Essays on CEO Compensation and Corporate Governance

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Abstract

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This thesis examines the determinants of CEO compensation. It consists of two main studies. The first investigates the effect of compensation consultants on CEO pay levels and incentives, using a sample of large UK firms from the FTSE 350 index from 2003 to 2011. Its key focus is whether the effect of compensation consultants persists after controlling for endogeneity. Using OLS regressions and controlling for firm, CEO and corporate governance characteristics reveals that the presence of compensation consultants is positively associated with both CEOs' pay level and the percentage of equity-based pay. However, the presence of compensation consultants is endogenous. After controlling for selection bias using firm fixed effects, CEO fixed effects and propensity score matching, no significant correlation is found between compensation consultants and the level and composition of CEOs' pay. This study also investigates the effect of governance quality, and finds that the effects of compensation consultants are different in firms with good and bad governance. Again, there is no evidence that compensation consultants are used by entrenched CEOs to increase total pay, even in firms with bad governance. In general, these results support optimal contracting models rather than managerial power models.

The second study investigates the relationship between foreign experience and CEO compensation using a sample of large UK firms from the FTSE 350 index from 2003 to 2011. It focuses on determining whether foreign experience is valuable to CEOs. The findings reveal that foreign CEOs and national CEOs with foreign working experience receive significantly higher levels of total compensation than those without, and that this foreign-CEO pay premium is stronger in firms that are more globalised. The results are robust to controlling for firm-specific economic and corporate governance characteristics, as well as endogenous CEO selection using propensity score matching. The results show that pay premiums are attributable to the specialist foreign expertise and foreign networks of CEOs, which stem from foreign experience rather than broader general managerial skills.

Declaration

I, Zhifang Zhang, declare that this thesis, entitled “Essays on CEO Compensation and Corporate Governance”, is my own work and has not been submitted in substantially the same form for the award of a higher degree elsewhere. Where the thesis is the result of joint research, this is clearly identified.

Zhifang ZHANG
February 2017

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There may be a great fire in our hearts, yet no one ever comes to warm himself at it, and the passers-by see only a wisp of smoke.

- Vincent Van Gogh

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1. Introduction

This thesis focuses on the determination of Chief Executive Officer (CEO) compensation. It is significant and novel, in that it fills a gap in the literature by investigating important, yet previously overlooked, governance institutions that drive CEO compensation outcomes.

Two major themes relating to CEO compensation are investigated. Specifically, Chapter 2 focuses on the role of compensation consultants as a determinant of CEO compensation, while Chapter 3 looks at the importance of international labour markets and foreign experience in driving CEO compensation outcomes. This research builds on extant studies. Previous research on the role of compensation consultants has not controlled efficiently for the endogenous selection of consultants. Such studies may therefore suffer from statistical biases arising from endogeneity or omitted variables. Previous studies have also largely overlooked the impact of CEO foreign experience on CEO compensation. These are the two main areas addressed in this thesis. In consequence, this thesis offers new empirical results and findings that significantly augment the scholarly literature on determinants of CEO compensation.

Executive compensation is a controversial topic that has attracted attention from a variety of stakeholders, including regulators, politicians, bank managers, customers, investors and academics (Conyon et al., 2013; Murphy, 2013). There are three main reasons for this: first, many CEOs receive massive amounts of money, attracting public attention; second, during the financial crisis, many bank executives received large bonuses despite huge bank losses; and third, US CEO pay relative to typical US household income has increased over time from about 100 times in 1993 to more than

200 times in 2006, raising doubt about whether CEOs are worth their cost (Conyon et al., 2013).

Mainstream academic research on executive compensation has its roots in agency theory, which plays an important role in corporate governance. This is because a primary feature of agency theory is that it allows researchers explicitly to incorporate conflicts of interest, incentive problems and mechanisms for controlling incentive problems (Lambert, 2001). Generally, shareholders (principals) hire professional executives (agents) to manage the firm on their behalf, leading to a separation of ownership and control in modern corporations. Berle and Means (1932) recognised this as an agency problem, and it was later formalised by Jensen and Meckling (1976). Within this framework, compensation plans are designed to align the interests of risk-averse, self-interested executives with the interests of risk-neutral shareholders. Accordingly, principal–agent models study trade-offs between risk sharing and incentives in the optimal design of compensation contracts.

There has been much discussion of whether and how corporations adequately solve the agency problem (Fama & Jensen, 1983). According to Murphy (1999), an effective compensation plan design plays a central role in value creation by helping resolve agency problems associated with attracting, retaining and motivating the right individuals. In other words, CEO compensation contracts may help reduce agency problems by encouraging behaviour that is consistent with the corporate strategy and risk profile of the organisation, and discouraging self-interested behaviour.

The rapid rise in CEO pay over recent decades in the US and the UK has sparked lively debate on the determinants of executive compensation. Whether CEOs are overpaid is central to the divergence of two main views: optimal contracting and

managerial power. The ‘managerial power’ view has its roots in traditional agency theory, but includes the extra element of executives’ ability to influence both the level and composition of their own pay packages. The main implication of the managerial power view is that CEO pay is actually part of the problem rather than a solution to the corporate governance problem (Conyon et al., 2013). Bebchuk and Fried (2006) argue that CEOs set pay in their own rather than shareholders’ interests, and that CEO pay is excessive.

On the other hand, the ‘optimal contracting’ approach to CEO compensation suggests that CEO pay is determined largely by market forces. Compensation contracts reflect the costs and benefits of arm’s-length bargaining between boards and CEOs, and provide efficient incentives for dealing with agency costs (Core & Guay, 2010; Hölmstrom, 1979; Kaplan & Rauh, 2010). In other words, optimal compensation contracts should motivate CEOs to focus on firm performance and maximise shareholders’ value as it is in their best interests to do so.

In order to align compensation design effectively with managers’ and shareholders’ interests, the institutions of pay setting are important. Key aspects of governance institutions include the structure of boards of directors, compensation committees, compensation consultants, and say on pay (Conyon, 2014). For example, Gregory-Smith, Thompson, and Wright (2014) find that, although the economic effect is small, executive compensation is positively associated with dissent in the remuneration committee report. Therefore, Chapter 2 focuses on compensation consultants as a key component of governance institutions, and investigates their effect on CEO pay levels and incentives.

In addition to these important governance institutions, the quantity of research on top managers' characteristics has increased dramatically. Bertrand and Schoar (2003) show that top managers have a significant effect on corporate behaviour, in that different managerial styles contribute to the heterogeneity of firms' investment, financial, and organisational decisions. Motivated by this economic study, scholars have tried to determine which characteristics of top managers are most important. Research has focused on four main sets of top managers' characteristics: tenure, functional experience, formal education and international experience (Finkelstein, Hambrick, & Cannella, 2009; Nielsen & Nielsen, 2011). The globalisation of the world economy has led researchers to focus on international factors that determine CEO pay. On the one hand, while the previous management literature has focused on managers' international experience affecting firms' behaviour and outcomes, it has overlooked whether these characteristics are beneficial from CEOs' perspective. On the other hand, the corporate governance literature has concentrated on investigating firm-specific international factors (e.g. foreign ownership, cross-border acquisitions, cross-listing) that determine compensation, neglecting the impact of CEOs' international experience on their own compensation. Therefore, Chapter 3 focuses on CEOs' foreign experience as a key aspect of CEO characteristics and investigates its effect on CEOs' total compensation.

This thesis uses data from the UK to test hypotheses relating to compensation consultants (Chapter 2) and international labour markets (Chapter 3). The UK provides an ideal context for several reasons. First, the UK disclosure requirements relating to compensation consultants have a long history in the form of the Directors' Remuneration Report Regulations (UK Government, 2002), effective since 2003. The US has required disclosure only since 2006. The UK thus provides a longer time

series, allowing an in-depth exploration of the role of compensation consultants. This marks out the UK as a particularly rich context in which to study compensation consultants over an extended period of time, especially relative to other countries.

Second, in terms of global labour markets, UK firms have a notably higher proportion of foreign CEOs, with more diverse nationalities than other countries. This is important, as it provides ample sample variation to examine the effects of CEOs' foreign experience on CEO pay. For instance, variation in the foreign experience variable used in the analysis presented in Chapter 3 would have been considerably lower if the study had focused on a continental European country.

Third, the UK generally has a high level of disclosure requirements in relation to executive compensation practices, providing the necessary high-quality CEO compensation data for the main outcome variables. This also helps with data collection and quality. Non-UK European countries do not have quite the same high level of disclosure relating to executive compensation and governance arrangements.

Fourth, the UK has a high level of global orientation with regard to acquisition activities (Allen & Overy, 2015), providing sufficient observations to conduct an event study, as well as maximising the implications of this thesis. This is important because, on the demand side, firms must have sufficient need to match their supply of talent to their demand for managerial expertise.

Fifth, the UK is one of the most investigated countries in executive compensation studies (e.g. Girma, Thompson, & Wright, 2006; Ingham & Thompson, 1993, 1995; Thompson, 2005). This thesis is thus able to build on previous findings and advance existing knowledge in terms of executive compensation.

For these reasons, the UK provides an interesting context to test claims relating to (i) compensation consultants as an institution and their relationship with executive compensation; and (ii) the effect of globalised executive labour markets and their effect on the price of CEO talent.

This thesis focuses only on CEOs, rather than on the top management team as a whole. This is because CEOs provide the most visible signals to shareholders, and they differ significantly from other top managers on a number of dimensions, including corporate influences, domestic influences and self-concepts (Daily, Certo, & Dalton, 2000; Norburn, 1989). There is also an implicit assumption that power and key decision-making authority are concentrated in the hands of CEOs (Herrmann & Datta, 2002).

The context of this thesis blends international business and corporate governance variables from several datasets. Previous studies have often utilised a few datasets; for example, US compensation studies use Compustat and RiskMetrics. For the purpose of providing a comprehensive analysis of a range of phenomena relating to CEO compensation, this thesis combines six separate sources: Datastream, Manifest, BoardEx, Thomson Reuters ASSET4, Thomson's SDC Platinum, and Hofstede's cultural dimensions. The data sample consists of any firm that has been a constituent of the FTSE 350 at any time from 2003 to 2011. The unit of analysis is the CEO per firm per year. The assembled dataset is used for the analysis provided in Chapters 2 and 3 of this thesis.[1]

It is important to illustrate the context and importance of the data prior to the substantive analyses described in Chapters 2 and 3. The following figures illustrate

[1] It is hoped that this dataset will be of potential utility to future studies.

important characteristics of the data and provide a useful backdrop to the material presented in subsequent chapters. Figures 1 to 3 present the evolution of the average values of the main outcome variables and test variables in this thesis over time. Figure 1 shows how CEO compensation evolves over time from 2003 to 2011. The average total compensation in the FTSE 350 increases from around £1.3 million in 2003 to £2.2 million in 2011, peaking at £3.6 million in 2009. In terms of pay composition, the proportion of salary decreases from 48 per cent in 2003 to 35 per cent in 2011. Unlike in the US, the salary component in the UK still accounts for a large proportion of total compensation. The proportion of bonuses increases from 18 per cent in 2003, peaks at 28 per cent in 2009 and then declines to 19 per cent in 2011. The proportion of equity increases from 34 per cent in 2003 to 46 per cent in 2011. While the proportion of bonuses is relatively stable between 2003 and 2011, the increasing proportion of equity offsets the decreasing proportion of salary. This indicates that a higher proportion of CEO compensation becomes performance-based between 2003 and 2011, aligning with shareholders' interests. From these data, it can be concluded that: (i) average CEO compensation appears to be trending upwards during this time period; (ii) there are periods when average CEO compensation may fall; and (iii) there is a shift toward equity-based compensation. This is consistent with Conyon's (2014) findings from US data. It is also consistent with principal–agent models which predict that CEO compensation will have a significant equity-based pay element.

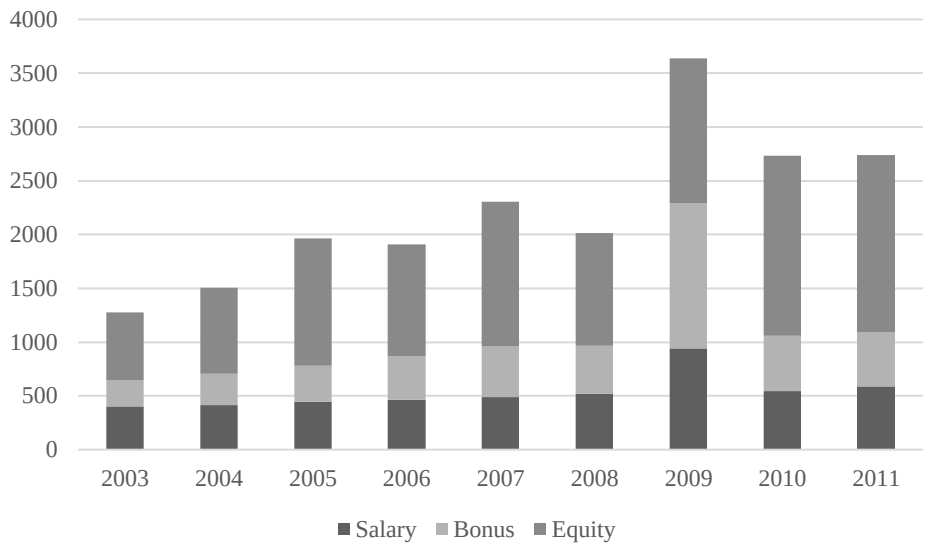


Figure 1: Average compensation for CEOs in FTSE 350 firms

Figure 2 illustrates the use of compensation consultants from 2003 to 2011. With minor fluctuations, the proportion of firms using compensation consultants is relatively stable at between 92 and 94 per cent. This stability is consistent with Chu, Faasse, and Rau's (2016) recent US study, which shows that 90 to 94 per cent of firms used compensation consultants between 2006 and 2012.

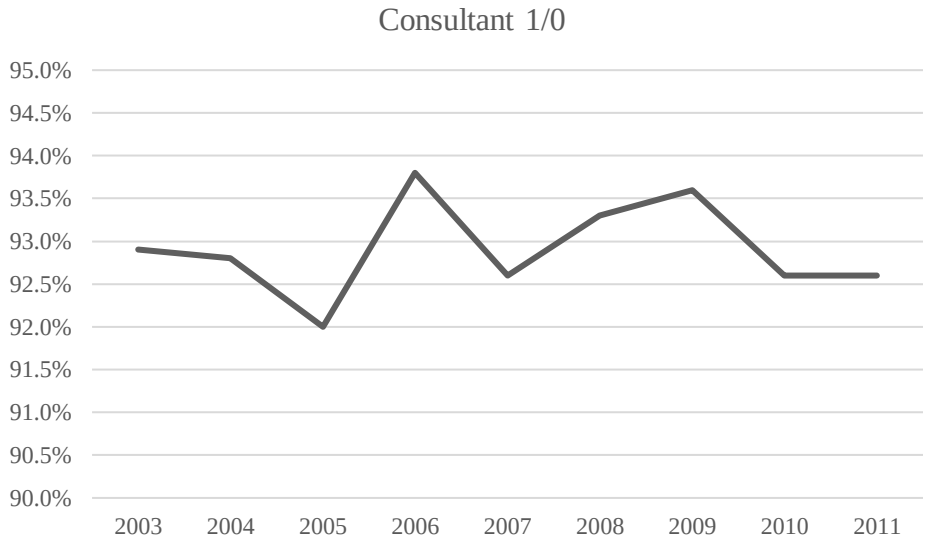


Figure 2: Average use of compensation consultants in FTSE 350 firms

Figure 3 shows the percentage of CEOs with foreign experience from 2003 to 2011. Around 20 per cent of CEOs were of foreign nationalities, 11 per cent had received

foreign education, and 52 per cent had foreign working experience. The data show that the percentage of CEOs with all types of foreign experience is relatively stable, with minor variations since 2007 and no sign of clustering in any particular year. As there is a high likelihood that firms will have CEOs of foreign nationality or with foreign education or work experience, it is interesting to investigate how each type of foreign experience contributes to CEOs' value.

