the weight, so that more precise estimates are given a greater weight.[26] When all studies and all estimates are considered, our meta-analysis confirms that CEO pay is positively correlated with performance. However, the representativeness of this average assumes that there is no important publication selection or heterogeneity. Although there is no evidence of publication selection bias, there is clear evidence of systematic heterogeneity, which is discussed in detail below.

Most prior reviews of this evidence have reached a similar conclusion that there is a positive pay-performance effect; however, meta-analysis enables us to quantify the size of this effect. A partial correlation of +0.08 is considered to be a trivial effect of no practical consequence, according to the guidelines set by Cohen (1988). For a subset of this research, we are able to calculate elasticities (n = 187). The weighted average of these elasticities is +0.01, which is not statistically significant nor of any economic consequence. We also identify 217 semi-elasticities. The weighted average semi-elasticity is +0.0003, which again is not statistically different from zero. Although all measures are consistently positive, we find no practically relevant pay-performance link when the entire research record is considered. This finding supports those who advocate further corporate governance reform.

5.2. The impact of governance reform and the sources of heterogeneity

What factors might explain the wide differences in the reported pay-performance effect within and between studies? Here our aim is to explore the heterogeneity among reported estimates with special attention on whether the strength of the pay-performance link has changed over time and on the effects of governance reform. Does the comply-or-explain regime affect the pay-performance link?

Table 1 presents the multivariate MRA regressions based on equation 2. Our aim here is to explain why the reported pay-performance estimates differ. All columns report the results of using weighted least squares, with precision (1/SE, the inverse of standard error) used as the weights.[27] Column 1 reports the mean and standard deviation for each covariate. Column 2 reports our base model consisting of four moderator variables. *AverageYear* is the average year of the data used to estimate equation 1. Figure 3 suggests that there is an important time dimension to the estimates, and *AverageYear* is included to capture any changes in reported effects over time. *Cadbury* is a binary variable taking the value of 1 for the period after the *Cadbury Report* (1992 onwards) and 0 otherwise. Similarly, *CombinedCode* is a binary variable taking the value of 1 for the period after the first Combined Code (1998) and 0 otherwise. The comply-or-explain regime was designed to strengthen the pay-performance effect and, hence, we include both of these two variables to capture these governance reform efforts. Both the *Cadbury Report* and the *Combined Code* represent important junctions in the development of corporate governance in the UK.[28] If reform were successful, then we should find a positive coefficient on at least one of these variables.

EcoFree is the average value of economic freedom associated with the data used to estimate pay-performance, as measured by the Fraser Institute. This notion of economic freedom assesses the overall degree to which markets are regulated in the UK.[29] According to

La Porta *et al*. (1998), greater reliance on market forces should increase shareholder influence and, hence, achieve stronger pay-performance links. Hence, we expect *EcoFree* to have a positive effect on the pay-performance link. That is, the more market orientated an economy is, the greater the reliance on markets to monitor and reward executives and address agency issues. A potential limitation for some of our MRA results, below, is that the inclusion of *EcoFree* may wash out the effects of comply-or-explain reforms because both deal with markets, regulations and voluntary contracts. In fact, the multiple correlation among these variables is greater than 0.7.

To this base model, column 3 adds six variables that capture differences in the way that the dependent variable is measured. *Cash* is a dummy variable taking the value of 1 if the estimate relates to cash compensation (salary plus bonus). Likewise, *Salary* relates to salary compensation only, *Bonus* to bonus pay, *Option* to options-based remuneration, *Changepay* to the change in compensation (rather than levels), and *Directpay* relates to the pay of all board directors. The omitted category is the level of CEO total compensation.

Column 4 adds six variables that capture differences in the measurement of performance. *Returns* is a dummy variable taking the value of 1 if the estimate relates to a market-based measure of performance, *ROE*=1 if a study uses return on equity, *Sales* = 1 if sales is employed as a performance measure (typically return on sales), and *Other* = 1 if any other accounting-based measure of performance (such as the level of profit and earnings per share) is used. For all of these performance variables, the base is return on assets (ROA). *Lagperform* is a dummy variable taking the value of 1 if the estimate relates to a lagged measure of performance, rather than a contemporaneous one. *Relative* is a dummy variable taking the value of 1 if the estimate is based on a relative measure of performance; that is, the performance of a firm relative to others in the industry.

Column 5 adds variables that capture differences in data, specification and estimation. Data differences are explored through *Panel,* a dummy variable taking the value of 1 if the estimate uses panel data, where cross-sectional data is the base. Specification differences are explored through six variables. *Firm Size* explores differences between studies that control for firm size and those that do not. Pay is expected to be a function of firm size (Tosi *et al.* 2000); therefore, the inclusion of firm size in the primary regression might affect the size of the estimated pay-performance effect. *Age, Tenure* and *Education* explore whether there are differences between studies that control for the CEO's age, tenure with firm and education level and those that do not. The use of a lagged dependent variable is captured by *Lagpay,* which to some degree accounts for model dynamics in the pay-performance relation. Finally, *Growth* is a dummy variable taking the value of 1 if the estimate controls for a firm's growth opportunities. We also include three variables to capture estimation differences. *NonOLS* denotes studies that estimate the pay-performance association using estimators other than OLS. *FirmEffect* and *TimeEffect* are binary variables for whether firm specific fixed effects and time period fixed effects were included in the estimation.

In Column 6, we add four variables that capture aspects of corporate governance. *Ownership* denotes CEO stock ownership; *Boardsize* denotes the size of the board; *Composition* denotes board composition, controlling for the presence of either outside or non-executive directors; and *Duality* is a dummy variable taking the value of 1 if the study controls for CEO board duality (where the CEO acts as Chairman or vice versa the Chairman acts as CEO).[30]

Column 6 reports the general model with all potentially moderating variables included. The MRA model reported in column 7 is derived by following a general-to-specific modeling strategy, sequentially eliminating statistically insignificant variables (p-values greater than 10%).[31] The main reason for adopting a general-to-specific modeling strategy is

to remove redundant or insignificant variables and, hence, to improve the clarity in which we can see the remaining variables. This modeling strategy is standard in meta-analysis. Because we have 31 potential explanatory variables, it is important to eliminate variables that are not statistically significant from the MRA so that we identify the individual trees from this forest.

TABLE 1 ABOUT HERE

In order to test the robustness of the results, we rerun the MRA under different scenarios. For example, we considered only estimates for CEOs, removing estimates relating to the entire board of directors. We separately removed any estimate using sales growth or sales/profit ratio as the performance measure. We removed the smallest and largest 5% of estimates. We also rerun the MRA treating each observation equally. The key results remain unaffected by these variations. These robustness checks are available from the authors.

Overall, the MRA estimates do an excellent job of explaining heterogeneity across the research literature. Our MRA explains around 80% of the variation in partial correlations (see columns 4 to 7, Table 1).

Time Variation

The negative coefficient on *AverageYear* confirms the time series pattern seen in the data (Figure 3) even after controlling for many other factors that affect this pay-performance relation. The magnitude of pay-performance link has been weakening over time (by 0.04 per decade, on average). This is consistent with rising managerial power and weakening board control over pay determination, enabling opportunistic directors to extract higher rents.

The most likely explanation for this trend is the relatively lax regulation of bonuses and options. The pay-performance association will fall over time if bonuses and options

become a greater part of remuneration in a lenient regulatory environment. Poor disclosure requirements make it difficult to assess the relative weight of bonuses and options over time, particularly prior to 1992. However, there is some evidence that the relative importance of bonuses and options has been rising, while the regulation of bonuses in the UK remains relatively weak (Bruce, *et al.* 2005).

A second explanation might be that there is a link between pay and firm size and this link might have grown stronger over time, for example, due to mergers and acquisitions, particularly during the 1990s. Directors might justify their rising pay more in terms of firm size and less so in terms of performance, so that over time size becomes relatively more important than performance. [32] The data show that firm size has been rising over time. For those studies that reported average firm size, we regress the average value of the natural logarithm of firm assets on the average year. This generates a positive time trend (+0.17, t-statistic = 1.92, n = 121). In order to explore the links between pay and firm size, we calculated 266 partial correlations between firm size and pay from these same studies. The MRA of this data reveals no trend in the pay-size association.[33] A constant pay-size association and an increase in the size of listed companies indicate that size is becoming relatively more important in pay increases.

Another explanation might be that this trend is an outcome of improved reporting standards over time, making it harder for managers to manipulate recorded profits. If the ability to manipulate profit reports is declining over time, then it might appear as if the pay-performance effect has been declining. In earlier years, if profit figures were more easily exaggerated, it would also be easier to peg higher pay to exaggerated performance. Over time, however, it has become more difficult to manipulate earnings, so that the pay-performance relation would then appear to weaken.

These findings are consistent with a climate of dynamic contracting. As directors' relative power rises, their pay becomes less and less linked to their firm's performance. Enter pressure from professional organizations and regulators, and we have an ongoing dynamic tension between directors, shareholders, institutions and regulators. Due to agency problems, company directors have an incentive to lessen the control that shareholders have to influence their pay. But periodically, new regulations, accounting standards or guidelines will come along to hold directors more accountable. As a consequence, we can get periodic shifts up in this pay-performance connection. Nonetheless, opportunistic CEOs and directors might then redouble their efforts to exploit weaknesses and loopholes, causing a gradual erosion of the association between pay and performance over time.

Regulatory Reform

Since the *Cadbury Report* and the *Combined Code*, disclosure has increased and companies are reporting more information on compensation contracts. The effect of these improvements has been to increase the pay-performance effect, as seen by the statistically significant positive coefficient for the *Cadbury* dummy variable. In order to test the robustness of this finding, we considered alternative ways to measure reform. Table 2 reports the results of several robustness tests, using alternative measures of reform embedded along with the other variables of the general-to-specific model of column 7, Table 1. For ease of comparison, column 1 reproduces the coefficient for *Cadbury* from column 7 of Table 1.

In column 2, *Cadbury* is replaced by *% Non-Exec*, which is the percentage of non-executives on the board.[34] In column 3, reform is measured by *%Separation,* the proportion of boards that separate the Chair and CEO. Once again, we constructed this variable by collecting estimates reported by several authors.[35] Column 4 includes *Cadbury* and replaces *CombinedCode* with *% Compliance*, the percentage of firms that are fully compliant with the

Combined Code.[36] Finally, in column 5, we replace *Cadbury* and *CombinedCode* with *% PostCad* and *% Post CombinedCode*, which are the percentage of observations in the post-Cadbury era and the percentage of observations in the post-Combined Code era, respectively.

In contrast to *Cadbury* and *CombinedCode*, these alternative reform measures are continuous. However, they capture only part of the reform process. In the absence of a comprehensive and continuous measure of overall reform, we prefer the binary measures of reform. In spite of this numerical richness, none of these alternative measures of reform are statistically significant. It is only the two *Cadbury Report* related variables, *Cadbury* and *%Post-Cadbury*, that are robustly statistically significant. As already noted, *Cadbury* and *EcoFree* are somewhat collinear, and *EcoFree*'s multicollinearity becomes extremely high when all of the other variables in column 7 of Table 1 are considered. In column 6 of Table 2, we replace *Cadbury* with *EcoFree* and find that *EcoFree*, nonetheless, has a positive and statistically significant coefficient.[37]

TABLE 2 ABOUT HERE

As a final robustness check, we separated the studies into those using *only* pre-reform (pre-1992) data and those using *only* post-reform data. There are 15 studies with 148 estimates derived from data that do not include the reform years. The average pay-performance effect from these is +0.05, less than the +0.08 when all data is used. There are also 17 studies with 198 estimates that do not include data prior to the reform years. The average pay-performance effect from these is +0.09, slightly higher than when all data is used, and significantly higher than when only the pre-reform data are used.