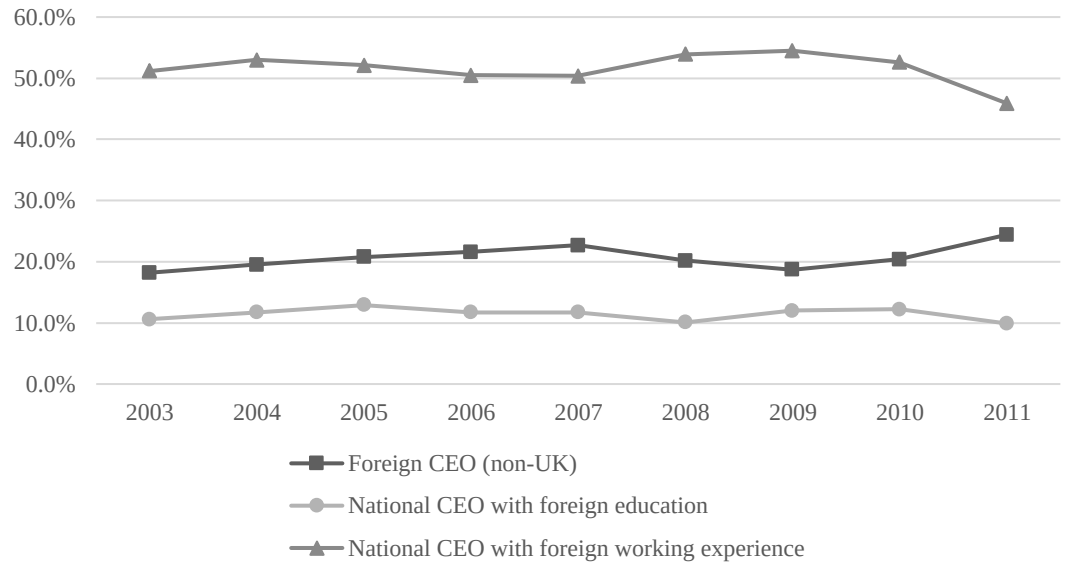


Figure 3: Average CEO foreign experience in FTSE 350 firms

The substantive part of this thesis comprises two self-contained chapters that share a common theme of CEO compensation. Chapter 2 investigates the relationship between compensation consultants, CEO pay levels and incentives. It is important to investigate the effect of compensation consultants on CEOs' pay, as consultants are widely used to help compensation committees design compensation packages for executives. Debate over how compensation consultants influence executive compensation arrangements centres around two alternative views. The optimal contracting view argues that compensation consultants provide unbiased market information and professional expertise to compensation committees, which helps them design compensation arrangements that efficiently align the interests of shareholders

and managers. In contrast, the managerial power view argues that consultants work under a conflict of interests, which leads to worse and non-optimal compensation packages.

Previous studies have documented a significant effect of compensation consultants on CEO pay. These have relied on cross-sectional data to investigate the effect of compensation consultants, and therefore it has been impossible to control for endogeneity. However, the selection of consultants by a firm is endogenous. Using a long panel of UK firms from 2003 to 2011, the study described in Chapter 2 provides stronger tests than previous studies of links between compensation consultants and CEO compensation by controlling for unobserved heterogeneity between firms, as well as selection bias. The key question is whether the effect of compensation consultants persists after controlling for endogeneity. If so, then the results of previous studies are robust. If not, then the puzzle of the influence of compensation consultants must be revisited, and inferences based on previous results must be cautious.

Using OLS regressions and controlling for firm, CEO and corporate governance characteristics, the study reveals that CEO pay is positively correlated with the presence of a compensation consultant. This finding is largely consistent with the previous literature. However, after controlling for potential selection biases by using firm-level fixed effects regression, as well as CEO-level fixed effects and propensity score matching, no significant relationship is found between compensation consultants and the level and composition of CEO pay. Therefore, these results strongly suggest that the significant consultant effect identified by previous OLS regressions may be largely explained by selection bias and/or unobservable time-invariable omitted

variables. There is also no evidence that compensation consultants are used by entrenched CEOs to increase total compensation, even in firms with 'bad governance'.

Chapter 3 investigates the relationship between foreign experience and CEO compensation. Globalisation has a profound effect on product and labour markets, and increasingly on CEO labour markets. The previous literature provides a range of evidence on how CEO foreign experience may be beneficial to firms, while potential private benefits to CEOs themselves have not been thoroughly explored. The key question is whether foreign experience is valuable to CEOs. In Chapter 3, this question is addressed by investigating whether CEOs earn a premium if they are foreigners or have significant foreign experience, relative to their domestic counterparts. In doing so, the aim is to expand existing understanding of how CEO characteristics influence total CEO compensation.

This thesis uses resource dependence theory to argue that CEOs with foreign experience provide vital resources (i.e. human and social capital) in connecting a firm to its international environment. Upper echelons theory is used to argue that firms with international CEOs will be inclined to expand into foreign markets. Foreign experience is rare and valuable. Firms intending to hire CEOs with such foreign experience will therefore be willing to offer compensation premiums. In addition, it is argued that CEOs' foreign experience is more important and better realised in firms with higher levels of international dependence. Therefore, it is predicted that CEOs' foreign experience will be positively associated with total CEO compensation, and that the effect of CEOs' foreign experience will be stronger as firms' levels of internationalisation increase.

Using a sample of UK firms from 2003 to 2011, the findings reveal that foreign CEOs and national CEOs with foreign work experience receive significantly higher levels of total compensation than those without, and that the pay premium is stronger in firms that are more globalised. These results are robust to controlling for firm-specific economic and corporate governance characteristics, as well as endogenous CEO selection, using propensity score matching. Further analysis reveals that the pay premium is attributable to specialist foreign expertise rather than broader general managerial skills.

In summary, this thesis aims to advance existing knowledge of the determinants of CEO compensation by contributing to the academic literature on both corporate governance and international business. Chapter 2 makes several contributions to the literature on compensation consultants and CEO pay. First, unlike most previous studies on compensation consultants that have only used cross-sectional data, this study uses a long panel of data on UK publicly-traded FTSE 350 firms from 2003 to 2011. This provides no evidence of any significant effect of compensation consultants on the level of CEO pay and structure of CEO incentives after taking into account the endogenous selection of consultants and firm/CEO fixed effects. The evidence does not support the claim of the managerial power model that consultants raise CEO pay or tilt compensation contracts in favour of entrenched CEOs at the expense of shareholders. Second, this study investigates firms with observable *ex ante* strong and weak corporate governance arrangements separately. No evidence is found that consultants are used by entrenched CEOs to increase total pay inappropriately, even in firms with bad governance. In general, the conditional available evidence rules out the managerial power model, making the optimal contracting explanation more plausible.

Chapter 3 makes several contributions to the literature on the impact and relevance of CEO characteristics from the CEO's perspective. First, the research sheds light on the economic value of foreign experience to the CEO, as measured by the CEO compensation premium. Second, the results suggest that the pay premium depends on CEOs' foreign experience, which generates specific foreign expertise and networks, rather than CEOs' general managerial skills, indicating that specialist CEO skills are valuable to the CEOs themselves. Third, this is believed to be the first study to provide a detailed analysis of different types of CEO foreign experience, ranging from foreign nationality to foreign education.

The thesis is organised as follows. Chapter 2 investigates the effect of compensation consultants on CEO pay levels and incentives, Chapter 3 investigates the relationship between foreign experience and CEO compensation, and Chapter 4 discusses the conclusions and implications of the two studies.

2. Compensation Consultants and CEO Pay: UK Evidence[2]

This chapter focuses on compensation consultants as a key component of governance institutions in determining CEO compensation. On the one hand, compensation consultants are theoretically relevant because they supply expert information to boards of directors and compensation committees. On the other hand, they may not have an incremental impact in addition to firm and corporate governance characteristics. The study provides empirical evidence of circumstances under which compensation consultants do or do not influence CEO compensation.

2.1 Introduction

This study investigates the relationship between compensation consultants, CEO pay and managerial incentives. Specifically, it addresses whether consultants raise CEO pay and/or change the structure of incentive-based pay. The central issue is whether pay consultants impede or improve compensation arrangements in the boardroom. The study contributes to the literature on compensation consulting, CEO pay and optimal contracting (Armstrong, Ittner, & Larcker, 2012; Conyon, Peck, & Sadler, 2009; Murphy & Sandino, 2010).

Compensation consultants are hired by boards of directors to recommend and advise on the appropriate level and design of executive compensation arrangements. However, there is debate as to the efficacy of such consultants. Agency theorists argue that pay consultants align the interests of owners and managers and help alleviate moral hazard risks arising from the separation of ownership and control. Thus, pay arrangements are largely optimal, set against inevitable contracting costs (Conyon,

[2] This chapter is co-authored with Martin Conyon, Lars Helge Hass, Simon Peck and Graham Sadler. We intend to further develop the chapter into a paper and submit it to a journal.

Peck, & Sadler, 2009; Murphy & Sandino, 2010). Conversely, managerial power theorists assert that consultants are captured by powerful CEOs and lead to worse and non-optimal pay outcomes in the boardroom (Bebchuk & Fried, 2009; Committee on Oversight and Government Reform, 2007). Thus, pay arrangements favour CEOs at the expense of owners.

Disentangling these two claims is fraught with difficulty, not least because firms' selection of consultants is endogenous and/or prone to missing variable problems. Previous research has also been hampered by data availability. For example, earlier studies had to rely on cross-sectional data that precluded the use of panel-data methods. Such studies could not, therefore, control for unobserved, largely fixed heterogeneity between firms, such as corporate culture or managerial skills. Therefore, the key question is whether the effect of compensation consultants persists after controlling for endogeneity. This study provides much stronger tests of the links between pay consultants and CEO compensation, using a specially designed panel of UK data from 2003 to 2011.[3] This allows unobserved heterogeneity between firms to be controlled for, as well as enabling the selection (treatment group) versus non-selection (control group) of consultants to be modelled.

The UK provides an ideal research context for this study. First, the UK disclosure requirements relating to compensation consultants have a longer history than in the US, in the form of the Directors' Remuneration Report Regulations (UK Government, 2002). As mandatory disclosure of compensation consultants was introduced three

[3] The UK context is particularly salient because information on compensation consultants has been available since 2003. Disclosure of information on executive compensation consultants is required in the UK by the Directors' Remuneration Report Regulations (2002), which mandate firms to disclose the name of the consultant and whether services in addition to compensation advice have been provided.

years earlier than in the US, the UK provides sufficient time-series data to allow a fuller exploration of the role of compensation consultants. Second, the level of disclosure requirements in terms of executive compensation is high in the UK, and may be comparable to the high standards pertaining in the US market (Vander Bauwhede & Willekens, 2008). Hence, the UK provides the necessary high-quality CEO compensation data for this research.

This study makes the following important contributions to the literature on pay and governance. First, because it uses a long panel of data on UK publicly-traded FTSE 350 index firms from 2003 to 2011, both cross-sectional and time-series relationships between CEO compensation and compensation consultants can be tested. Most previous research has focused only on cross-sectional variation in the pay and compensation consultant relationship. In this study, the cross-sectional results show that the presence of consultants is positively associated with the level of compensation and the percentage of incentive-based pay. At first sight, this is broadly consistent with the managerial power claim that consultants raise CEO pay. However, exploiting the time-series nature of the data reveals that these findings do not adequately control for firm-specific heterogeneity in factors such as corporate culture, managerial skills and the endogenous selection of consultants. When such factors are controlled for, the effect of consultants on CEO pay is much less clear-cut.

Second, the results reveal that the effect of pay consultants on the level of CEO pay and the structure of CEO incentives disappears after controlling for firm- and CEO-level fixed effects. In addition, they show that the average treatment effect of the treated (ATT) consultant on CEO pay and incentives is zero. After accounting for the endogenous selection of consultants and firm-/CEO-level fixed effects, there is no

econometric evidence that consultants raise CEO compensation levels. Therefore, the evidence does not support the claim of the managerial power model that consultants raise CEO pay or tilt compensation contracts in favour of entrenched CEOs at the expense of shareholders.

Third, the study investigates firms with observable *ex ante* strong and weak corporate governance arrangements separately. It might be expected that it is precisely in firms with poor corporate governance that CEO entrenchment effects are more likely to be observed, and where shareholders face greater moral hazard risk. OLS regression results show that the effects of compensation consultants are different in strong and weak governance firms. However, there is no evidence that consultants are used by entrenched CEOs to increase total pay inappropriately, even in firms with bad governance. Again, using firm fixed effects to control for omitted variables bias, no relationship is found between compensation consultants and CEO compensation in either strong or weak governance firms. In general, then, the conditional available evidence rules out the managerial power model, making the optimal contracting explanation more plausible.

This chapter proceeds as follows. Section 2.2 provides an overview of the relevant literature and presents the development of hypotheses; Section 2.3 describes the sample, methodologies and variables used; Section 2.4 provides summary statistics and empirical results; Section 2.5 presents further analyses; and Section 2.6 provides conclusions.

2.2 Background, Literature Review and Hypothesis Development

2.2.1 The role of compensation consultants

Compensation consultants are hired by boards of directors to recommend the level and structure of CEO and executive compensation. Baker, Jensen, and Murphy (1988) were the first to point out the importance of such consultants in designing compensation contracts to motivate CEOs, arguing that they supply valuable market information to boards. Main et al. (2008) also document the important roles played by compensation consultants, both in providing market data and in putting forward ideas on compensation design.

Policy makers, on the other hand, have been concerned that compensation consultants face significant conflicts of interest, and have introduced enhanced disclosure legislation on the relationship between pay advisors and boards of directors. In the US, the Dodd-Frank Act (US Congress, 2010) mandates that firms disclose who their compensation advisors are, and whether they were hired by the board of directors or by management. The UK disclosure requirements relating to compensation consultants have a longer history, in the form of the Directors' Remuneration Report Regulations (UK Government, 2002), than in the US.[4] These disclosure requirements mean that a firm's remuneration report must identify anyone who has provided the compensation committee with advice or services or who has materially assisted the

[4] UK regulatory changes in the form of the Directors' Remuneration Report Regulations 2002 came into force on 1 August 2002, and are effective for financial years ending on or after 31 December 2002. To ensure data availability, the sample for this study began in 2003.

committee in its consideration of any such pay matter.[5] UK firms are not required to identify whether management or the board hired the consultant, which is different from the US (Conyon, Peck, & Sadler, 2009), nor to disclose the fees for compensation services versus fees received for other non-compensation-related work. This limits studies of compensation consultants in the UK, since other potential conflicts of interest facing consultants (e.g. being hired by management rather than the board) are more difficult to identify.

The literature is divided on the precise role of compensation consultants. On the one hand, optimal contracting theory argues that firms and boards use compensation consultants because they optimise the structure of the pay package (Conyon, Peck, & Sadler, 2009). Specifically, consultants work with independent compensation committees to evaluate and propose appropriate pay contracts. In consequence, they align the interests of shareholders and managers more effectively, and reduce moral hazard in the principal–agent relationship (Fama & Jensen, 1983). According to Bebchuk and Fried (2009), 'The use of consultants can be explained within the optimal contracting framework on grounds that they supply useful information and contribute expertise on the design of compensation packages.'

[5] The UK disclosure rules mean that if a committee of the company's directors has considered matters relating to the directors' remuneration for the relevant financial year, the directors' remuneration report should (a) name each director who was a member of the committee at any time when the committee was considering any such matter; (b) name any person who provided the committee with advice or services that materially assisted the committee in its consideration of any such matter; and (c) in the case of any person named under paragraph (b) who is not a director of the company, state (i) the nature of any other services that that person has provided to the company during the relevant financial year, and (ii) whether that person was appointed by the committee. The provisions of part (b) indicate that if a company uses an external compensation consultant, that consultant must be named. Moreover, part (c) sub-section (i) indicates that if the consultant provides other services, this must be identified. Finally, part (c) sub-section (ii) requires the firm to disclose whether the committee appointed that consultant.

From an optimal contracting perspective, a pay consultant is a specialist market institution/actor who supplies valuable expert information to firms at a lower cost than the firm itself can manufacture such knowledge itself (Conyon, Peck, & Sadler, 2009). In addition, the pay consultant has market expertise and can evaluate proposals and ideas raised by the compensation committee. In return for services, the compensation consultant receives a fee from the client. Consultants have powerful incentives to supply accurate and unbiased information to client firms. Consultants supplying biased or partial advice will suffer reputation loss in the market and put potential business from other firms at risk. They will also risk losing future business as a result of shareholder outrage if CEO compensation levels are set too high.

Alternatively, managerial power theory argues that compensation consultants are captured by powerful CEOs, leading to inefficient pay contracts that are incongruent with shareholder interests (Bebchuk & Fried, 2009). Several rationales are adduced to support this view. First, there is the repeat business hypothesis. A compensation consultant who recommends a low level of CEO compensation is unlikely to win favour with a powerful CEO. In consequence, the consultant may be fired for suggesting such a 'low' CEO pay level, jeopardising repeat business with that firm. Also, compensation consultants may perceive a powerful CEO as being the principal, rather than shareholders. In such cases, compensation consultants may suggest compensation packages that are more favourable to the CEO. Second, conflicts of interest arise from supplying different services to the client firm. For example, a pay consultant may offer both CEO compensation services and other general human resource advice, such as company-wide pension arrangements, and may receive lucrative fees for these other services; therefore, when recommending CEO pay, the consultant will also have an eye on fees arising from non-CEO pay consulting services.