Taken together, all of these findings indicate that the voluntary code of practice regime did have some small positive effect on pay-for-performance. However the effect is

quite small, adding only about +0.04 to the average partial correlation. Moreover, according to the MRA coefficient on *AverageYear*, a decade is sufficient to eliminate the gains made by observed corporate reform efforts. Hence, in contrast to Hart's (1995) observations that the Cadbury report was probably the best way to proceed, MRA of the accumulated evidence suggests that the voluntary code has not managed to strengthen incentives sufficiently over the long run.

Measures of pay and performance

The base in the MRA is total compensation. When compensation is measured as cash (salary plus bonus), the partial correlations are significantly lower (-0.08 on average). Similarly, when compensation is measured in change form, rather than in levels, pay for performance is lower.

The measurement of performance appears to be a particularly important determinant of within and between study differences in estimates. The base in the MRA is return on assets (ROA). The coefficient on *Returns* indicates that pay for performance is greater when a market-based measure (typically shareholder returns) is used to measure performance. Market-based measures of performance are seen to be a forward looking measure and are thought to reflect the market value of the company in the long-run. In contrast, ROA is an accounting-based measure of performance and essentially is backward looking: ROA provides an accounting measure of past profits, whereas *Returns* provides an economic measure of expected profits. The coefficient on *Returns* is in line with our expectations; that is, pay for performance is greater for market-based measures. [38]

When performance is measured in terms of sales, the pay-performance effect is larger, implying that pay-performance is more likely to be linked to sales-based measures of performance.[39] The use of sales to measure performance is controversial, as it might also

measure the size of the firm[40], or the growth potential of the firm. Nevertheless, 16% of the estimates have used it as a measure of performance and this leads to higher pay-performance effects. The coefficient on *Sales* may be viewed as a measure of the effect of poor performance measurement.

A smaller pay-performance effect emerges when performance is measured with lags. In other words, the pay-performance association is larger when considered as a contemporaneous association. Most estimates use the current year's performance, although 26% use lagged performance. The MRA shows that including a lagged measure of performance reduces the magnitude of the reported pay-performance correlation. While endogeneity is a potential issue, estimates that are exclusively focused on options and bonuses, or which include these components of pay, will need to look at contemporaneous performance and this result in larger pay-performance effects.

Specification and estimation differences

No differences among estimators emerge from this MRA. However, there is some evidence that controlling for the director's education level reduces the size of the correlation by a rather large amount. What might be seen to be a reward for performance might, in part, be a reward for human capital. This finding implies that CEO education is positively related to both pay and corporate performance.

The inclusion of pay dynamics (*Lagpay*) increase pay-performance effects. This variable is picking up both the effects of specification and estimation. There is convincing evidence that there are lags in the administration of pay (see, for example, Boschen and Smith, 1995; Main *et al*., 1996). Hence, a well specified remuneration model should include lagged pay. The coefficient on *Lagpay* thus can be seen as a measure of the magnitude of misspecification when lagged pay is not included. At the same time, estimates with lagged

pay were predominately derived using the GMM estimator (though some are provided using OLS). Hence, *Lagpay* also captures the effect of different estimators and the net effects of unobserved variables. The coefficient on *Firm effects* suggests that omitting firm specific fixed effects does not result in biased estimates of pay and performance, once other aspects of studies are controlled for. To a large extent, this might be picked up by *Lagpay.*[41] However, the specification of equation 1 in change form is often adopted as a way to get rid of firm specific fixed effects, and the MRA results shows that this produces smaller pay-performance effects. There is some evidence that the inclusion of time effects produces slightly lower estimates of pay for performance. Taken together, the coefficients on *Lagpay* and *Time effects* imply that estimates of pay for performance that do *not* control for lagged pay and time effects will, on average, report partial correlations that are 0.04 lower.[42]

Board composition is an important moderator in the pay-performance association: Studies that fail to control for board composition overestimate the pay-performance effect. However, once measurement and data differences are considered, the inclusion of other corporate governance variables (e.g. board size) in a primary regression does not seem to further affect the size of the reported pay-performance effect.[43] These findings are not surprising considering that board composition is one of the areas on which reforms focus.

5.3 Effects of size

In a competitive labour market, firm-specific characteristics should not be important for compensation. However, empirical studies have found that compensation varies depending on characteristics of the firm (see, for example, Abowd, Kramarz and Margolis 1999). Unfortunately, research in this area rarely explores the effects of firm-specific characteristics on the magnitude of pay for performance.[44]

One dimension of between firm differences relates to the effects of the size of the firm on pay for performance. Does the marginal return to effort vary according to the size of the firm? Several papers have argued that the pay-performance effect is moderated by the size of the firm. Jensen and Meckling (1976) and Schaefer (1998) found that size also influences the compensation performance sensitivity, incentives are higher for smaller firms. Unfortunately, studies do not always report the average size of the firms in the sample used. We are able to match pay-performance correlations with only 93 estimates of the size of the firm in terms of total assets employed and 342 estimates of the size of the firm in terms of sales turnover. Ignoring other covariates, a simple MRA between the pay-performance correlation and firm size reveals a negative effect when assets are used to measure firm size, and no effect when sales are used to measure firm size.[45] Adding the natural logarithm of the average value of sales as a measure firm size to our MRA produces a coefficient of -0.005, with a t-statistic of -1.70 (for the general-to-specific specification, column 7 of Table 1), suggesting an inverse link between firm size and the size of the pay-performance effect, once other aspects of research are considered. Unfortunately, this inference is drawn from a significant reduction in the number of observations, from 518 to 342, and the level of significance is weak. Nonetheless, this is also consistent with the notion that the pay-for-performance link is eroding over time due to the increase size of listed firms.

6. Conclusion

The pay-performance association is of great importance. It lies at the heart of shareholder and public interests. Numerous theoretical and empirical studies have been published, often reporting quite diverse and conflicting results. The difficult challenge for scholars and regulators is to draw sound and robust inferences from this large and growing research record. Has governance reform worked? The business press remains skeptical (Mawson,

2009; Stevenson 2009), while the academic literature has produced a wide range of often conflicting results.

In this paper, we apply meta-regression analysis to 44 empirical studies that combined report 511 estimates of the pay-performance relation among UK corporations. Our meta-regression analysis draws several robust inferences from this research. Overall, this quantitative assessment of the research record finds little connection of CEO pay to corporate performance, when performance is measured as either ROA or shareholder returns. However, this link is moderated by several factors, not the least of which is the self- and mandated regulatory climate. The Cadbury Report and subsequent reforms appear to have strengthened the relation between CEO remuneration and shareholder returns. The effect of governance reform, however, has been relatively small. Reform had the effect of increasing a practically insignificant pay-performance effect to, at best, a small effect. Moreover, our MRA also reveals a robust declining time trend in the strength of this pay-for-performance link. This declining trend means that the small positive effect arising from reform vanished within a decade. This loss of effectiveness of reform could be driven by opportunistic CEOs seeking to weaken their shareholders' influence over their pay. Periodically, as new examples of corporate abuse comes to light, increased scrutiny leads to new codes and/or regulations, which, in turn, force directors to become more accountable, at least for a while. But incentives for CEOs and directors to reduce shareholder oversight remain. Over time, CEOs will discover weaknesses and loopholes in the new codes, gradually eroding the association between pay and performance. Potentially, the cycle repeats whenever effective new rules or regulations are adopted.

Our meta-regression analysis uncovers that there is much systematic variation among reported research results. In addition to a time trend and the comply-or-explain code reforms discussed above, this variation can be explained by: alternative ways pay and corporate

performance are measured, pay-performance dynamics, and the use (or omission) of human capital variables. Lags in both pay and performance also affect reported results. Pay seems to be more closely tied to current and forward-looking measures of performance, while pay has its own inertia.

Alternative measures of pay and performance also have substantial practical effects on this link. Using more market-based measures of corporate performance also substantially fortifies this link. When sales growth is used as a measure corporate performance, pay-for-performance correlations are further increased. However, this might reflect the importance of corporate size, rather than corporate performance, in determining CEO compensation. Together, these factors explain over three-fourths of the observed variation found in the research record.

The choice between comply-or-explain codes and legislation partly depends on whether investors or regulators are better at corporate governance and influencing salary contracts. Our MRA shows that the pay-performance link in the UK has been falling, indicating that market pressures are insufficient alone to address principal-agency problems and to protect shareholder interests. Although the MRA shows that institutional and regulatory pressure has bolstered the link between remuneration and performance, the observed association remains weak. Many shareholders still feel that the link between pay and performance is not clear or sufficiently strong (Deloitte 2004). Executive salaries will continue to grow, giving rise to new calls for heightened public scrutiny. On the one hand, an argument can be made that additional reform is needed in the UK to strengthen shareholder interests. On the other, it can be argued that ultimately it is up to shareholders to monitor and protect their own interests.

6. References

Abowd, J, Kramarz, F and Margolis, D. 1999. High wage workers and high wage firms. *Econometrica* 67(2): 251-333.

Baume, W.J. 1959. *Business Behavior, Value and Growth*. New York: Macmillan.

Bellevance, F, Dionne, G. and Lebeau, M. 2009. The value of a statistical life: A meta-analysis with a mixed effects regression model. *Journal of Health Economics* 28: 444-464.

Bertrand, M. and S. Mullainathan. 2003. Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy* 111(5): 1043-1075.

Boschen, J. F., Smith, K. J., 1995. You can pay me now *and* you can pay me later: The dynamic response of executive compensation to firm performance. *Journal of Business* 68: 577-608.

Brick, I.E., Palmon, O., and Wald, J.K. 2006. CEO compensation, director compensation, and firm performance: Evidence of cronyism? *Journal of Corporate Finance* 12: 403-23.

Bruce, A., T. Buck, T. and Main, B.G.M. 2005. Top executive remuneration: A view from Europe. *Journal of Management Studies* 42(7):1493-1506.

Bruno, A. S., an d Faure-Grimaudy, A. 2009. Corporate governance in the UK: Is the comply or explain approach working? *International Review of Law and Economics* 29 (2): 169-177.

Cadbury, A. 1992. *Final Report of the Committee on the Financial Aspects of Corporate Governance*, Gee, London.

Cohen, J. 1988. *Statistical Power Analysis in the Behavioral Sciences*. 2nd ed. Hillsdale: Erlbaum.

Cohn, L.D. and Becker, B.J. 2003. How Meta-Analysis Increases Statistical Power. *Psychological Methods* 8(3):243-253.

Conyon, M.J. 1994. Corporate governance changes in UK companies between 1988 and 1993, *Corporate Governance*, 2(2): 87-99.

Conyon, M.J. 1997. Corporate governance and executive compensation. *International Journal of Industrial Organization*. 15:493-509.

Conyon, M.J., Gregg, P. and Machin, S. 1995. Taking care of business: Executive compensation in the United Kingdom. *Economic Journal* 105: 704-14.

Conyon, M.J., Peck, S.I., Read, L.E. and Sadler, G.V. 2000. The Structure of Executive Compensation Contracts: UK Evidence. *Long Range Planning* 33:478-503.

Conyon, M.J. and J. Schwalbach. 2000. Executive compensation: Evidence from the UK and Germany. *Long Range Plannning* 33:504-526.

Cooper, H.M. and Hedges, L. V. (eds.) 1994. *Handbook of Research Synthesis.* New York: Russell Sage

Core, J., Guay, W. and Larcker, D. 2003. Executive equity compensation and incentives: a survey. Federal Reserve Bank of New York. *Economic Policy Review* 9:27-50.

Dahya, J, McConnel, J.J. and Travlos, N.G. 2002. The Cadbury committee, corporate performance and top management turnover, *The Journal of Finance* 57: 461-483.

DeLong, J. Bradford, and Kevin Lang. 1992. Are all economic hypotheses false? *Journal of Political Economy*, 100:1257-72.