If these fees are high relative to the fees received for compensation consulting, this creates a conflict of interest.

Set against these conflicts of interest and the repeat business hypothesis is the role of competition in the market for compensation consultants, together with the market for reputation, which ensure that consultants ultimately design pay contracts that are in the interests of shareholders. Therefore, the precise effect of compensation consultants on the level and structure of CEO pay is an open empirical question. There is a growing body of literature on this topic, which is briefly summarised below. The goal of this study is to show how endogenously-chosen compensation consultants influence the level and structure of CEO compensation.

2.2.2 Previous research[6] and hypotheses

Several earlier studies provide evidence that CEO pay levels are higher when firms hire compensation consultants (Armstrong et al., 2012; Murphy & Sandino, 2010). This evidence is consistent with managerial power theory and has drawn public attention to the fact that compensation consultants drive up CEO pay. However, these studies provide mixed results in explaining the causes of this relationship.

On the one hand, Murphy and Sandino (2010) argue that using compensation consultants may lead to higher recommended levels of CEO pay if the consultants face potential conflicts of interest, such as a desire to 'cross-sell' services and secure 'repeat business'. They find supporting evidence in both the US and Canada in 2006. However, contrary to expectations, they find higher CEO pay in US firms when the

[6] Periodic checks for similar studies have been carried out on National Bureau of Economic Research (NBER) and Social Science Research Network (SSRN) data, using keywords such as compensation/remuneration consultant.

consultant works for the board rather than management. This casts doubt on the effect of compensation consultants with conflicts of interest, and has therefore attracted further research interest. Using data on the 235 largest firms ranked by market capitalisation in the UK in 2003, both Conyon (2010) and Conyon, Peck, and Sadler (2011) find that CEO pay is higher when consultants supply other business services to the firm. Conyon, Peck, and Sadler (2011) also show that CEO pay is positively associated with peer firms that have higher interlocking interests between board and consultant. In contrast, using data from 755 firms from the S&P 1500 in 2006, Cadman, Carter, and Hillegeist (2010) find no evidence that consultants with potential conflicts of interest drive up levels of pay or induce lower CEO performance pay sensitivities.

On the other hand, some studies consider the structure of CEO compensation and find that the association is driven largely by a higher proportion of performance-related, equity-based compensation, which is more aligned with optimal contract theory. Using data from 308 S&P 500 US firms in 2006 and 231 UK firms in 2003, Conyon, Peck, and Sadler (2009) find a consistent positive correlation between the proportion of equity in total CEO pay and the presence of a consultant. Voulgaris, Stathopoulos, and Walker (2010) use 500 UK firms from the FTSE 100, 250 and Small Cap Indices in 2006 and find that the positive effect of consultants on CEO pay levels is driven mainly by increases in equity-based compensation.

The previous studies mentioned so far typically use one- or two-year cross-sectional data, enabling them to provide only correlation analysis and potentially leading to a lack of evidence. The main reason is that in the US, the Securities and Exchange Commission (SEC) only requires disclosure of compensation consultants in proxy

statements filed after December 2006. The disclosure requirement in the UK started three years earlier than in the US; therefore, several UK studies started to investigate the dynamic effects of compensation consultants with a short period of panel data. Kabir and Minhat (2014) examine a sample of UK firms from 2003 to 2006 and find that CEOs receive higher equity-based pay when firms employ multiple compensation consultants rather than a single consultant, and that the market shares of compensation consultants are positively related to CEO equity-based pay. They also find that CEO pay increases as the number of compensation consultants increases, but not vice versa. Goh and Gupta's (2010) study of a sample of UK firms from 2002 to 2008 reveals that CEOs receive higher salary increments in the year that firms change their main compensation consultant. They also find that the CEO receives a less risky compensation package, measured by a lower percentage of equity compensation in total CEO pay. They interpret these effects on the growth in compensation as evidence that firms opinion-shop between different consultants in return for more favourable CEO compensation.

However, a puzzle remains as to the precise effect of compensation consultants on CEO pay. Further studies of the effect of compensation consultants with time-series panel data are therefore needed. Murphy and Sandino (2015) were the first to use a longer time series of US data from 2006 to 2011 to explore the extent to which CEO pay affects firms' decisions to hire or fire compensation consultants, and to examine the effects of changes in the use of consultants on changes in the level and structure of pay. They find that firms that start to use consultants have higher *ex ante* CEO pay than firms that do not retain consultants. They also show that the effects of higher levels of pay on future performance are more favourable in firms with consultants than in those without. Chu, Faasse, and Rau (2016) also use a longitudinal dataset of

US firms between 2006 and 2012 and find that firms that start to hire a compensation consultant experience a significant increase in CEO pay compared with a propensity-score-matched sample, indicating that hiring compensation consultants is used to justify higher executive pay. Cai, Kini, and Williams (2016) also use a panel of US firms, from 2006 to 2010, to investigate whether compensation consultants exhibit distinct styles in determining CEO pay and structure. They find that the effects of style only exist when firms have weak governance mechanisms or when consultants face conflicts of interest. They also find that firms with higher salaries or a higher proportion of salary to total compensation show a lower lead return on assets and Tobin's q.

Motivated by the inconclusive body of findings, as well as the US panel studies, this study uses a longer (nine-year) panel of UK FTSE 350 firms from 2003 to 2011 in order to provide additional evidence of the role of compensation consultants. Based on the managerial power view, the following main hypotheses are revisited and tested:

> *Hypothesis 1a: The level of CEO pay is positively related to the presence of compensation consultants.*
>
> *Hypothesis 1b: The percentage of incentive-based pay is non-positively related to the presence of compensation consultants.*

Identification of the consultant effect presents an important empirical challenge, because the choice of hiring a compensation consultant may be endogenous (Armstrong et al., 2012; Conyon, Peck, and Sadler, 2009; Murphy & Sandino, 2010). In other words, companies hiring pay consultants may be different from those that do not. For example, larger firms may be more likely to recruit consultants because of their complexity of operations and demand for managerial talent. In general, this is an omitted variable problem that is due to unobserved and uncontrolled differences

between firms that hire compensation consultants and those that do not. If these are correlated with the presence of compensation consultants, then the estimate derived from the OLS estimator is biased and inconsistent. From an optimal contracting perspective, if compensation consultants provide advice based on firms' characteristics, then the effect of compensation consultants will disappear after controlling for omitted variables. However, from a managerial power perspective, if compensation consultants suggest excessive CEO pay having taken into account firm characteristics, then the effect will persist. Accordingly, it is hypothesised that:

> *Hypothesis 2: There is a positive effect of consultants on CEO pay, after controlling for omitted variable bias and/or selection effects.*

In addition, this study tests whether high-quality governance improves the optimal contracting relationship. The previous literature suggests the importance of governance quality in understanding the role of compensation consultants (Armstrong et al., 2012; Cai et al., 2016). Armstrong et al. (2012) suggest that higher observed pay levels in firms using pay consultants are driven by differences in corporate governance factors. They employ a propensity score-matching approach. In models that are statistically matched only on economic characteristics, they find that CEO pay is still higher in firms that use compensation consultants. However, when controlling for both corporate governance factors and economic variables, they find no significant CEO pay differences between firms using and not using pay consultants. Their results suggest that weak governance explains much of the higher pay in companies that hire consultants. Also, the quality of compensation consultants matters. Cai et al. (2016) find that firms hiring less reputable compensation consultants largely drive the effects of style on a sub-sample of hiring firms with weak governance mechanisms. Taking compensation consultant fees into account, Cho, Hyun, and Shin (2015) find that CEO

pay is positively associated with excessive executive compensation consulting fees, and that this association is driven largely by weakly-governed firms. These studies support the managerial view that the effect of compensation consultants is more likely to be abused in poorly governed firms. Therefore, this study seeks to analyse the role of governance quality directly. Specifically, ASSET4 data are used, and firm-level observations are split based on whether their governance scores are above or below the sample median. This setting enables the following hypothesis to be empirically tested:

> *Hypothesis 3: The positive effects of compensation consultants on CEO pay and incentives are stronger in firms with bad governance.*

2.3 Data and Methods

2.3.1 Data sources and sample

Four separate sources of data were used. CEO characteristics, corporate governance and executive compensation data were derived from BoardEx.[7] The BoardEx database contains biographical information on most board members and senior executives around the world, and these individuals are associated with over 800,000 global organisations. Examples of previous studies that have used BoardEx include Conyon et al. (2013), Fernandes et al. (2013), Ferri and Maber (2013), Piaskowska and Trojanowski (2014) and Meyerinck, Oesch, and Schmid (2016).

[7] BoardEx data are available from http://corp.boardex.com/data/. Fernandes et al. (2013) and Conyon et al. (2013) discuss the strengths and potential weaknesses of using compensation data from BoardEx. The main advantage is the ability to use a long time series of CEO compensation data per firm, which includes a calculation of the expected value of options and other equity that the board allocates to the executive. However, BoardEx values stock options at the end of the year rather than at the grant date. Also, for performance share plans (i.e. value of restricted stock), BoardEx computes the value based on the maximum rather than the target or minimum shares that can be awarded under the plan, multiplied also by the year-end stock price. These introduce potential calculation errors. Nevertheless, Fernandes et al. (2013) compare their results using BoardEx value with ExecuComp value on US CEOs' pay and find that the results are consistent.

Compensation consultant data were derived from Manifest,[8] a UK-based proxy voting agency that provides resources for objective corporate governance research and voting services for institutional investors, governance professionals, academics and professional advisors. Gregory-Smith (2009) replicates six existing studies using Manifest data relating to remuneration committee structure and finds similar results, providing credibility for the Manifest dataset. The high-quality corporate governance data provided by Manifest have been used by many robust studies (Conyon, Peck, & Sadler, 2009; Gregory-Smith, Main, & O'Reilly, 2014; Gregory-Smith, Thompson, & Wright, 2009). In terms of compensation consultant data, Manifest provides the name and the appointment and discharge dates of the consultant for each firm.

Economic variables such as firm revenues, shareholder returns and industrial structure were derived from Datastream,[9] a database of financial and economic research data from Thomson Reuters. Examples of previous literature using Datastream include Dastidar (2009), Goh and Gupta (2010), Nielsen and Nielsen (2013), Voulgaris et al. (2010) and Hawn and Ioannou (2016).

Finally, corporate governance quality data were drawn from Thomson Reuters' ASSET4 database,[10] a leading provider of environmental, social and corporate governance (ESG) data. This gathers extensive, objective, quantitative and qualitative ESG data on 3,100 global companies and scores them from 0 to 100 on four pillars: environmental, social, corporate governance and economic. In the UK, ASSET4 covers the FTSE 250 since the fiscal year 2002. Previous literature using ASSET4

[8] https://www.manifest.co.uk/.
[9] http://thomsonreuters.com/en.html.
[10] http://financial.thomsonreuters.com/en/products/data-analytics/market-data/indices/esg-index.html.

includes Ioannou and Serafeim (2012), Lys, Naughton, and Wang (2015) and Mackenzie, Rees, and Rodionova (2013).

The sample for this study consisted of any firm that had been a constituent member of the FTSE 350 at any time from 2003 to 2011. The unit of analysis was the CEO of each firm for each year. The CEO of each firm was manually identified from BoardEx and Manifest data sources for each year. Investment trusts and similar financial companies were excluded from the analysis. A constituent list of FTSE 350 firms was identified from Datastream at the beginning of each year (January). The final sample consisted of 2,776 firm-year observations, with 455 separate and distinct firms and 763 unique CEOs.

2.3.2 Empirical models

First, to test the effect of compensation consultants on CEO levels and incentives, the following OLS regression model was estimated:

$$y_{i,t} = \alpha + \beta Consultant_{i,t} + \gamma Controls_{i,t} + Industry_t + Year_t + \varepsilon_{i,t} \qquad (1)$$

where y_{it} stands for compensation measures such as 'CEO compensation' and 'CEO pay structure', each measured for the CEO of firm *i* at time *t*. The term $Consultant_{i,t}$ is an indicator variable of the compensation consultant that equals one if the firm used any compensation consultant, and zero otherwise. Importantly, and in contrast to previous studies, the pay consultant measure varies across individual firms *i* and across time *t*. The term β is the population parameter to be estimated and is the effect of pay consultants on CEO compensation. This is the primary coefficient estimate of interest in this study. The $Controls_{i,t}$ matrix contains a set of firm-level economic, corporate governance and CEO-level determinants of executive compensation. The

parameter vector γ is a set of coefficients associated with the control variables. Definitions of the main variables are presented in Appendix A. A set of year time dummies ($Year_t$) was included to capture the effects of macroeconomic shocks, and a set of industry dummies ($Industry_t$) was included to capture inter-industry differences in the demand for executive talent. The error term $\varepsilon_{i,t}$ was assumed to be independent and identically distributed.

A primary concern with previous estimates is that the presence of a compensation consultant may be endogenous. As is well known, this problem may lead to statistical bias and is very difficult to resolve fully. To some extent, the application of firm fixed effects controls for any unobserved, non-time-varying, firm-specific factors that may influence CEO pay and incentives.

The following general panel data econometric model was then estimated:

$$y_{i,t} = \alpha Firm_i + \beta Consultant_{i,t} + \gamma Controls_{i,t} + Year_t + \varepsilon_{i,t} \qquad (2)$$

The term $\alpha Firm_i$ is a set of firm fixed effects. This specification helps to mitigate statistical biases associated with firm-level omitted variables.

As an alternative, CEO fixed effects were also applied in order to control unobservable CEO-specific time-invariant characteristics, using the following model:

$$y_{i,t} = \alpha CEO_i + \beta Consultant_{i,t} + \gamma Controls_{i,t} + Year_t + \varepsilon_{i,t} \qquad (3)$$

The term αCEO_i is a set of CEO fixed effects. This specification helps to mitigate statistical biases associated with CEO-level omitted variables.

To further address the endogenous selection of pay consultants, propensity score methods were used (Angrist & Pischke, 2008; Rosenbaum & Rubin, 1983). The goal of propensity score matching was to find a set of non-consultant control firms that could be matched optimally to the set of firms that had hired consultants (Imbens, 2000). The treatment (consultant) firms and control group (non-consultant) firms were made to be as statistically alike as possible using a matching algorithm. Having done this, it was possible to compare average CEO pay and incentives between the treatment and control groups because they were statistically alike in all other economically-relevant characteristics.

2.3.3 Variable measurements

With regard to CEO pay level, the levels of salary, equity and total compensation were considered. The level of salary is the base annual pay. The level of equity-based pay comprises the sum of shares awarded, the estimated value of options awarded and any long-term incentive plan awarded during the fiscal year. The level of CEO total compensation was measured as the sum of salary, bonus and equity-based pay for the year. CEO incentives are defined in various ways in the literature (Murphy, 1999). In terms of CEO incentives, this study used the proportion of salary and equity in the total compensation.

The term ‘Consultant’ refers to the presence of compensation consultants, which is an indicator variable that equals one if the firm used any compensation consultant, and zero otherwise. This variable is commonly used in the previous literature to examine the effect of compensation consultants (Conyon, Peck, & Sadler, 2009; Voulgaris et al., 2010).

Corporate governance quality focused on two scores. First, the score for general governance quality measured a company's systems and processes that ensured that its board members and executives acted in the best interests of its long-term shareholders. Second, the score for specific compensation policy quality measured a company's management commitment and effectiveness in following best-practice corporate governance principles relating to competitive and proportionate management compensation. Indicator variables were generated, equalling one if the score was above the sample median, and zero otherwise.

In addition to the main explanatory variable, this study also used a set of firm-level economic and corporate governance control variables that have been found to have an effect on CEO compensation (Core, Holthausen, & Larcker, 1999; Murphy, 1985). In terms of firm-specific economic controls, the size of the firm indicates organisational complexity and was proxied by the logarithm of total assets. Firm performance reflects the potential alignment of managers' and shareholders' interests. This was measured by two variables: total shareholder returns captured market-based performance, and return on assets captured accounting-based performance. Firm growth opportunity was measured by the market-to-book ratio. Firm risk was measured by stock volatility, which is the standard deviation of annualised monthly stock returns over the calendar year. Firm risk was included because risk-averse CEOs may require higher compensation for greater risk taking. In terms of corporate governance controls, board characteristics were captured by the logarithm of board size, the logarithm of compensation committee size, CEO–chair duality and non-executive ratio. CEOs' skills and experience were proxied by the logarithms of CEO age and tenure.