Deloitte. 2004. Report on the impact of the directors' remuneration report regulations. *A Report for the Department of Trade and Industry, London.*

Disdier, Anne-Célia and Keith Head. 2008. The puzzling persistence of the distance effect on bilateral trade. *Review of Economics and Statistics*, 90:37-48.

Djankov, S. and Murrell, P. 2002. Enterprise restructuring in transition: A quantitative survey. *Journal of Economic Literature* XL: 739-792.

Doucouliagos, C. 1995. Worker participation and productivity in labor-managed and participatory capitalist firms: A meta-analysis. *Industrial and Labor Relations Review* 49:58-77.

Doucouliagos, C. and Stanley, T.D. 2008. Theory competition and selectivity: are all economic facts greatly exaggerated? *School Working Paper, Deakin Working Paper 2008-06.*

Doucouliagos, Chris, and Patrice Laroche. 2003. What do unions do to productivity: A meta-analysis. *Industrial Relations,* 42: 650-691.

Egger, M., Smith, G.D., Scheider, M., and Minder, C. 1997. Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal* 316: 629-634.

Fama E.F. and Jensen, M.C. 1983. Separation of ownership and control. *Journal of Law and Economics* 26: 301-25.

Financial Reporting Council, 2009a, *Review of the Combined Code: Final Repor*t, London.

Financial Reporting Council, 2009b, *Review of the Effectiveness of the Combined Code*. London.

Gompers, P., Ishii, and J., Metrick, A. 2003. Corporate governance and equity prices. *Quarterly Journal of Economics* 118:107-155.

Görg, H. and E. Strobl. 2001. Multinational companies and productivity: A meta-analysis. *The Economic Journal* 111:723-39.

Hart, O.D. 1995. Corporate governance: Some theory and implications. *Economic Journal*, 105, 678-689.

Hunter, J.E. and Schmidt, F.L. 2004. *Methods of Meta-Analysis: correcting error and bias in research findings*, Sage publications.

Jensen, M.C. and Meckling, W.H.. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3(4): 305-360.

Jensen M and Murphy K. J. 1990. Performance pay and top-management incentives. *Journal of Political Economy* 98: 225-264.

Kirkpatrick, G. 2009. The corporate governance lessons from the financial crisis, *Financial Market Trends*, OECD.

Kulinskaya, E., Morgenthaler, S. and Staudte, R.G. 2008. *Meta-Analysis: A guide to calibrating and combining statistical evidence*. John Wiley & Sons, Chichester.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. 1998. Law and finance. *Journal of Political Economy*, 106: 1113-1155.

Leutz, C., Nanda, D. and Wysocki, P.D. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69(1):505-527.

Main, B.G., Bruce, A. and Buck, T. (1996). Total Board Remuneration and Company Performance. *The Economic Journal* 106: 1627-1644.

Mawson, J., 2009, U.K. companies fall in value, but directors' pay holds up, *The Wall Street Journal (WSJ.Com) http://online.wsj.com/article/SB125054538931938167.html*

Murphy, K. 1999. Executive compensation. In, Ashenfelter, O. and D. Card (eds). *Handbook of Labor Economics* 3, North Holland: Amsterdam.

Mookerjee, R. 2006. A meta-analysis of the export growth hypothesis. *Economics Letters* 91: 395-401.

OECD 1999. OECD Principles of Corporate Governance, *Business Sector Advisory Group on Corporate Governance, Ira Millstein Chairman, Paris: OECD.*

Roberts, C. J. and Stanley, T.D. (eds) 2005. *Meta-regression analysis: Issues of publication bias in economics*. Oxford: Blackwell.

Rogerson, W.P. 1997. Intertemporal cost allocation and managerial investment incentives: A theory explaining the use of economic value added as a performance measure. *Journal of Political Economy* 105(4): 770-795.

Sloan, R.G. 1993. Accounting earnings and top executive compensation. *Journal of Accounting and Economics* 16: 55-100.

Stanley, T.D. 2001. Wheat from chaff: Meta-analysis as quantitative literature review. *Journal of Economic Perspectives* 15: 131-150.

Stanley, T.D 2005. Beyond publication selection. *Journal of Economic Surveys*, 19: 309–45.

Stanley, T.D. 2008. Meta-regression methods for detecting and estimating empirical effect in the presence of publication selection. *Oxford Bulletin of Economics and Statistics*, 70:103-27.

Stanley, T.D. and Jarrell, S.B. 1989. Meta-regression analysis: A quantitative method of literature surveys. *Journal of Economic Surveys* 3:54-67.

Stanley, T.D., Jarrell, S. B. and Doucouliagos, H.2010. Could it be better to discard 90% of the data? A statistical paradox, *The American Statistician* 64: 70-77.

Tosi, H.L., Werner, S., Katz, J.P., and Gomez-Mejia, L.R. 2000. How much does performance matter? *Journal of Management* 26(2): 301-39.

Stevenson, D., 2009, Executive pay: is it really excessive? *Money week http://www.moneyweek.com/news-and-charts/economics/executive-pay-is-it-really-excessive-44609.aspx*

Williamson, O.E. 1964. *The Economics of Discretionary Behavior: Managerial objectives in a theory of the firm.* Englewood Cliffs, N.: Prentice-Hall.

Table 1: Determinants of Heterogeneity in UK Pay for Performance Contracts
(Dependent variable = partial correlations between directors' pay and firm performance)

Variable	Mean (SD) (1)	Base model (2)	(3)	(4)	(5)	General model (6)	General to specific model (7)
Constant		**25.337**	**33.714**	**32.715**	**21.626**	14.960	**8.177**
		(2.87)	(4.06)	(4.07)	(2.19)	(1.31)	(2.85)
AverageYear	1991.8	**-0.013**	**-0.017**	**-0.017**	**-0.011**	-0.008	**-0.004**
	(8.01)	(-2.84)	(-3.99)	(-4.03)	(-2.15)	(-1.27)	(-2.79)
Cadbury	0.589	**0.058**	**0.057**	0.040	0.037	0.048	**0.037**
	(0.492)	(3.69)	(4.27)	(1.98)	(1.28)	(1.49)	(2.43)
CombinedCode	0.182	**0.079**	0.063	0.068	0.013	0.059	-
	(0.386)	(2.16)	(1.33)	(1.38)	(0.20)	(0.87)	
EcoFree	7.597	0.102	**0.143**	**0.137**	0.079	0.043	-
	(0.622)	(1.98)	(2.82)	(3.06)	(1.38)	(0.65)	
Cash	0.628	-	**-0.192**	**-0.183**	-0.133	**-0.132**	**-0.082**
	(0.484)		(-2.39)	(-2.31)	(-2.00)	(-2.09)	(-2.46)
Salary	0.149	-	-0.145	-0.140	-0.105	-0.093	-
	(0.356)		(-1.70)	(-1.64)	(-1.40)	(-1.35)	
Bonus	0.058	-	-0.117	-0.121	-0.045	-0.059	-
	(0.233)		(-1.64)	(-1.79)	(-0.62)	(-0.85)	
Option	0.058	-	-0.119	-0.110	-0.093	**-0.082**	-
	(0.233)		(-2.00)	(-1.91)	(-1.98)	(-2.19)	
Changepay	0.478	-	0.012	-0.012	-0.050	**-0.068**	**-0.053**
	(0.500)		(0.71)	(-0.77)	(-1.76)	(-2.13)	(-3.12)
Directpay	0.076	-	**0.043**	**0.057**	0.055	0.047	-
	(0.265)		(2.33)	(2.18)	(1.65)	(1.29)	
Returns	0.366	-	-	0.028	**0.055**	**0.059**	**0.058**
	(0.482)			(1.50)	(2.58)	(2.63)	(3.41)
ROE	0.014	-	-	0.148	**0.211**	**0.208**	**0.205**
	(0.117)			(1.60)	(2.55)	(2.70)	(2.52)
Sales	0.164	-	-	**0.138**	**0.143**	**0.143**	**0.143**
	(0.370)			(12.49)	(21.55)	(20.47)	(22.98)
Other	0.198	-	-	0.009	0.008	0.014	-
	(0.399)			(0.55)	(0.46)	(0.70)	
Lagperform	0.256	-	-	-0.031	-0.024	-0.022	**-0.032**
	(0.437)			(-1.73)	(-1.89)	(-1.84)	(-2.62)
Relative	0.065	-	-	-0.021	-0.021	-0.029	-
	(0.247)			(-0.93)	(-0.68)	(-0.91)	
Panel	0.564	-	-	-	-0.040	-0.035	**-0.048**
	(0.496)				(-1.15)	(-1.06)	(-2.11)
Firm Size	0.618	-	-	-	-0.010	0.001	-
	(0.486)				(-0.45)	(0.02)	
Age	0.086	-	-	-	0.093	0.087	-
	(0.281)				(0.77)	(0.75)	
Tenure	0.054	-	-	-	-0.028	-0.090	-
	(0.225				(-0.41)	(-1.26)	
Education	0.021	-	-	-	-0.215	-0.218	-0.105
	(0.145)				(-1.76)	(-1.82)	(-1.72)

Lagpay	0.161	-	-	-	0.071	**0.077**	**0.065**
	(0.368)				(1.96)	(2.16)	(3.78)
Growth	0.390	-	-	-	-0.023	-0.017	-
	(0.488)				(-1.31)	(-0.92)	
Non-OLS	0.123	-	-	-	0.014	0.019	-
	(0.329)				(0.25)	(0.35)	
Firm effects	0.188	-	-	-	-0.030	-0.048	-
	(0.391)				(-1.01)	(-1.44)	
Time effects	0.478	-	-	-	-0.014	-0.012	-0.025
	(0.500)				(-0.58)	(-0.47)	(-1.75)
Ownership	0.094	-	-	-	-	-0.087	-
	(0.292)					(-1.51)	
Boardsize	0.102	-	-	-	-	0.012	-
	(0.302)					(0.38)	
Composition	0.153	-	-	-	-	-0.055	**-0.055**
	(0.360)					(-1.82)	(-2.19)
Duality	0.150	-	-	-	-	0.001	-
	(0.358)					(0.06)	
Concentration	0.083	-	-	-	-	0.006	-
	(0.275)					(0.25)	
Adjusted R^2		0.38	0.40	0.80	0.82	0.82	0.82
$Wald_{-all}$		418.13	1255.87	28.15	40.59	58.85	505.68
		[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
$Wald_{-joint}$		9.31	11.99	4.32	0.86	1.64	-
		[0.00]	[0.00]	[0.02]	[0.43]	[0.21]	

Notes: Figures in parentheses are absolute values of t-statistics using clustered data analysis to correct standard errors for within study data dependence. All estimates are with weighted least squares, with precision used as weights. Bold coefficients are statistical significant at the 5% level. $Wald_{-all}$ reports the p-value for a Wald test for the joint significance of all variables included in the MRA. $Wald_{-joint}$ reports the p-value for a Wald test for the joint significant of the *Cadbury* and *CombinedCode*. The Adjusted R^2 relates to the OLS equivalent.

Table 2: Robustness checks, alternative measures of governance reform
(Dependent variable = partial correlations between directors' pay and firm performance)

Measure of reform	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Cadbury	**0.037** (2.43)	-	-	**0.032** (2.05)	-	-
% Non-Exec	-	-0.695 (1.32)	-	-	-	-
% Separation	-	-	0.064 (0.34)	-	-	-
% Compliance	-	-	-	-0.126 (1.29)	-	-
% PostCad	-	-	-	-	0.061 (1.81)	-
% Post CombinedCode	-	-	-	-	-0.028 (0.57)	-
EcoFree	-	-	-	-	-	**0.070** (2.09)
N (K)	44 (511)	44 (505)	41 (469)	44 (511)	44 (511)	44 (511)

Notes: Cells report only the parameter estimates for the alternative reform variables. The full MRA results are available from the authors. See Table 1, column 7 for the full specification of the model. Figures in brackets report the *absolute* value of the t-statistic, using cluster robust standard errors. All estimates are with weighted least squares, with precision used as weights. Bold coefficients are statistical significant at the 5% level. *%Non-Exec* is the average proportion of board members who are non-executives. *%Separation* is the average proportion of boards that separate Chair and CEO. *%Compliance* is percentage of firms that fully comply with the *Combined Code*. *%PostCad* is the percentage of observations from the post *Cadbury Report* era. *%CombinedCode* is the percentage of observations from the post *Combined Code* era. N is number of studies and K is the number of estimates.