2.4 Results

2.4.1 Descriptive statistics

Table 1 provides data on UK executive compensation consultants. The top half of the table shows the market share of the top consultants in 2011, which was chosen as a typical year. Although many compensation consultants supply services to the FTSE 350, the prominent actors in the market are Hewitt New Bridge Street Consulting and Towers Watson, with market shares in excess of 20 per cent. The market shares of these add up to approximately 110 per cent, since each firm may hire more than one consultant.

The bottom half of Table 1 illustrates this point in more detail. Twenty-one companies in the FTSE 350 did not have an external pay consultant in 2011, representing approximately seven per cent of the total. About half of the FTSE 350 had only one compensation consultant. However, as the data show, many companies had two or more consultants. For example, there were 60 firms (21 per cent) with two consultants, and 19 firms (seven per cent) with four or more consultants.

Table 2 provides descriptive statistics pertaining to the main variables used in the study. The average CEO salary compensation was approximately £530,000, and the average CEO total compensation (the sum of salary, bonus, options and other equity pay granted during the year) was approximately £2,060,0000. The median CEO total compensation was around £1,210,000, indicating that the distribution of CEO total compensation was skewed. Therefore, the natural logarithm was used in the empirical analysis.

Table 1: UK compensation consultants

Consultant name	Market share in 2011
Hewitt New Bridge Street Consulting	0.31
Towers Watson	0.23
Monks	0.14
Mercer	0.06
Deloitte	0.17
Kepler	0.14
Hay	0.02
KPMG	0.03

Number of pay consultants	Frequency	Percentage	Cumulative
0	21	7.39	7.39
1	154	54.23	61.62
2	60	21.13	82.75
3	30	10.56	93.31
4 or more	19	6.69	100
Total	**284**	**100**	

Note: This table presents the market share of the main consultants and the distribution of consultants based on 284 FTSE 350 firms in 2011. Source: Manifest, with author's own calculations.

The results reveal that the percentage of total compensation comprising salary was approximately 41 per cent, and the percentage made up of equity-based pay was approximately 40 per cent. These findings accord with previous UK studies, such as Conyon, Peck, and Sadler (2009), which find that CEO salary (the fixed element of total CEO compensation) is less than 50 per cent of total pay. In other words, the guaranteed component of CEO pay is less than the non-guaranteed element. Performance indicators typically drive the non-guaranteed part, providing evidence of significant pay-for-performance in UK CEO compensation contracts.

In terms of the corporate governance variables, compensation consultants were present in about 93 per cent of firms. This result is consistent with Conyon, Peck, and Sadler (2009). The average board had nine members, and the percentage of outsiders on the main board was about 52 per cent. This differs from the US, where the proportion of insiders on boards is much lower. In approximately 16 per cent of cases, the CEO was also the chairperson of the board. Again, this differs from the US, where the CEO is often also the chairman of the board. The average size of compensation committees was approximately four members. This is a sub-set of the main board and is made up of entirely outside directors. In terms of CEO demographics, the typical CEO was approximately 51 years of age, and CEO tenure was approximately five years. Finally, the economic variables show that stock returns were approximately 18 per cent on average, returns on assets were approximately four per cent, stock market volatility was about 31 per cent, the leverage ratio was about 38 per cent, and the market-to-book ratio representing growth opportunities was about 2.6. Each of these seems consistent with other studies that have used UK data (Goh & Gupta, 2010; Kabir & Minhat, 2014).

Table 2: Descriptive statistics

Variable	Number	Mean	Std Dev	Median
Salary	2,776	528.98	388.43	438
Equity-linked compensation	2,776	1,179.65	2,690.02	500
Total compensation	2,776	2,064.81	3,049.15	1,210
Salary %	2,776	0.41	0.24	0.36
Equity %	2,776	0.4	0.25	0.43
Consultant 1/0	2,776	0.93	0.26	1
Top three consultants 1/0	2,776	0.65	0.48	1
Non-top three consultants 1/0	2,776	0.28	0.45	0
Total assets	2,776	20,099.56	120,559.13	1,081.15
Stock returns (one year)	2,776	0.18	0.63	0.14
Return on assets	2,776	0.04	0.13	0.05
Stock volatility	2,776	0.31	0.11	0.29
Leverage	2,776	0.38	0.27	0.35
Market-to-book ratio	2,776	2.57	3.2	1.97
Board size	2,776	9.15	2.59	9
Non-executive ratio	2,776	0.52	0.13	0.5
CEO is Chairman	2,776	0.16	0.37	0
Compensation committee size	2,776	3.82	1.06	4
Age	2,776	51.42	6.34	51
Tenure	2,776	5.4	5.25	3.9
Corporate governance pillar score	1,994	72.32	17.3	75.44
Compensation policy score	1,994	75.19	15.37	79.95

Note: This table presents descriptive statistics for the key variables. Variable definitions are provided in Appendix A. Compensation level and total assets are in 000s of GBP. The corporate governance scores have a lower sample size, as ASSET4 only covers FTSE 250 while the main sample covers FTSE 350.

2.4.2 Regression results

Table 3 investigates the relationship between compensation consultants and CEO pay levels and incentives based on OLS estimation with robust standard errors (Hypotheses 1a and 1b). A set of controls for firm-level economic governance characteristics and CEO characteristics were included. In addition, year and industry dummies were included but are not reported for simplicity.

In terms of CEO pay levels, the results reveal that consultants raised CEO salaries by approximately seven per cent (t=2.34, p=0.02). These positive relationships are also present for both equity compensation and total compensation. The coefficient of equity compensation is around 86 per cent (t=4.37, p=0.00). The estimated coefficient of total compensation is about 14 per cent (t=2.93, p=0.00), which means that CEO pay was 14 per cent higher in firms that hired compensation consultants. Therefore, levels of CEO compensation are positively correlated with the presence of compensation consultants. This confirms Hypothesis 1a and is consistent with previous studies (Conyon, Peck, & Sadler, 2009).

In terms of CEO pay incentives, the presence of compensation consultants is negatively correlated with the salary (non-incentive element) percentage of total pay, with a coefficient of -4.7 per cent (t=-2.43, p=0.02). This is inconsistent with Hypothesis 1b and implies that consultants are more inclined to link CEO compensation contracts to firm performance. Furthermore, the percentage of equity (incentive element) in the CEO compensation contract is positively correlated with the presence of compensation consultants, with a coefficient of 7.8 per cent (t=4.06, p=0.00). This provides direct evidence that consultants recommend compensation contracts that align shareholder and CEO interests.

Table 3: Compensation consultants and CEO pay levels

	Log of Salary (1)	Log of Equity (2)	Log of Total Compensation (3)	Salary % (4)	Equity % (5)
Consultant 1/0	0.072*	0.858***	0.139**	-0.047*	0.078***
	(0.031)	(0.197)	(0.048)	(0.019)	(0.019)
Log of total assets	0.165***	0.369***	0.255***	-0.031***	0.033***
	(0.008)	(0.039)	(0.012)	(0.004)	(0.004)
Stock returns (1 year)	0.010	0.106	0.068*	-0.033***	0.007
	(0.013)	(0.095)	(0.027)	(0.009)	(0.009)
Return on assets	0.140*	1.207**	0.804***	-0.241***	0.094*
	(0.064)	(0.415)	(0.126)	(0.038)	(0.038)
Stock volatility	-0.304***	-3.195***	-0.638***	0.222***	-0.255***
	(0.092)	(0.556)	(0.147)	(0.053)	(0.055)
Leverage	-0.010	0.005	-0.163**	0.038*	0.002
	(0.032)	(0.179)	(0.052)	(0.017)	(0.017)
Market-to-book ratio	0.007**	0.026+	0.014**	-0.001	0.002
	(0.002)	(0.014)	(0.004)	(0.001)	(0.001)
Log of board size	0.213***	1.014***	0.449***	-0.083***	0.066**
	(0.044)	(0.240)	(0.072)	(0.023)	(0.023)
Non-executive ratio	0.568***	1.860***	0.725***	-0.082*	0.135**
	(0.080)	(0.427)	(0.117)	(0.040)	(0.041)
CEO is Chairman	-0.072**	-0.816***	-0.190***	0.050***	-0.053***
	(0.023)	(0.134)	(0.035)	(0.012)	(0.013)
Log comp. comm. size	0.073*	0.577**	0.112*	-0.030+	0.042*
	(0.032)	(0.179)	(0.050)	(0.016)	(0.017)
Log of CEO age	0.027	-1.976***	-0.306**	0.192***	-0.179***
	(0.064)	(0.402)	(0.103)	(0.036)	(0.038)
Log of CEO tenure	0.117***	0.059	0.087***	0.003	-0.012*
	(0.011)	(0.046)	(0.014)	(0.005)	(0.005)
Constant	2.714***	3.907*	3.329***	0.327*	0.403**
	(0.259)	(1.640)	(0.414)	(0.148)	(0.155)
Observations	2,776	2,776	2,776	2,776	2,776
R-squared	0.592	0.294	0.567	0.299	0.222
Industry effects	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes

This table presents regression results for the effect of consultants on CEO pay level. Variable definitions are provided in Appendix A; robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

Importantly, a significant amount of cross-sectional variation is explained by the other variables in the model. In general, CEO compensation level, measured as salary, equity or total compensation, is positively correlated to firm size (total assets), with an estimated elasticity in the range of 16.5 to 36.9 per cent. This is highly consistent with other CEO compensation studies, and shows that firm size, reflecting managerial talent, is an important driver of CEO compensation (Murphy, 1999). CEO compensation is also positively correlated with firm performance. In the models used for this study, CEO compensation is positively related to firms' stock returns and returns on assets. This is a general finding and accords with previous studies that find a positive correlation between current levels of CEO compensation and the performance of their firms. There is also some evidence that CEO compensation is negatively correlated with firms' stock price volatility, as well as with corporate leverage, and positively related to growth opportunities, as measured by market-to-book ratio. In terms of CEO incentives, firm size is positively correlated with the percentage of equity-based pay. The negative correlation between firm size and salary percentage is also evidence of an alignment between CEO and shareholder interests. Consistent with standard agency theory, CEO incentives are found to be negatively correlated with stock price volatility. Under more risky and uncertain environments, boards, compensation committees and compensation consultants set fewer incentives for CEOs.

Turning to the corporate governance variables, their joint inclusion is found to be highly significant. CEO compensation levels are positively correlated with the size and percentage of outsiders on boards of directors. Interestingly, when the CEO is also the chairman of the board, total compensation is lower than when the CEO is not the chairman. *Ex ante*, it might have been expected that the greater complexity of running

a firm when the CEO is also the chairman would mean higher levels of CEO pay. Nevertheless, this result is consistent with Kabir and Minhat (2014). In terms of demographics, CEO age is negatively correlated with compensation, whereas CEO tenure is positively correlated. In terms of CEO incentives, similar patterns to CEO compensation levels are found, except for CEO age and tenure; both CEO age and tenure are negatively correlated with the percentage of equity-based pay.

Table 4 Panels A and B present regression estimations for CEO pay levels and incentives using firm and CEO fixed effects respectively to control for any unobserved but fixed heterogeneity across firms. Both panels show that, once fixed effects are included, the effects of consultants on CEO compensation levels and incentives disappear. This is inconsistent with Hypothesis 2 and suggests that consultants are an efficient contracting institution. These results, which are the first to show the effect of consultants in a UK panel-data setting controlling for heterogeneity in firm or CEO quality, point to nuanced effects of compensation consultants on CEO compensation. In OLS settings with industry and year dummies, the evidence points to fairly robust positive consultant effects on CEO pay, but these are sensitive to the control of firm and CEO fixed effects because, in part, the consultant variable captures these time-invariant unobservable differences.

Firm- and CEO-level fixed effects to some extent control for omitted variables bias, because they filter out the permanent yet unobserved effects of a variable. An alternative solution is to use a propensity score-matching approach, as described earlier, in order to isolate the statistically causal effect of pay consultants on executive pay. Propensity score matching proceeds in two steps. In the first step, a probit model is estimated to determine the propensity score.

Table 4: Fixed effect regression results on CEO pay levels and incentives

Panel A: Firm fixed effects results

	Log of Salary	Log of Equity	Log of Total Compensation	Salary %	Equity %
	(1)	(2)	(3)	(4)	(5)
Consultant 1/0	0.001	-0.039	0.073	-0.028	-0.005
	(0.040)	(0.253)	(0.060)	(0.022)	(0.026)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,776	2,776	2,776	2,776	2,776
R-squared	0.448	0.084	0.285	0.202	0.069
Year effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
No. of firms	455	455	455	455	455

Panel B: CEO fixed effects results

	Log of Salary	Log of Equity	Log of Total Compensation	Salary %	Equity %
	(1)	(2)	(3)	(4)	(5)
Consultant 1/0	-0.047	-0.058	0.081	-0.039	0.004
	(0.047)	(0.281)	(0.070)	(0.026)	(0.028)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,776	2,776	2,776	2,776	2,776
R-squared	0.457	0.046	0.305	0.103	0.101
Year effects	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes
No. of CEOs	763	763	763	763	763

Note: This table presents regression results for the effect of consultants on CEO pay and incentives. Panel A presents firm fixed effect regression results and Panel B presents CEO fixed effect regression results. Variable definitions are provided in Appendix A; robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

Table 5 presents estimates of determinants of the presence of a compensation consultant. Column 1 includes compensation, economic and CEO characteristics, and Column 2 also includes governance characteristics.

In terms of firm characteristics, the results show that the presence of a consultant is statistically correlated with firm size, stock return and market-to-book ratio. Firms with higher total assets, lower prior performance and higher growth opportunities are more likely to choose to use a consultant. In terms of compensation characteristics, the percentage of equity pay is positively correlated with the likelihood of using a consultant, whereas total wealth is negatively correlated. This is consistent with Chu et al. (2016). Furthermore, total compensation is positively correlated with the likelihood of using a consultant, which indicates that firms that already had higher total compensation tended to hire consultants, rather than the public perception that consultants drive up CEO total compensation. Most of the statistical and economical effects dampen when controlling the corporate governance variables, suggesting that it is important to consider corporate governance in CEO pay equations to identify the impact of consultants on CEO pay. Specifically, the results show that firms with larger compensation committees were more likely to choose a pay consultant. Challenges to identifying predictors of the presence of a compensation consultant have been identified in previous studies using US data (Murphy & Sandino, 2010). Nevertheless, the results of this study raise a concern that the use of consultants is endogenous; therefore, propensity score methods were applied to mitigate such selection effects.

Table 5: Determinants of the presence of compensation consultants

	Consultant 1/0	
	(1)	**(2)**
Log of total compensation (t-1)	0.197*	0.161+
	(0.091)	(0.094)
Log of total wealth (t-1)	-0.096**	-0.083*
	(0.034)	(0.034)
Equity % (t-1)	0.636**	0.529*
	(0.238)	(0.242)
Log of total assets (t-1)	0.086*	0.069
	(0.038)	(0.043)
Stock returns (1 year) (t-1)	-0.174**	-0.178**
	(0.060)	(0.061)
Return on assets (t-1)	-0.253	-0.297
	(0.346)	(0.353)
Market-to-book value (t-1)	0.041*	0.039*
	(0.016)	(0.017)
Log of CEO age (t-1)	-0.279	-0.247
	(0.349)	(0.357)
Log of CEO tenure (t-1)	0.031	0.028
	(0.047)	(0.049)
Log of board size (t-1)		-0.149
		(0.222)
Non-executive ratio (t-1)		0.070
		(0.423)
CEO is Chairman (t-1)		-0.277*
		(0.110)
Log of comp. comm. size (t-1)		0.800***
		(0.193)
Constant	0.650	0.384
	(1.430)	(1.457)
Observations	2,280	2,280
Pseudo R-squared	0.128	0.156
Industry effects	Yes	Yes
Year effects	Yes	Yes

Note: This table presents probit regression results for determinants of the presence of compensation consultants. Variable definitions are provided in Appendix A; probit models are estimated using maximum likelihood; robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

The purpose of propensity score matching was to match firms without a consultant (control group) optimally with firms that used a consultant (treatment group). In the second step, the average treatment effects of the treated (ATT) on CEO compensation levels and incentives were compared between the consultant and non-consultant samples. This matching was based on the model results shown in Column 2 of Table 5, which include compensation, firm, CEO and corporate governance characteristics. Like-for-like firms were matched using a nearest neighbour algorithm with a caliper width of 0.01 and no replacement.[11]

Table 6 presents the treatment effect of compensation consultants on compensation levels and incentives. In general, after controlling for selection effects, compensation consultants are found to have negligible impacts on compensation levels and incentives. For example, with regard to total compensation, in the unmatched sample the difference between the treated group (i.e. compensation consultants) and the control group (i.e. firms without consultants) is approximately 46 per cent. As indicated by the t-statistic (6.13), CEOs of firms with consultants received statistically higher compensation than those without consultants. However, in the matched sample, the difference is no longer statistically significant. Hence, it can be concluded that consultants have no causal effect on the level of CEO total compensation. Similar conclusions can be drawn for levels of salary and equity, as well as the percentages of salary and equity in total compensation.