Appendix 1: UK studies included in the meta-regression analysis (in alphabetical order)

Study number	Author (year)	Average partial correlation between pay and performance#	Study number	Author (year)	Average partial correlation between pay and performance
1	Benito and Conyon (1999)	+0.04*	24	Girma, Thompson and Wright (2006)	+0.02*
2	Bruce, Skovoroda, Fattorusso and Buck (2007)	+0.21*	25	Gregg, Machin and Szymanski (1993)	+0.05*
3	Buck, Bruce, Main and Udueni (2003)	+0.09*	26	Guest (2009)	+0.09*
4	Coakley and Iliopoulou (2006)	+0.29*	27	Haynes, Thompson and Wright (2007)	+0.18*
5	Conyon (1995)	-0.01	28	Ingham and Thompson (1993)	-001
6	Conyon (1997)	+0.07*	29	Ingham and Thompson (1995)	-0.02
7	Conyon (1998)	+0.01	30	Johnston (2002)	+0.25*
8	Conyon and Gregg (1994)	+0.05	31	Johnston (2005)	+0.27*
9	Conyon and Leech (1994)	+0.04	32	McKnight (1996)	+0.10
10	Conyon and Murphy (2000)	+0.01	33	McKnight and Tomkins (1999)	+0.13
11	Conyon and Nicolitsas (1998)	+0.08	34	McKnight, Tomkins, Weir and Hobson (2000)	+0.36*
12	Conyon and Peck (1998)	+0.08	35	Main (1991)	+0.13*
13	Conyon and Schwalbach (2000)	+0.04*	36	Main, Bruce and Buck (1996)	+0.11*
14	Cosh (1975)	+0.22*	37	Main and Johnston (1993)	+0.07
15	Cosh and Hughes (1997)	+0.07	38	Meeks and Whittington (1975)	+0.16*
16	Cragg and Dyck (2000)	+0.04	39	Ogden and Watson (2004)	+0.16*
17	Cubbin and Hall (1983)	+0.25*	40	Ogden and Watson (2007)	+0.27*
18	Dong and Ozkan (2007)	+0.06	41	Ozkan (2007)	+0.05
19	Eicholz et al. (2008)	+0.10	42	Smith and Szymanski (1995)	+0.03
20	Ezzamel and Watson (1998)	+0.06	43	Watson (1994)	+0.17
21	Ezzamel and Watson (2002)	+0.06	44	Watson and Wilson (2005)	+0.39*
22	Fattorusso, Skovoroda, Buck and Bruce (2007)	+0.09*			
23	Girma, Thompson and Wright (2002)	+0.08			

Notes: # this is the average of all estimates used in the MRA. Partial correlations calculated directly from the primary studies. * denotes statistically significant at least at the 10% level.

ENDNOTES

[1] In this paper, we focus exclusively on the remuneration of Chief Executive Officers (CEOs) and the Board of Directors. However, much of the analysis applies also to other senior personnel.

[2] Corporate scandals and failures create negative perceptions about governance that spillover to other corporations. This negative spillover might require corrective collective action.

[3] The *Cadbury Report* (1992) influenced the OECD's Principles of Corporate Governance (OECD, 1999). UK's comply or explain process has been adopted by many countries as an international benchmark.

[4] In one sense, the UK has a mixture of voluntary codes and mandatory rules. Indeed, the *Cadbury Report* itself warned that legislation will follow if the code of best practice was not adopted. However, Bruce, Buck and Main (2005) argue that the legislative changes are best viewed as lending *credibility* to self-regulation rather than being an additional source of intervention.

[5] The revised Combined Code will apply from June 2010 and is to be renamed "The UK Corporate Governance Code" (FRC, 2009a).

[6] The one notable meta-analysis on the pay-performance association is by Tosi, Werner, Katz and Gomez-Mejia (2000), who analyze the results from 29 US studies published between 1962 and 1998 and find a weak pay-performance association.

[7] While some researchers have used corporate data arising from greater disclosure to test the effects of governance variables on pay, most do not directly test the effects of reform.

[8] Reviews of this literature include Conyon, Gregg and Machin (1995), Gomez-Mejia and Wiseman (1997), Barkema and Gomez-Mejia (1998), Murphy (1999), and Core, Guay and Larcker (2003).

[9] This is a reduced-form linear model that is only broadly consistent with principal-agent models. The estimation of structural parameters is rare, partly because the theoretical models do not provide clear guidance on exact specification or identification.

[10] Unobservable company specific factors also play a role and are sometimes included in the modeling strategy.

[11] Other reports in the sequence include the *Rutteman Report* (1994), the *Turnbull Report* (1999), the *Myners Report* (2001), the *Higgs Report* (2003), the *Smith Report* (2003), and the *Tyson Report* (2003). In addition to these reports, there have been numerous initiatives on remuneration instigated by various professional bodies.

[12] The process of corporate governance reform was sanctioned by the UK government and initiated by various institutions, most notably: the Financial Reporting Council, the London Stock Exchange, the Confederation of British Industry, the National Association of Pension Funds, the Association of British Insurers, and the Consultative Committee of Accountancy Bodies.

[13] In the analysis below we also include factors that were not and could not be considered by the original research studies: trends in pay for performance, the degree of market liberalisation, and governance reform.

[14] That is, the MRA estimate of β_0 is the partial correlation equivalent of β_y from equation 1, averaged over comparable estimates from multiple studies and conditional on the moderator variables, Z.

[15] $\beta_0 < 0$, is consistent with cronyism (see Brick *et al*. 2006).

[16] The search for studies was ended in March 2009. Our meta-regression analysis does not include studies published after December 2008.