[11] It is preferable not to use replacement, as the observations are not independent when matched with replacement (Peel & Makepeace, 2012). However, given that the majority of firms hired compensation consultants, many more observations were obtained in common support when matching with replacement. Nevertheless, the results remained unchanged with and without replacement.

Table 6: Treatment effect of compensation consultants on CEO pay levels and incentives

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Log of salary	Unmatched	6.16	5.83	0.33	0.05	6.64
	ATT	5.87	5.86	0.00	0.07	0.05
Log of equity	Unmatched	5.74	4.27	1.47	0.21	7.15
	ATT	4.40	4.26	0.14	0.33	0.41
Log of total compensation	Unmatched	7.26	6.80	0.46	0.08	6.13
	ATT	6.78	6.81	-0.04	0.10	-0.36
Salary %	Unmatched	0.40	0.47	-0.07	0.02	-3.78
	ATT	0.47	0.48	0.00	0.03	-0.16
Equity %	Unmatched	0.42	0.30	0.12	0.02	6.03
	ATT	0.32	0.29	0.03	0.03	0.93

Note: This table presents the results of propensity score matching on CEO pay levels and incentives. Treated = 152; nearest neighbour algorithm with caliper 0.01, no replacement and observations restricted to common support.

Overall, the results shown in Table 6 lead to the conclusion that observed differences in compensation and incentives between firms that use consultants and those that do not are driven largely by selection effects, rather than by the presence of consultants alone. This suggests that previous studies that have isolated a positive consultant effect on compensation levels and incentives may have done so because of selection issues between treatment and control groups, rather than the pure effect of the pay consultant. Indeed, this is consistent with the previous finding of this study that, after controlling for firm fixed effects, there is a much more muted compensation consultant effect on CEO pay and incentives.

Table 7 investigates the effects of compensation consultants on CEO pay and incentives, using different sub-samples (Hypothesis 3) based on the quality of corporate governance arrangements. Panel A investigates sub-samples using ASSET4 scores for general governance quality, while Panel B investigates sub-samples using ASSET4 scores specifically for compensation policy quality. Both panels show that the effects of compensation consultants are different in firms with good and bad governance and compensation policy quality, indicating that it is important for future studies to take account of heterogeneous governance quality to understand the effect of compensation consultants on CEO pay.

To elaborate, Panel A shows that the effect of consultants on total compensation was larger in well-governed firms than in poorly governed firms (difference: t=2.00, p=0.05). Again, this suggests that well-governed firms that pay higher compensation are more likely to choose to hire compensation consultants. Panel B shows that the effect of compensation consultants on CEO pay was driven by their impact on firms with poor compensation policies. Although the presence of compensation consultants

had a stronger effect on total compensation (difference: t=2.32, p=0.02), in firms with poor compensation policies, the percentage of equity-based pay was also higher when firms hired consultants (difference: t=2.96, p=0.00).

The results provide no evidence that entrenched CEOs use compensation consultants to gain higher pay, even in firms with poor governance or compensation policies. In non-tabulated results for the firm fixed effect regression models, no relationship was found between compensation consultants and CEO pay levels and incentives in either the 'good' or 'bad' governance or compensation policy firms. In summary, the contingent and available empirical results provide general support for the claim that compensation consultants design efficient pay contracts in the interests of shareholders. There is less evidence to support managerial power claims.

Table 7: Sub-sample analysis of corporate governance quality and compensation policy quality

	n	Log Salary	Log Equity	Log Total Compensation	Salary %	Equity %
		(1)	(2)	(3)	(4)	(5)
Panel A: Corporate Governance Quality						
High governance quality	997	-0.024	0.506	0.267**	-0.084*	0.080*
		(0.063)	(0.373)	(0.093)	(0.036)	(0.039)
Low governance quality	997	-0.017	1.084**	0.009	-0.049	0.111***
		(0.059)	(0.333)	(0.089)	(0.033)	(0.030)
Difference		-0.007	-0.578	0.258*	-0.035	-0.031
		(0.087)	(0.500)	(0.129)	(0.049)	(0.049)
Panel B: Compensation Policy Quality						
High compensation policy quality	996	-0.022	-0.016	-0.103	0.015	0.024
		(0.065)	(0.304)	(0.111)	(0.031)	(0.034)
Low compensation policy quality	998	-0.024	1.515***	0.214**	-0.109***	0.157***
		(0.063)	(0.329)	(0.079)	(0.033)	(0.029)
Difference		0.002	-1.531***	-0.317*	0.125**	-0.133**
		(0.090)	(0.448)	(0.137)	(0.045)	(0.045)
Controls		Yes	Yes	Yes	Yes	Yes
Industry effects		Yes	Yes	Yes	Yes	Yes
Year effects		Yes	Yes	Yes	Yes	Yes

Note: This table presents OLS regression results for the effect of consultants on CEO pay levels and incentives in different sub-samples. A set of firm-specific economic and CEO characteristics and corporate governance controls are included but not reported for simplicity. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

2.5 Further Analysis

Further analysis was conducted in the form of additional tests and sensitivity checks on the main findings.

2.5.1 Pay performance sensitivity

The effect of compensation consultants on pay performance sensitivity (PPS) was tested to examine whether the compensation contract suggested by consultants was associated with firms' performance, measured by return on assets (ROA). From the managerial power view, if the consultants suggested favourable compensation packages which helped managers to extract wealth from shareholders, the presence of compensation consultants would be expected to be negatively associated with PPS. Table 8 shows the results. A persistent positive coefficient is found for the interaction 'Consultant 1/0* Return on Asset' in OLS, firm and CEO fixed-effects regressions. Compared with the effect on level of equity, the statistical significance of the effect on total compensation is rather marginal. Collectively, the results show that firms with consultants compensate their CEOs with higher PPS than firms without consultants, which is inconsistent with the managerial power view.

Table 8: Compensation consultants and CEO pay performance sensitivity

	OLS		Firm Fixed Effect		CEO Fixed Effect	
	Log of Equity	Log of Total Compensation	Log of Equity	Log of Total Compensation	Log of Equity	Log of Total Compensation
	(1)	(2)	(3)	(4)	(5)	(6)
Consultant 1/0	0.679**	0.123*	-0.260	0.027	-0.291	0.034
	(0.221)	(0.052)	(0.268)	(0.067)	(0.292)	(0.073)
Return on assets	-2.441	0.302	0.133+	0.094***	0.073	0.069***
	(1.911)	(0.491)	(0.075)	(0.019)	(0.074)	(0.018)
Consultant 1/0 * Return on assets	3.851*	0.556	4.101*	0.629	4.412**	0.891*
	(1.942)	(0.501)	(1.639)	(0.409)	(1.574)	(0.391)
Observations	2776	2776	2776	2776	2776	2776
R-squared	0.296	0.570	0.086	0.320	0.049	0.307
Observations	2776	2776	2776	2776	2776	2776
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	No	No	No	No
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes	No	No
CEO fixed effects	No	No	No	No	Yes	Yes

Note: This table presents regression results for the effect of consultants on CEO pay performance sensitivity. A set of firm-specific economic and CEO characteristics and corporate governance controls are included but not reported for simplicity. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

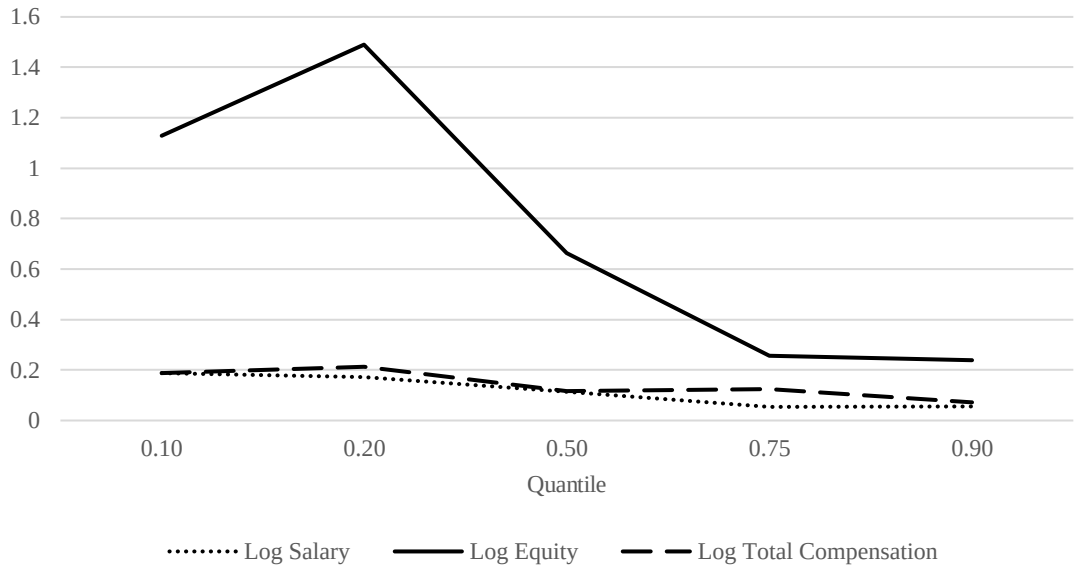
2.5.2 Quantile regressions

Quantile regressions were applied to test whether the effect of compensation consultants was different at different quantiles of CEO pay. The use of quantile regressions is especially important because it allows a family of conditional quantile regression functions to be estimated. This is different from the standard classical linear regression model, where the independent variable of interest (the compensation consultant) predicts the conditional average of the outcome variable (CEO compensation measures). The quantile regression framework allows the provision of a much richer description of the relationship between CEO pay and compensation consultants.[12]

Motivated by Rees and Rodionova (2015), it was assumed that the relationship found between compensation consultants and CEO pay might be due to compensation consultants having a direct influence on CEO pay, or firms with certain pay levels being more likely to hire compensation consultants. Figure 4 provides no evidence that the impact of pay consultants on CEO incentive-based pay was stronger for conditionally high or low compensation levels. Relatively stable trends are found, with a slightly decreasing effect of compensation consultants on levels of salary and total compensation. This is inconsistent with the view that firms in high pay percentiles use compensation consultants to justify their higher pay. The results reveal that the effect of compensation consultants on equity pay is more salient in firms with low to medium equity pay percentiles, indicating that firms with lower equity-based pay are more likely to benefit from hiring compensation consultants to design contracts that better align the interests of managers and shareholders.

[12] Further information on quantile regression is available from Koenker and Hallock (2001).

Figure 4: Quantile analysis of the effect of compensation consultants on CEO pay level



Note: This figure presents quantile analysis of the effect of compensation consultants on CEO pay. The horizontal scale represents quantiles of the dependent variables and the vertical scale represents the estimated coefficient for compensation consultants for each quantile.

2.5.3 Starting and stopping the use of compensation consultants

A general concern is that the presence of compensation consultants may be 'sticky' over time. A firm that hires compensation consultants will probably also have compensation consultants in the following year. To alleviate this concern, tests were conducted to establish whether the first year that a firm started or stopped using compensation consultants would affect changes in CEO pay. Tables 3 to 6 were re-estimated, using changes in values rather than absolute values for the variables. The test variables for OLS, firm and CEO fixed-effect regressions were firms that started to use compensation consultants, firms that stopped using compensation consultants and firms that kept using compensation consultants, and the control group was firms that did not use compensation consultants. In propensity score matching, separate tests were conducted for the effect of firms that started to use compensation consultants and firms that stopped using compensation consultants. In non-tabulated results, no significant relationships were noted, indicating no significant change in CEO pay after a firm started or stopped using compensation consultants. This further supports the main result that compensation consultants do not have a significant effect on CEO pay.

2.5.4 Styles of compensation consultants

In addition to firms' decisions on whether or not to hire a compensation consultant, the study investigated whether the choice of different compensation consultants had an impact on CEO pay.

First, a test was conducted to establish whether the effect of compensation consultants was attributable to the presence of large consultancy firms. The presence of consultants was split into 'top three' consultants and non-top three consultants, and Tables 3 to 5 were re-estimated. In non-tabulated results, top three and non-top three

consultants were found to have similar effects on CEO compensation, suggesting that there was no distinction between large consultants and other types. The results remained qualitatively similar when top four or top five consultants were used.

Second, compensation consultant fixed effects were explored by including consultant dummies. This was carried out to investigate whether the presence of specific individual consultants would help explain variation in CEO compensation, and whether different consultants had different motives and styles. Non-tabulated results revealed no clear or distinct pattern of results for any of the consultants. This is interpreted as meaning that individual consultants do not have heterogeneous effects on CEO compensation levels and incentives.

2.5.5 Determinants of changes in compensation consultants

The panel data enabled examination of whether the previous year's CEO pay level and structure influenced changes in compensation consultants. The purpose was twofold. First, the panel data were used to determine whether consultants who proposed high compensation were more likely to obtain repeat business. Second, the data allowed examination of whether CEOs with previously less favourable compensation packages were more likely to switch or increase their number of compensation consultants and shop for consultants' opinions. Specifically, analysis was undertaken to identify whether firms changed their consultants by increasing or decreasing the number of consultants retained, by changing from a single to several consultants or vice versa, or

by switching the main consultant.[13] Table 5 Column 2 was re-estimated with these changes as dependent variables. The test variables were the previous year's total compensation, total wealth and percentage of equity-based pay. Non-tabulated results provided no evidence that the previous year's compensation level and structure influenced changes in compensation consultants. Further investigation was undertaken to determine whether companies that changed CEO were also more likely to change consultants during these periods, but there was no evidence that CEO turnover was correlated with any change at all in compensation consultants. The results together are inconsistent with hypotheses regarding firms' opinion-shopping or consultants' seeking repeat business.

2.5.6 Robustness checks

To check for robustness, the first step was to establish whether changes in market environment influenced the effect of compensation consultants on CEO compensation levels and incentives. With regard to the effect of the financial crisis (2007-2008), although including year dummies in the regressions controlled to some extent for the effects of macroeconomic shocks, several tests were conducted to ensure the robustness of the main results (i.e. Tables 3 and 4). The regressions were re-estimated, dropping periods from 2007 to 2008; the sample was divided into before (2003-2006) and after (2007-2011) the crisis period and regressions re-estimated for each period; and interactions between the financial crisis period (2007-2008) and the presence of consultants were included. The main results held for all three tests, indicating that the

[13] Within the 2,418 total firm-year observations for changes of compensation consultants, 226 firm-years increased numbers of consultants, 258 firm-years decreased numbers of consultants, 81 firm-years changed from single to multiple consultants, 148 firm-years changed from multiple to single consultants, and 312 firm-years changed main consultant.

financial crisis had no effect on the impact of consultants. With regard to the potential effect of mergers, specifically because some compensation consultants in the dataset merged towards the end of the sample period (Conyon, Peck, & Sadler, 2009),[14] an investigation was undertaken to determine whether this change in the supply structure of compensation consultants affected the main results. In general, it did not. Taken together, the results were robust when the effects of the financial crisis and consultant mergers were taken into account.

The second step in robustness checking was to test whether CEO turnover affected firms' choice of compensation consultants and the impact of compensation consultants on CEO compensation levels and incentives. CEO turnover is an important strategic event which provides not only an opportunity to change the top management team, but also to change other institutional practices. In order to recruit, retain and motivate a new CEO, it might be expected that a change in CEO would be correlated with a change in the number of consultants and/or a change in the main consultant used. No evidence was found to suggest that CEO turnover was correlated with changes in compensation consultants, confirming the previous results.

The third step was to use other measures, such as sales revenue and market capitalisation, rather than total assets as proxies for firm size. Once again, the main results were supported. Therefore, overall, the main results were robust to these additional tests.

[14] Hewitt Associates acquired New Bridge Street Consultants LLP (previously Advisor) on 18 March 2008 to form Hewitt New Bridge Street; Towers Perrin merged with Watson Wyatt in 2009 (announced on 28 June 2009, completed on 4 January 2010) to form Towers Watson, creating the world's largest employee-benefits consulting firm.

2.6 Conclusions

This study investigated the effect of compensation consultants on CEO pay levels and incentives, using a panel of FTSE 350 UK firms from 2003 to 2011. The findings are important as they provide further evidence of the effect of compensation consultants on CEO pay.

The following empirical results were found. First, the cross-sectional findings show that CEO pay is positively correlated with the presence of compensation consultants. The percentage of equity-based pay is also higher in firms that use compensation consultants, consistent with shareholder–management alignment.

Second, these results are not robust to firm or CEO fixed effects or the endogenous selection of compensation consultants. The effect of compensation consultants on the level of CEO pay and structure of CEO incentives disappears after controlling for firm- and CEO-level fixed effects. In addition, the ATT consultant on CEO pay and incentives is zero. There is no econometric evidence that consultants raise CEO compensation levels after taking into account endogenous selection of consultants and/or firm-level fixed effects. Therefore, the evidence does not support the claim of the managerial power model that consultants raise CEO pay or tilt compensation contracts in favour of entrenched CEOs at the expense of shareholders.

Third, there is no evidence that pay consultants are used to increase total CEO pay or alter executive incentives inappropriately in firms with weak corporate governance arrangements. In general, the conditional available evidence rules out the managerial power model, making the optimal contracting explanation of CEO pay and consultants more plausible.

Critics of compensation consultants claim that they are part of the agency problem, rather than a solution to it. Generally, the findings of this study reveal that the effect of consultants can be largely explained by time-invariant firm-level economic and governance characteristics, time-invariant CEO-level characteristics and endogenous selection effects. Previously reported positive correlations between CEO compensation consultants may be interpreted as a signal of firms' corporate governance quality.

The results suggest that compensation consultants exert less influence on CEO compensation than expected. This has two implications. First, given that it is costly for firms to report compensation consultant information, the results raise the question of whether the benefits of disclosure outweigh the costs. Second, the results suggest a need for future research focusing on alternative explanatory factors for CEO pay rises.

3. Foreign Experience and CEO Compensation[15]

Chapter 2 focused on compensation consultants as a key corporate governance institution determining CEO compensation. This chapter focuses on CEOs' foreign experience as a key CEO characteristic that determines CEO compensation. Given the increased globalisation of firms and labour markets, CEOs with foreign experience are a valuable resource for firms, vital for competing in international markets. However, the private benefit to CEOs themselves of possessing such foreign experience has not been fully investigated. This chapter provides empirical evidence that CEOs' foreign experience is valuable to CEOs themselves, and explores potential reasons for this. The key research question addressed is whether CEOs with foreign experience enjoy higher compensation associated with valuable human and social capital. This is confirmed to be generally true.

3.1 Introduction

This study investigates the relationship between CEO foreign experience and total compensation. Globalisation is having a profound effect on product and labour markets, and increasingly on CEO labour markets (Carpenter, Sanders, & Gregersen, 2000; Osawa & Wong, 2015). Some are of the view that it is important to recruit international CEOs, as they have valuable foreign knowledge and access to networks that increase firms' competitive advantage in the global market. This, in turn, increases the CEOs' market value. However, critics of this view argue that CEOs' general managerial ability is more important than foreign experience, and that international complexity can be managed through regional managers or local

[15] This chapter is co-authored with Martin Conyon, Lars Helge Hass and Skralan Vergauwe. The intention is to develop the chapter into a paper for submission to a journal.

consultants. It is therefore interesting to investigate whether CEOs earn a premium if they are foreigners or have significant foreign experience, relative to their domestic counterparts.

There are two relevant streams of literature. First, the stream of literature on CEO characteristics pays considerable attention to how CEOs' foreign experience affects organisational behaviour and outcomes, while neglecting the potential private benefits to the CEOs themselves (Nielsen & Nielsen, 2013; Piaskowska & Trojanowski, 2014; Schmid & Dauth, 2014). Second, the literature on international CEO pay focuses on comparing CEO pay across countries, but overlooks the potential influence of CEOs' prior experience in foreign countries on CEO pay (Conyon et al., 2013; Conyon, Peck, & Sadler, 2009; Fernandes et al., 2013). This study seeks to fill these gaps in the literature.

This study combines upper echelons theory (Hambrick & Mason, 1984, 2007) and resource dependence theory (Salancik & Pfeffer, 1978). It is hypothesised that firms that hire seasoned international CEOs are inclined to engage in foreign markets, and that CEOs with foreign experience provide their firms with a competitive advantage by providing them with both social capital (i.e. foreign networks) and human capital (i.e. foreign knowledge). Foreign experience is rare and valuable, as it is both non-substitutable and non-inimitable. The trend for globalisation also suggests that demand for CEOs with foreign experience will continue to increase, placing upward pressure on CEOs' compensation. Firms seeking to hire CEOs with such foreign experience are therefore willing to offer a compensation premium. Firms' levels of internationalisation may also affect CEOs' total compensation, because CEOs' foreign experience is more important and better realised in firms with higher levels of

international dependence. Therefore, it is likely that CEOs' foreign experience will be positively associated with total CEO compensation, and that the effect of CEOs' foreign experience will be stronger as firms' level of internationalisation increases.

To test the research hypotheses, a sample of UK firms was constructed, comprising firms in the FTSE 350 index between 2003 and 2011.[16] The UK was an ideal research context for this study, as UK firms have a higher proportion of foreign CEOs (around 20 per cent), with more diverse nationalities than other countries,[17] providing ample sample variation to test the hypotheses. In addition, the level of disclosure requirements in relation to executive compensation practices is higher in the UK than in other European countries and comparable to the high standards pertaining to the US market (Vander Bauwhede & Willekens, 2008). Therefore, the UK provided the necessary high-quality CEO compensation data. Furthermore, in terms of global orientation, the UK holds the top position among EU countries for both out-bound acquirers and in-bound target markets, second only to the US worldwide (Allen & Overy, 2015). The sample thus provided sufficient observations, as well as maximised the potential implications of the study. Last but not the least, the research design focused on a single country in order to avoid the correlated omitted variable problems of multi-country studies, involving legal, regulatory, political, cultural and economic factors.

[16] The final sample consisted of 329 unique firms, 508 unique CEOs and 1,834 firm years. Data were obtained from three separate sources: BoardEx, Datastream, and Thomson's SDC Platinum. The study focuses on three particular variables capturing CEOs' foreign experience: foreign nationality, international education and foreign working experience.

[17] For example, 0.4 per cent of directors were of foreign nationality in China between 1999 and 2009 (Giannetti, Liao, and Yu, 2015), whereas 8.3 per cent of directors were from outside Nordic countries in 2008 (Oxelheim et al., 2013). In comparison, the average proportions of foreign CEOs in the US, France and Germany for the same sample period from 2003 to 2011, calculated from BoardEx data, were two per cent, six per cent and 10 per cent respectively. In addition, foreign CEOs in China were manually identified for this study, based on data from CSMAR, revealing an average of 0.5 per cent.

This study produces new and significant findings in the areas of strategy and international business. First, it documents that foreign CEOs earn significantly higher total compensation than domestic CEOs. The magnitude of this effect is large and significant. Estimates suggest an average foreign CEO pay premium of about 35 per cent (t=6.351, p=0.000) after controlling for other firm-level and corporate governance factors. The findings also reveal that national CEOs with foreign working experience earn significantly higher total compensation than other domestic CEOs. Again, the magnitude of the effect is both large and significant. The estimates suggest an average pay premium of about 26 per cent (t=8.062, p=0.000) after controlling for other economic and governance factors. However, there is no evidence that national CEOs with foreign education (as distinct from foreign working experience) earn significantly different pay from other CEOs. The broad findings of this study are consistent with the presumption that foreign CEOs possess detailed knowledge of the region from which they originate (i.e. human capital) and that national CEOs with foreign working experience possess useful networks of local contacts, personal networks with managers in foreign firms and internal advice networks (i.e. social capital). Neither of these can easily be obtained through foreign education alone.

Second, the study documents that the relationship between CEOs' foreign experience and total compensation is stronger when a firm's level of internationalisation is higher, as measured by its percentage of foreign sales. This provides important information about the mechanism for foreign CEOs' pay premiums. Specifically, the rewards for foreign status or foreign working experience are higher in contexts where firms have high degrees of international exposure, presumably because they find the CEOs' foreign knowledge and networks particularly valuable.

The main empirical results are robust to alternative estimation methods. The initial results were isolated using panel data methods, controlling for firm and corporate governance characteristics. However, recognising that the selection of international CEOs[18] may be endogenous, propensity score-matching methods were used to ensure that firms hiring international CEOs were statistically similar to firms hiring domestic CEOs. The propensity score-matching algorithm provides a contemporary approach to address such endogeneity challenges. The results reveal that the average treatment effect of foreign experience is approximately 23 per cent and is statistically significant, with a t-statistic of 4.09. Overall, empirical analysis of the UK data unambiguously points to pay premiums for CEOs' foreign-experience.

Third, the study reveals that CEOs' foreign experience has a positive impact on firms' levels of internationalisation, and that firms are more likely to expand into regions where the CEOs obtained their foreign experience. In addition, CEOs with foreign working experience moderate the negative impact of cultural differences between acquirer and target countries during foreign acquisitions. The results suggest that foreign pay premiums are partly attributable to CEOs' specialist foreign expertise, rather than broader general managerial skills.

Therefore, this study makes several important contributions to a growing literature on the impact and relevance of CEO characteristics. First, the research sheds light on the economic value of foreign experience to the CEO, as measured by the CEO compensation premium. The study builds on the international business literature that focuses on the value of CEOs' foreign experience from the firm's perspective, and

[18] International CEO is an indicator variable that equals one if the CEO has any type of foreign experience, including foreign national, foreign education and/or foreign working experience.

advances scholarly knowledge by showing the significant value of foreign experience from the CEO's perspective. Second, the study contributes to the debate on whether generalist or specialist CEO skills are more valuable to the CEO. While previous studies indicate that general skills are more important, the results of this study suggest that the pay premium depends on CEOs' foreign experience that generates specific foreign expertise and networks. Third, this study is believed to be the first to provide detailed analysis of different types of CEO foreign experience, ranging from foreign nationality to foreign education.

The remainder of this chapter is organised as follows. Section 3.2 provides an overview of relevant theories and presents the hypotheses; Section 3.3 describes the sample, methodology and variables; Section 3.4 presents the empirical results; and Section 3.5 concludes the study.

3.2 Theory, Literature Review[19] and Hypothesis Development

3.2.1 Foreign experience and CEO compensation

Research on top managers has increased dramatically since Bertrand and Schoar's (2003) influential econometric study showed that top managers have a statistically significant effect on corporate behaviour. However, the strategic management literature has long recognised the importance of top managers in value creation. In a pioneering study, Dearborn and Simon (1958) concluded that managers with different functional backgrounds vary in their attitudes, knowledge and perspectives, leading to different strategic decisions. Building on Dearborn and Simon (1958)'s study,

[19] Periodic checks for similar studies have been carried out on National Bureau of Economic Research (NBER) and Social Science Research Network (SSRN) data, using keywords such as CEO/executive compensation and foreign experience.

Hambrick and Mason (1984, 2007) developed upper echelons theory, which posits that the organisation is a reflection of its top managers. They emphasise the importance of considering characteristics of an organisation's top managers (e.g. age, education, functional background, personality and other experience) to understand its behaviour. Accordingly, observable demographic characteristics of top managers serve as valid predictors of firms' strategies.

International experience is a key characteristic of top managers, which influences their ability and preference in making decisions. In terms of firm performance, using US Fortune 500 firms, Carpenter, Sanders, and Gregersen (2001) and Daily, Certo, and Dalton (2000) show that firms with international CEOs have better financial performance. In terms of strategic decisions, Herrmann and Datta (2005) show that managers with international experience perceive lower risk associated with foreign expansion than managers from different backgrounds and with different levels of experience, and are therefore more likely to engage in foreign direct investments. These results are confirmed by Nielsen and Nielsen (2011) and Piaskowska and Trojanowski (2014).

However, although upper echelons theory points out the importance of top managers and their background, it does not pinpoint where and how their background translates into driving firms' competitive advantage (Schmid & Dauth, 2014) and influencing managers' total pay.

Given the importance of the resource-based view (RBV) and the neglect of governance–RBV interactions in the previous literature (Lockett & Thompson, 2001), this study combines upper echelons theory with resource dependence theory. Resource dependence theory asserts that organisations are comprised of bundles of unique

resources that ultimately affect their behaviour and strategy (Salancik & Pfeffer, 1978). In the context of international strategic decisions, top managers with international experience are vital in connecting firms to international markets, as they possess valuable social and human capital. In terms of social capital, international experience enables managers to build useful networks of local contacts (Blomstermo et al., 2004), personal networks with managers in foreign firms (Useem, 1984), and internal advice networks (Athanassiou & Nigh, 2005). The previous literature suggests that valuable network capital increases executives' bargaining power in the labour market, and that this is reflected in executive compensation (Brown et al., 2012; Engelberg, Gao, & Parsons, 2013; Geletkanycz, Boyd, & Finkelstein, 2011). In terms of human capital, international experience develops global mindsets in top managers, enabling them to engage in global operations (Piaskowska & Trojanowski, 2014; Sambharya, 1996). In particular, foreign CEOs have detailed knowledge of the region from which they originate, including economic and market factors as well as institutions such as culture and norms (Nielsen & Nielsen, 2010). CEOs' foreign experience is valuable as it is both non-substitutable and inimitable (Carpenter, Sanders, & Gregersen, 2001; Daily, Certo, & Dalton, 2000): it is non-substitutable as it provides CEOs with skills that are not easily substituted through other channels (Sambharya, 1996; Sullivan, 1994) and is inimitable as it is a function of unique historical conditions (Barney, 1991). All of these factors create competitive advantage for focal firms in the right organisational context and increase CEOs' market value. Moreover, in an era of globalisation, as firms start to target fast-growing foreign markets and aim to develop market share abroad, more firms are in need of top managers with foreign experience (Lublin, 1996). Compared with demand, the supply of CEO candidates with foreign experience

is lacking. As a result, firms offer higher rewards in order to recruit and retain talented CEOs in competitive labour markets (Coff, 1997).

However, critics of the above view point out that knowledge of the firm and the industry, together with general expertise in a specific area, may be more important than foreign experience. They argue that firms with 'domestic' CEOs with no foreign experience may also be successful, as international complexity can be managed through regional managers, expatriates, locals or consultants (Carpenter, Sanders, & Gregersen, 2000). In order to answer the empirical question of whether CEOs with foreign experience receive higher pay, the following hypothesis is posited:

> *Hypothesis 1: CEO foreign experience is positively associated with total compensation.*

3.2.2 The moderating effect of firm internationalisation

In addition to CEOs' foreign experience, firms' levels of internationalisation may also affect CEOs' total compensation levels for several reasons. First, the value of CEOs' foreign experience increases as firms strengthen their global strategic positioning and increase CEO's discretion and bargaining power (Carpenter & Fredrickson, 2001). Greater managerial discretion may lead to higher levels of CEO pay (Finkelstein & Boyd, 1998).

Second, CEOs' ability to manage international complexity may be better realised and more critical to firms with increasing international commitments (Ghoshal & Bartlett, 1990; Sanders & Carpenter, 1998). Moreover, as the level of firm internationalisation increases, information-processing demands and the task complexity of the CEO increases (Carpenter & Sanders, 2004; Conyon et al., 2013). Consequently, CEOs' international experience may be more important for firms with higher levels of

international exposure, and firms may pay compensation premiums to CEOs with such skills. Accordingly, it is hypothesised that:

> *Hypothesis 2: The higher the level of firm internationalisation, the stronger the effect of CEOs' foreign experience on total compensation.*

3.2.3 Foreign experience and firms' international expansion

The rationale for Hypotheses 1 and 2 is the expectation that CEOs' foreign experience is valuable to the firm. From an upper echelons perspective, firms with CEOs who have foreign experience are more likely to engage in foreign markets. Foreign experience among top managers has been associated with lower psychological distance in doing business overseas, in the form of appreciating differences in language, culture, business practices and legislation (Melin, 1992), greater awareness of international opportunities (Black, 1997), better ability to deal with the uncertainty associated with international opportunities (Carpenter, Pollock, & Leary, 2003; Sambharya, 1996), and greater confidence in foreign environments (Tung & Miller, 1990).

From a resource dependence perspective, CEOs with foreign experience provide unique and vital resources to connect firms with international markets. Foreign experience develops CEOs' international networks, which in turn provide critical resources enabling firms to compete in the global environment (Daily, Certo, & Dalton, 2000; Roth, 1995). CEOs with foreign experience also have better knowledge of foreign local markets as well as relevant stakeholders (e.g. suppliers, customers, employers), leading to better identification of attractive investments. Furthermore, hiring an international CEO signals a firm's willingness to explore foreign markets, increasing its credibility among investors and stakeholders (Schmid & Dauth, 2014).