[17] Because we are focusing on only the UK pay-performance link, this English requirement does not reduce the number of relevant estimates.

[18] We have also excluded from the meta-dataset any estimate that related only to unlisted companies.

[19] The full reference list can be downloaded from the authors.

[20] Studies use different levels of scaling and different transformations, making regression coefficients difficult to compare directly.

[21] On the use of partial correlations for MRA, see Doucouliagos (1995) and Djankov and Murrell (2002). Partial correlations can be calculated from reported t-statistics. Where t-statistics were not reported in a study, we can derive them from the reported p-values.

[22] Researchers typically use Cohen's (1988) categories to denote the strength of an association, with less than 0.1 being trivial and between 0.1 and 0.3 being a small effect. A correlation needs to be at least 0.10 before it is considered to be 'small' (Cohen, 1988).

[23] An alternative weight is to use the Impact Factor of the journal in which the study was published (as reported in the Social Science Citation Index, SSCI, 2007). These can be considered to be measures of what the profession deems to be more important. We prefer the more traditional approach in meta-analysis, which is to use the estimate's precision as this is more objective and is based on the underlying statistical properties of the reported estimates (Hunter and Schmidt, 2004). Interestingly, we find no association between the precision of the reported estimates and the Impact Factors. Regressing precision on a constant and the journal's Impact Factor produces a coefficient (and t-statistic) on the Impact Factor of -0.92 (-0.47). That is, journals with larger Impact Factors do not appear to report more precise estimates. We also add Impact Factor to the below

MRA models, but it is never statistically significant. That is, the size of the reported pay-performance effect is not related to the Impact Factor of the journal in which the study was published.

[24] We use the studies themselves as the clustering variable. Treating authors as the clustering dimension produces similar results.

[25] The conventional test for publication bias is the Egger test (Egger *et al*., 1997) or the funnel-asymmetry test (Stanley, 2008), which regresses an estimate on its standard error, SE. The coefficient on SE from this MRA represents publication bias or asymmetry of the funnel graph. This test is known to have low power (Stanley, 2008). Including this term for publication selection in our MRAs, below, does not affect any of our findings; thus, all these results are robust to the potential presence of publication selection.

[26] These weights can be shown to be optimal (Cooper and Hedges, 1994).

[27] When a statistical package is used, the weights need to be specified as precision squared, or $1/SE^2$. Alternatively, WLS may be accomplished by multiplying the entire MRA equation (2) by precision, 1/SE.

[28] Below we also consider alternative measures of reform.

[29] http://www.freetheworld.com/index.html. The index is constructed by considering factors such as the size of government, the top marginal income tax rate, judicial independence, protection of property rights, legal enforcement of contracts, the mean tariff rate, regulatory trade barriers, capital controls, interest rate controls, and hiring and firing regulations, among others.

[30] Other corporate governance aspects are occasionally explored in this literature, but these are the aspects that have received the most attention.

[31] A Wald test confirms the redundancy of the omitted variables: 1.43 with a p-value of 0.169.

[32] Empire building models predict that managers will exploit weak corporate governance and increase the size of the firm (Baumol, 1959; Williamson, 1964). However, Bertrand and Mullainathan (2003, p. 1047) show that instead of building empires, managers might "prefer to avoid the difficult decisions and costly efforts" and instead opt to "enjoy the quiet life".

[33] While the average correlation for the 511 pay-performance partial correlations is +0.08, the corresponding average pay-size correlation is almost double, +0.14. However, the two 95% confidence intervals do overlap: +0.06 to +0.10 for pay and performance and +0.05 to +0.24 for pay and size.

[34] This variable is constructed by collecting estimates of board composition reported by: Cosh and Hughes (1987 and 1997), Conyon (1994 and 1998), Ezzamel & Watson (1998), Dahya et al (2002), Ogden and Watson (2004), Rayton and Cheng (2004), and Ozhan (2007a and 2007b). The number of firms in these samples are used as weights.

[35] The studies used to construct *% Separation* are: Cosh and Hughes (1987), Main & Johnson (1993), Conyon (1994), Conyon and Peck (1998), Benito and Conyon (1999), Dahya and Travlos (2000), Fattorusso *et al.* (2007), Ogden and Watson (2004) and Rayton and Cheng (2004). The number of firms in these samples are used as weights.

[36] This data is taken from Bruno and Faur-Grimaudy (2009).

[37] In unreported regressions, we re-estimated column 7 of Table 1 after instrumenting *EcoFree* with the value of economic freedom in the prior decade, as well as with the value of economic freedom in key Western European nations. As a further test, we re-estimated column 7 separately for the pre- and post-Cadbury period. *Cadbury* retains its statistical significance in all these specifications.

[38] Firms might prefer to use accounting measures if these are less noisy signals than market based ones (Sloan 1993). Rogerson (1997) argues that under certain conditions, tying compensation to accounting measures might induce optimal investment decisions to be made.

[39] ROE also has a positive coefficient. Like ROA, ROE is an accounting measure. The coefficient here reflects something specific about the few estimates that use this measure (mean is 0.014), hence, we do not place much attention on this result.

[40] Some studies use sales to measure both performance and firm size. Where the sterling value of sales is used, we treat the variable as a measure of firm size. Where sales growth is used or profit/sales, we use it as a performance measure.

[41] 78% of estimates that use lagged pay also control for firm fixed effects, 95% use panel data, and 74% do not use OLS.

[42] Note that the correlation between *Panel* and *Lagpay* is only 0.34. While 56% of estimates use panel data, only 16% controlled for lagged pay.

[43] Conyon (1997) also finds that governance innovations do not affect the pay for performance link. A full meta-analysis of the effects of governance on pay is outside the scope of this paper.

[44] Conyon and Schwalbach (2000) is a notable exception.

[45] Regressing the partial correlation on the natural logarithm of assets gives a coefficient of -0.019, with a t-statistic of -2.19. Using the natural logarithm of sales gives a coefficient of 0.001, with a t-statistic of 0.75.