All of the above factors are likely to result in CEOs with foreign experience expanding their firms into foreign markets (Erramilli, 1991) and performing better in acquisitions. Accordingly, it is hypothesised that:

Hypothesis 3a: CEOs' foreign experience is positively associated with firms' foreign expansion.

Hypothesis 3b: CEOs' foreign experience is positively associated with firms' foreign acquisition performance.

3.3 Sample and Methodology

3.3.1 Data sources and sample

Data were drawn from four separate sources.[20] CEO compensation data, corporate governance variables and CEO characteristics were drawn from BoardEx; firm-level data, including firm revenues, stock returns and accounting data were derived from Datastream; data on foreign acquisitions were obtained from Thomson's SDC Platinum; and cultural distance index data were derived from Hofstede's cultural dimensions.

Thomson's SDC Platinum is the world's foremost financial transactions database, providing information on new issues, mergers and acquisitions, syndicated loans and private equity. Examples of previous literature using Thomson's SDC Platinum include Aybar and Ficici (2009), Cuypers, Cuypers, and Martin (2016), El-Khatib, Fogel, and Jandik (2015) and Gerakos, Piotroski, and Srinivasan (2013).

Hofstede's cultural dimensions have become an important part of international business research and have been used to capture differences across cultures to

[20] See Chapter 2 for descriptions of the BoardEx and Datastream datasets.

examine a broad range of phenomena, including mergers and acquisitions (Stahl & Tung, 2014). The model of national culture consists of six dimensions: the power distance index, individualism versus collectivism, masculinity versus femininity, the uncertainty avoidance index, long-term orientation versus short-term normative orientation, and indulgence versus restraint. Previous studies using Hofstede's cultural dimensions include Aybar and Ficici (2009) and Stahl and Tung (2014).

The sample for this study consisted of all firms in the UK's FTSE 350 index between 2003 and 2011.[21] Firms in the financial sector and utility industries were excluded. After excluding firms with missing financial, stock market, corporate governance and CEO demographic background information, the final sample consisted of 329 unique firms, 508 unique CEOs and 1,834 firm years.[22] The final sample contained 104 unique foreign CEOs and 360 firm years with foreign CEOs, representing approximately 20 per cent of the original sample.

3.3.2 Methodology

First, to test the hypotheses, the following panel data regression model was estimated:

$$y_{it} = \alpha + \beta * ForeignExperience_{it} + \sum \gamma * ControlVariables_{it} + \sum Industry_k + \sum Year_t + \varepsilon_{it}$$

The dependent variable y_{it} is CEO total compensation for Hypotheses 1 and 2, and level of internationalisation and acquisition performance for Hypothesis 3.

[21] The constituent list of FTSE 350 firms was downloaded from Datastream for the beginning of each year (January).
[22] Numbers of firms per year were 230 for 2003, 225 for 2004, 234 for 2005, 219 for 2006, 206 for 2007, 195 for 2008, 189 for 2009, 177 for 2010 and 159 for 2011.

$ForeignExperience_{it}$ captures three different types of foreign experience: nationality, education and working experience. $ControlVariables_{it}$ contains a set of firm-level control variables. Definitions of the main variables are presented in Appendix A and explained in Section 3.3.3. In addition, a set of industry dummies was included to capture inter-industry differences, and a set of year dummies was included to control for macro-economic shocks.

It is difficult to identify statistically the causal effect of foreign experience on CEO compensation. An ideal experimental design would require the random assignment of firms into treatment and control groups, which is rare in general and impossible in this context (Oxelheim et al., 2013). The OLS estimation proposed here assumes that the presence of an international CEO is exogenous. However, it is likely to be endogenous, and depends on both the firm's demand for this attribute and the willingness of the candidate to join the firm (Estélyi & Nisar, 2016; Masulis, Wang, & Xie, 2012). More specifically, executives with foreign experience may be attracted to multinational firms because of their international skill sets. Alternatively, firms seeking to expand internationally may hire these international CEOs.

The endogeneity of CEO selection is documented in the previous literature. Magnusson and Boggs (2006) show that CEO selection decisions are influenced by both CEOs' international experience and firms' levels of internationalisation. Focusing on foreign executive appointments, Greve, Biemann, and Ruigrok (2015) find that such appointments are associated with individual experiential characteristics, the prior performance of the firm and the firm's overall level of internationalisation. Therefore, a general concern in the literature is that firms that employ international CEOs may be different from firms that do not, for predictable and observable reasons.

If these are correlated with the presence of international CEOs, estimates derived from the OLS estimator will be biased and inconsistent. In other words, in comparing two different firms, the coefficient of foreign experience estimated by OLS will be overstated, as it captures the effect of other covariates in addition to whether the CEO has foreign experience.

This study employed a propensity score-matching design to deal with the endogeneity concern. This is a valid way to mitigate endogeneity if matching between CEOs and firms may be based on predictable/observable characteristics (Angrist & Pischke, 2008; Armstrong, Ittner, & Larcker, 2012; Rosenbaum & Rubin, 1983).[23] The purpose of propensity score matching was to find a set of firms employing domestic CEOs that was as statistically alike as possible to a set of firms employing international CEOs, using a matching algorithm with observable features (Heckman, Ichimura, & Todd, 1998; Imbens, 2000). This then enabled the average treatment effect of the treated international CEO group (i.e. ATT) to be determined. In other words, after matching, differences in total compensation could be attributed to whether or not the CEO had foreign experience, rather than to differences in the other covariates.

[23] In principle, as noted in the text, the panel nature of the data would have allowed the inclusion of firm-level fixed effects, but the researcher chose not to do so. Instead, the analysis relied on OLS and propensity score matching. Because the focus was on the CEO rather than the firm, the main variables of interest had low within-firm variation. Also, the other right-hand-side variables in the regression model were time-invariant. As a result, including firm-level fixed effects would have absorbed much of the variation under investigation. Therefore, a firm-level fixed effects estimator was not used. An alternative technique to deal with potentially endogenous right-hand-side variables is to use instrumental variables. However, it was unclear *ex ante* what the correct identification restriction was that would determine the selection of international CEOs but not total compensation. Therefore, appropriate instruments were hard to find. The strategy adopted in this study was to address the potential endogenous selection of foreign CEOs using propensity scoring methods.

3.3.3 Dependent variables

To test Hypotheses 1 and 2, CEO total compensation was measured as the per year sum of salary, bonus, the value of stock options granted during the fiscal year, and the value of restricted stock or other equity granted during the fiscal year, using data drawn from BoardEx. Table 9 shows that the average CEO in the sample earned approximately £2,052,000. The median value was significantly lower, at around £1,150,000, indicating that the distribution of CEO total compensation was skewed. Therefore, the natural logarithm was used in the empirical analyses.

To test Hypothesis 3a, foreign expansion, indicating the level of internationalisation, was captured with two measures: the percentage of foreign sales and the likelihood of foreign acquisitions.

Table 9: Descriptive Statistics

Variable	Number	Mean	Std Dev	Median
CEO characteristics				
Foreign CEO (non-UK)	1,834	0.196	0.397	0
National CEO with foreign education	1,834	0.107	0.310	0
National CEO with foreign working experience	1,834	0.522	0.500	1
CEO age	1,834	51.623	6.361	52
CEO tenure	1,834	5.576	5.171	4.1
CEO compensation				
Total compensation (£000)	1,834	2,052	3,317	1,150
Firm foreign activities				
Percentage of foreign sales	1,834	0.461	0.347	0.495
Foreign Acquisition	904	0.511	0.5	1
CAR (-1, +1)	904	0.006	0.04	0.004
CAR (-5, +1)	904	0.005	0.053	0.003
Firm characteristics				
Net Sales/Revenues	1,834	4,312,720	17,200,000	880,988
Stock returns (1 year)	1,834	0.190	0.594	0.139
Return on Asset	1,834	0.048	0.127	0.056
Stock volatility	1,834	0.320	0.110	0.300
Leverage	1,834	0.373	0.700	0.340
Market to book value	1,834	0.996	54.519	2.130
Governance characteristics				
Board size	1,834	8.921	2.494	9
Non-executive ratio	1,834	0.524	0.134	0.5
CEO is Chairman	1,834	0.177	0.382	0
Compensation committee size	1,834	3.821	1.085	4
Blau Index of Board Diversity	1,834	0.199	0.192	0.198

Note: This table shows summary statistics for the key variables for a sample of all FTSE 350 firms from 2003 to 2011. CEO compensation-related variables are reported in 000s of GBP.

The percentage of foreign sales captures the relative importance of and dependence on foreign versus domestic markets. It is commonly used as a proxy for global diversification (i.e. level of internationalisation) in previous studies, for example Denis, Denis, and Yost (2002), Greve, Biemann, and Ruigrok (2015) and Moeller and Schlingemann (2005). As the sales data in Datastream have limitations which require special attention, Dastidar's (2009) approach was followed to obtain the final data, with adjustments tailored to the requirements of this study. Sales data for each firm year in Datastream are broken down by product and geographic segments. The first limitation was that the maximum segment number in Datastream is ten, so if a company has more than ten segments the remaining segments are included in segment 10. However, this happened very rarely in the sample for this study (approximately 0.1 per cent). The second limitation was that, since there is no clear definition of the scope of each segment, the data provided by the firm were inconsistent. Some firms provided segment sales data by country and others by region. As a result, in this study, the sample was divided into broader regions rather than countries.[24] This study focused on both developed and emerging markets according to Standard & Poor's list, and divided these countries into six regions: Asia, Europe, North America, Africa, South America and Oceania. All other countries were categorised as 'rest of the world'. A breakdown of countries is provided in Appendix C. The third limitation was that segment sales represented international operations, which included export sales when they could not be isolated out. However, according to Datastream, this only represents a small fraction of the total data. Furthermore, accounting data on

[24] Domestic operations data are available in geographic segment fields. In this study, UK sales were taken as domestic sales; however, it was noted that some firms report both European and UK sales as domestic sales, which may introduce potential measurement error when calculating the percentage of foreign sales. In robustness tests, to control for this effect, an indicator variable was included that equalled one if domestic sales consisted of UK and Europe. The main results remained consistent.

Datastream are primarily consolidated data, while segment data are not. As a result, the sum of segment sales might be greater than the firm's total sales. In such cases, these observations were dropped from the sample. Dastidar (2009) points out that the results do not change materially if these observations are included. In addition, observations were dropped where the segment sales were less than 90 per cent of total sales (Berger & Ofek, 1995; Lins & Servaes, 1999).

Foreign acquisition is an indicator variable that equals one if the firm made a foreign rather than domestic acquisition (Andriosopoulos & Yang, 2015; Giannetti, Liao, & Yu, 2015).

To test Hypothesis 3b, firms' foreign performance was captured by acquisition performance with short-term cumulative abnormal returns around the acquisition announcement date. Cumulative abnormal returns were calculated following Brown and Warner's (1985) method. Acquisition announcement dates were obtained from Thomson's SDC Platinum and stock price data were collected from Datastream. Abnormal returns were calculated using a market model[25] as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

where R_{it} is the actual return of firm i on day t, α_i is the market model constant for firm i, β_i is the systematic risk of firm i, and R_{mt} is the return on the FTSE All Share Price Index[26] on day t. The price index (PI) data type was used to calculate daily

[25] A range of models may be applied to calculate abnormal returns, such as the mean-adjusted return model, the capital asset pricing model (CAPM) and the market-adjusted model. The consensus in the event study literature is that results are not sensitive to the choice of the model (Aybar & Ficici, 2009; Brown & Warner, 1985).

[26] Examples of other studies that apply the FTSE All Share Price Index include Doukas and Petmezas (2007) and Schoenberg (2006).

returns, adjusted for capital changes. The coefficients α_i and β_i were estimated using a 255-day estimation period from *t*=-11 to *t*=-265, where *t*=0 is the event day. Abnormal returns (AR_{it}) were then computed by subtracting expected from actual returns. The cumulative abnormal return (CAR) was the summation of abnormal returns over the event window. Two primary event windows (-1, +1) and (-5, +1) were employed. A three-day event window (-1, +1) is commonly used in the previous literature, and a longer event window (-5, +1) was also used in this study to take account of the possibility of information leakage before the official deal announcement.[27]

3.3.4 Independent variables

Previous studies use different measures to capture top managers' international experience. Early research relied on the number of years of international assignments (Carpenter & Fredrickson, 2001; Daily, Certo, & Dalton, 2000; Sullivan, 1994). As top managers' internationalisation is a multi-dimensional phenomenon, a more comprehensive measure is required to fully capture top managers' international exposure (Lee & Park, 2006). Black (1997) uses nationality of the top management team as a proxy for international orientation. Herrmann and Datta (2005) calculate the percentage of individuals in the top management team with international work experience. In addition, with a concern that any indicator only covers a certain aspect of managers' international experience (Nielsen, 2010), some studies produce a composite index by combining several types of international experience (Lee & Park, 2008; Oxelheim et al., 2013; Schmid & Dauth, 2014). However, the effects of each type are then overlooked.

[27] In robustness checks, a variety of different event windows was also used – (-3, +3), (-5, +5), (-10, +10) and (-10, +5) – and the results were largely the same.

This study seeks to fill this void by analysing three distinct types of CEO foreign experience: foreign nationality, international education and foreign working experience. These were captured by *Foreign CEO*, *National CEO with foreign education* and *National CEO with foreign working experience*. Since foreign CEOs are likely to have foreign education and foreign working experience, only national CEOs' foreign education and working experience were considered in order to isolate their impact from that of foreign CEOs. By not combining several types into a single index, as in the previous literature, this study provides detailed analysis of the impact of each type. Appendix B presents the country distribution of foreign CEOs' nationality in this study. The largest number of non-UK CEOs was from the US, followed by Ireland, Australia and France. As shown in Table 9, around 20 per cent of CEOs in the sample were of foreign nationality, 11 per cent had foreign education, and 52 per cent had foreign working experience.

3.3.5 Control variables

In addition to the main explanatory variables, a set of firm-specific economic and corporate governance control variables was also used. Previous studies find that these have an effect on CEO compensation (Carpenter, Sanders, & Gregersen, 2001).

With regard to firm-specific economic controls, size of firm was proxied by the logarithm of sales, and firms' levels of internationalisation were proxied by the percentage of foreign sales. To avoid confounding the impact of international diversification and industrial diversification, the number of industry segments was also included (Carpenter, Sanders, & Gregersen, 2001; Dastidar, 2009; Giannetti, Liao, & Yu, 2015). All these three controls indicate organisational complexity. Firm performance was proxied by returns on assets and stock returns, capturing accounting-

based and market-based performance. Firm growth opportunity was proxied by the market-to-book ratio. Firm risk was proxied by stock volatility and leverage. Stock volatility is the standard deviation of annualised monthly stock returns over the calendar year, and leverage was computed as total debt over total assets.

In terms of corporate governance controls, board characteristics were captured by the natural logarithm of board size, the natural logarithm of compensation committee size, CEO–chair duality and non-executive ratio. CEOs' skills and experience were proxied by the logarithms of CEO age and tenure. In addition, the study controlled for the effect of internationalisation of the board (Carpenter, Geletkanycz, & Sanders, 2004; Certo et al., 2006; Finkelstein et al., 2009).[28] Boards' nationality diversity was proxied by the Blau index of diversity (Blau, 1977).[29] As shown in Table 9, firm-level characteristics and corporate governance variables were consistent with other studies based on UK data (Conyon, Peck, & Sadler, 2009; Gerakos, Piotroski, & Srinivasan, 2013).

In examining acquisition performance, following the previous literature (Aybar & Ficici, 2009), the study also controlled for common acquisition deal-specific characteristics. These included relative size, prior cross-border acquisition experience, publicly-listed target, acquirer and target firms being in the same industry, cash/stock payments only, tender offers and stakes held prior to acquisition. In addition, a cultural distance index (CDI) was included to measure cultural differences between

[28] For recent review papers, see Carpenter, Geletkanycz, & Sanders (2004); Certo et al. (2006) and Finkelstein, Hambrick, & Cannella (2009).

[29] In robustness checks, the effect of board nationality composition was also considered, proxied by the percentage of foreign directors. As this percentage was highly correlated with the Blau index (p=0.85), the Blau index was replaced with the percentage of foreign directors and the main regression re-estimated. The percentage of foreign directors did not affect CEO compensation, and the main results held.

target and acquiring countries, as well as interactions between difference types of CEO foreign experience and CDI. CDI was computed as follows:[30]

$$CDI_i = \frac{1}{N}\frac{1}{6}\sum_{j=1}^{6} Rank_j(CD_{ij})$$

where CD_{ij} is the absolute difference between acquirer- and target-country dimension scores for cultural dimension j. j takes a value from 1 to 6, each representing a specific dimension: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence. $Rank_j(CD_{ij})$ is a ranking function which assigns a rank from the least (rank of 1) to most difference (rank of N). CD_{ij} is the jth measure of cultural difference for acquisition i. CDI_i takes values from 0 to 1 by design: the higher the CDI_i, the higher the cultural distance.

3.4 Empirical Results

Before conducting multivariate regression analysis, Pearson correlation coefficients were computed between the independent variables to ensure the validity of the regression results. Table 10 shows the resulting correlation matrix, which indicated no severe multicollinearity problems. The variance inflation factors (VIFs) of the independent variables were also computed for each regression. All values were below the threshold value of 10 (Hair et al., 2009), confirming that multicollinearity was not problematic in these analyses.

[30] The cultural distance index was computed based on methods used by Antia, Lin, and Pantzalis (2007) and Aybar and Ficici (2009). Their method was extended by including all six dimensions (they used four), as the data covered a large number of countries since 2011.

3.4.1 Foreign experience and CEO compensation

Table 11 shows the results of the analyses testing Hypotheses 1 and 2 based on the OLS estimator (with robust standard errors).[31] Column 1 includes the variables of interest (Hypothesis 1). Except for national CEO with foreign education, the coefficients for both foreign CEO and national CEO with foreign working experience are positively correlated with total compensation. The economic magnitudes of these two CEO foreign experience coefficients are also significant. CEOs with foreign nationality and national CEOs with foreign working experience received higher total compensation, by approximately 60 per cent (t=9.372, p=0.000) and 32 per cent (t=7.933, p=0.000) respectively. This may be explained by variations in the quantity and quality of value provided by different types of foreign experience.

Foreign CEOs provide valuable human capital to the firm as they have detailed knowledge of the region from which they originate, including economic and market factors as well as institutions such as culture and norms. On the other hand, national CEOs with foreign working experience provide firms with valuable social capital, as they have useful networks of local contacts, personal networks with managers in foreign firms and internal advice networks. Neither of these can be easily obtained through foreign education.

[31] Year and industry dummies were included but are not reported for simplicity. The main results were robust to the inclusion of other CEO characteristics such as gender and the log of CEO network size.

Table 10: Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Foreign CEO (non-UK)	1.00													
2	National CEO with foreign education	-0.17	1.00												
3	National CEO with foreign working experience	-0.52	0.21	1.00											
4	Percentage of foreign sales	0.34	-0.06	-0.06	1.00										
5	Log of sales	0.22	0.04	-0.07	0.11	1.00									
6	Stock volatility	-0.09	-0.03	0.15	-0.03	-0.54	1.00								
7	Leverage	0.01	-0.05	0.05	0.01	0.20	-0.09	1.00							
8	Blau index of board diversity (nationality)	0.52	-0.01	-0.13	0.52	0.37	-0.13	0.09	1.00						
9	Log of board size	0.21	0.02	-0.04	0.13	0.56	-0.34	0.13	0.41	1.00					
10	Non-executive ratio	0.15	0.05	0.03	0.21	0.33	-0.13	0.04	0.19	0.04	1.00				
11	CEO is Chairman	0.03	0.00	-0.07	-0.08	-0.07	0.02	0.03	-0.04	0.02	-0.26	1.00			
12	Log comp. comm. size	0.06	-0.05	-0.03	0.10	0.38	-0.26	0.14	0.24	0.41	0.32	-0.18	1.00		
13	Log of CEO age	0.14	-0.05	-0.04	0.16	0.11	-0.14	0.06	0.11	0.11	0.01	0.05	0.05	1.00	
14	Log of CEO tenure	-0.11	0.07	-0.02	-0.02	-0.06	-0.06	-0.13	-0.12	0.07	-0.14	0.00	0.00	0.26	1.00

Note: This table shows Pearson correlation coefficients between the independent variables.

Column 2 of Table 11 includes common controls predicting total compensation. While the coefficients for foreign CEO and national CEO with foreign working experience remain significant, their economic magnitudes decrease to 35 per cent (t=6.351, p=0.000) and 26 per cent (t=8.062, p=0.000) respectively. The impact of foreign experience is still substantial, increasing total pay by around a third. These results are consistent with Hypothesis 1. In addition, these coefficients are larger than the coefficient for firm size (log of sales: β=0.228, t=17.798, p=0.000), indicating that CEO foreign experience is one of the main drivers of CEO pay premiums. The coefficients for the control variables are consistent with previous studies based on UK data (Conyon, Peck, & Sadler, 2009; Kabir & Minhat, 2014).

Column 3 includes interactions between the three types of CEO foreign experience and the percentage of foreign sales, enabling analysis of the moderating effect of levels of internationalisation on the relationship between CEO foreign experience and total compensation (Hypothesis 2). In terms of foreign CEOs, the coefficient becomes insignificant (t=0.618, p=0.537) while the coefficient for its interaction with the percentage of foreign sales is positive and significant (β=0.514, t=2.394, p=0.003). This indicates that the impact of foreign nationality on compensation is through the percentage of foreign sales. On the other hand, while the coefficient for national CEOs with foreign working experience remains significant (β=0.167, t=3.338, p=0.001), the coefficient for its interaction with the percentage of foreign sales is also significant, with greater economic effect (β=0.272, t=2.865, p=0.004). This indicates not only that the impact of foreign working experience is partially driven by the percentage of foreign sales, but also that foreign working experience itself has intrinsic value, as reflected in higher compensation. Generally, the results reveal that the impact of

CEOs' foreign experience on total compensation is mainly through the percentage of foreign sales.

In other words, the higher the level of internationalisation, the stronger the positive correlation between CEOs' international experience and total compensation. This is consistent with Daily, Certo, and Dalton's (2000) view that CEOs' foreign experience is more important for firms with higher levels of international exposure. As a result, firms with higher levels of internationalisation are willing to pay more to recruit and retain such CEOs. These results are consistent with Hypothesis 2.

To better understand the effects of foreign experience, two further analyses were performed. First, each of the foreign experience variables was examined in greater depth (Table 12).[32] This revealed that foreign CEOs without any UK experience were responsible for the main impact of foreign CEOs, indicating that foreign experience is important to the firm, and that foreign CEOs with foreign education and working experience receive higher pay. National CEOs with foreign MBA degrees were the main contributors to the impact of national CEOs with foreign education, indicating that a foreign MBA provides a vital channel for CEOs to gain social capital (e.g. international networks), which is rewarded in compensation contracts. Both foreign board and non-board experience contributed to the impact of national CEOs with foreign working experience, suggesting that firms appreciate not only the skills and reputation of CEOs who have foreign working experience, but also the networks that CEOs gain from such experience.

[32] Foreign CEOs were split between foreign CEOs without UK experience, foreign CEOs with UK education and foreign CEOs with UK work experience. National CEOs with foreign education were then split between those with foreign MBA education and foreign non-MBA education; and national CEOs with foreign working experience were split between those with foreign board experience and foreign non-board experience.

Table 11: CEO foreign experience and total compensation

	Log of total compensation		
	(1)	(2)	(3)
Variables of interest			
Foreign CEO (non-UK)	0.599***	0.353***	0.080
	(0.064)	(0.056)	(0.129)
National CEO with foreign education	0.130*	-0.071+	-0.067
	(0.062)	(0.042)	(0.064)
National CEO with foreign working experience	0.317***	0.262***	0.167***
	(0.040)	(0.033)	(0.050)
Percentage of foreign sales	0.503***	0.127*	-0.096
	(0.064)	(0.054)	(0.082)
Percentage of foreign sales * Foreign CEO (non-UK)			0.514**
			(0.175)
Percentage of foreign sales * National CEO with foreign education			-0.011
			(0.129)
Percentage of foreign sales * National CEO with foreign working experience			0.272**
			(0.095)
Control variables			
Number of product segments		0.007	0.008
		(0.009)	(0.009)
Log sales		0.228***	0.228***
		(0.013)	(0.013)
Stock returns (1 year)		0.130***	0.133***
		(0.035)	(0.035)
ROA		0.640***	0.621***
		(0.171)	(0.170)
Stock volatility		-0.742***	-0.754***
		(0.182)	(0.181)
Leverage		-0.020	-0.019
		(0.051)	(0.051)
Market-to-book ratio		0.006*	0.006*
		(0.003)	(0.003)
Blau index of board diversity (nationality)		0.068	0.073
		(0.099)	(0.099)
Log of board size		0.627***	0.632***
		(0.075)	(0.075)
Non-executive ratio		0.846***	0.837***
		(0.138)	(0.138)
CEO is Chairman		-0.179***	-0.186***
		(0.043)	(0.043)
Log comp. comm. size		0.054	0.056
		(0.062)	(0.062)
Log CEO age		-0.489***	-0.506***
		(0.134)	(0.135)
Log CEO tenure		0.107***	0.109***
		(0.019)	(0.019)
Constant	6.310***	3.558***	3.674***
	(0.117)	(0.564)	(0.560)
Observations	1,834	1,834	1,834
Adjusted R-squared	0.237	0.599	0.602
Year and Industry dummies	Yes	Yes	Yes

Note: This table presents the regression results for CEO foreign experience and total compensation with FTSE 350 firms from 2003 to 2011. Variable definitions are provided in Appendix A. Stock return, ROA, leverage and market-to-book ratio are winsorized at the 1st and 99th percentile; robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

The results also show that firms value both CEOs' human capital, and their social capital stemming from foreign experience.

Second, the potential 'US CEO' effect was considered (Table 13). Gerakos, Piotroski, and Srinivasan (2013) find that greater market interaction with the US market by non-US firms is associated with greater use of US-style pay and a reduction in the US-UK pay gap. To examine whether US CEOs drive the main effect of foreign CEOs, foreign CEOs were split between US CEOs and non-US foreign CEOs. The results reveal that the coefficients of both variables are statistically and economically significant, indicating that it is the foreign CEO effect that matters relative to UK CEOs, rather than just the US CEO effect.

Table 12: Further analysis of CEO foreign experience and total compensation (1)

	Log of total compensation		
	(1)	(2)	(3)
Panel A: Foreign nationality			
Foreign CEO (non-UK)		0.334***	0.057
		(0.061)	(0.049)
Foreign CEO (non-UK) without UK experience	0.417***		
	(0.060)		
Foreign CEO (non-UK) with UK education	0.052		
	(0.097)		
Foreign CEO (non-UK) with UK working experience	-0.163		
	(0.226)		
Panel B: Foreign education			
National CEO with foreign education	-0.073+		-0.063
	(0.043)		(0.042)
National CEO with foreign MBA education		0.154*	
		(0.062)	
National CEO with foreign non-MBA education		-0.033	
		(0.044)	
Panel C: Foreign working experience			
National CEO with foreign working experience	0.265***	0.245***	
	(0.033)	(0.033)	
National CEO with foreign board role experience			0.098**
			(0.030)
National CEO with foreign non-board role experience			0.220***
			(0.031)
Observations	1,834	1,834	1,834
Adjusted R-squared	0.603	0.601	0.601
Controls	Yes	Yes	Yes
Year and industry dummies	Yes	Yes	Yes

Note: This table presents the regression results for CEO foreign experience and total compensation with FTSE 350 firms from 2003 to 2011. Variable definitions are provided in Appendix A. Stock returns, ROA, leverage and market-to-book ratio are winsorized at the 1st and 99th percentiles. A set of firm-specific economic and corporate governance controls were included but are not reported for simplicity. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

Panel A: 'Foreign CEO (non-UK) without UK experience' equals one if the non-UK CEO does not have any UK experience; 'Foreign CEO (non-UK) with UK education' equals one if the non-UK CEO has UK education; 'Foreign CEO (non-UK) with UK working experience' equals one if the non-UK CEO has UK working experience.

Panel B: 'National CEO with foreign MBA education' equals one if the CEO is British but has a foreign MBA degree; 'National CEO with foreign non-MBA education' equals one if the CEO is British but has a foreign degree but not an MBA.

Panel C: 'National CEO with foreign board role experience' equals one if the CEO is British but has board role experience in a non-UK country; 'National CEO with foreign non-board role experience' equals one if the CEO is British but has non-board role experience in a non-UK country.

Table 13: Further analysis of CEO foreign experience and total compensation (2)

	Log of total compensation		
	(1)	**(2)**	**(3)**
US CEO	0.747***	0.544***	0.507+
	(0.086)	(0.068)	(0.283)
Non-US foreign CEO	0.523***	0.260***	0.076
	(0.078)	(0.063)	(0.143)
National CEO with foreign education	0.129*	-0.073+	-0.065
	(0.062)	(0.043)	(0.064)
National CEO with foreign working experience	0.321***	0.267***	0.167***
	(0.040)	(0.032)	(0.050)
Percentage of foreign sales	0.491***	0.120*	-0.086
	(0.065)	(0.054)	(0.082)
Percentage of foreign sales * US CEO			0.171
			(0.342)
Percentage of foreign sales * non-US foreign CEO			0.394+
			(0.209)
Percentage of foreign sales * national CEO with foreign education			-0.018
			(0.129)
Percentage of foreign sales * national CEO with foreign working experience			0.276**
			(0.095)
Observations	1,834	1,834	1,834
Adjusted R-squared	0.240	0.603	0.604
Controls	No	Yes	Yes
Year and industry dummies	Yes	Yes	Yes

Note: This table presents regression results for CEO foreign experience and total compensation with FTSE 350 firms from 2003 to 2011. Variable definitions are provided in Appendix A. 'US CEO' equals one if the CEO is American; 'Non-US foreign CEO' equals one if the CEO is foreign-born but not from the US. Stock returns, ROA, leverage and market-to-book ratio are winsorized at the 1st and 99th percentiles. A set of firm-specific economic and corporate governance controls were included but are not reported for simplicity. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

A primary concern is that the presence of an international CEO may be endogenous. As described earlier, this study employed a propensity score-matched pair research design to help resolve selection bias. The propensity score method proceeded in two steps. The first step was to predict the selection decision of international CEOs, by estimating a probit model of the binary outcome that equals one if the firm hired an international CEO, with observable firm characteristics as explanatory variables.[33] Table 14 shows the results of two probit[34] models (one with economic covariates only, and the other with economic and governance covariates).[35] All explanatory variables were lagged by one year, while controlling for industry and year.

The results in Table 14 show that firms that hired an international CEO differ systematically from those that did not, indicating that the selection of international CEOs is strongly endogenous with firm-level characteristics. The results shown in Column 1, which includes only economic covariates, suggest that more internationalised firms were more likely to hire international CEOs, consistent with Magnusson and Boggs' (2006) finding. Also, the results indicate that larger and more industrially diversified firms that performed less well and had higher risk and lower growth opportunities were more likely to select international CEOs. The results shown in Column 2, which includes both economic and governance covariates, show that governance covariates also influenced the choice of international CEOs. Board diversity, board size, the independent director ratio and CEO age are positively

[33] The results reveal that firm characteristics have different effects on firms' choice of CEOs with different types of foreign experience. To investigate a set of universal factors, a composite international experience indicator was employed that equalled one if the CEO had any type of foreign experience.
[34] For binary outcomes, logit and probit models usually yield similar results (Caliendo, 2006, p.73).
[35] Only covariates that determined the outcome model were included, as including insignificant variables may inflate the variance of estimated treatment effects (Brookhart et al., 2006; Caliendo & Kopeinig, 2008). Therefore, compared with the control variables in Table 11, stock return, leverage and CEO duality were excluded as their coefficients were not significant.

correlated with the presence of international CEOs, while the coefficients for the size of compensation committee and CEO tenure are negative.

In summary, consistent with the previous literature (Greve, Biemann, & Ruigrok, 2015; Magnusson & Boggs, 2006), the findings of this study suggest that appointments of international CEOs are influenced by firm size, the quality of corporate governance, firms' levels of internationalisation, prior performance, and the experiential characteristics of CEO candidates. The predicted probability (i.e. the propensity score) of the presence of international CEOs, shown in Column 2 of Table 14, formed the basis of the matching procedure.

In the second step, firms were matched using a nearest neighbour algorithm with a caliper width of 0.01 and no replacement. The observations were restricted to common support. Table 15 provides an assessment of the efficacy of the matching by examining the covariate balance between matched pairs. First, the sample means of each covariate were compared between the treated and control groups using parametric t-tests.

Table 14: Determinants of hiring international CEOs

	CEO with any type of foreign experience 1/0	
	(1)	**(2)**
Percentage of foreign sales (t-1)	0.834***	0.250+
	(0.121)	(0.141)
Number of product segments (t-1)	0.133***	0.144***
	(0.024)	(0.025)
Log of sales (t-1)	0.155***	0.014
	(0.029)	(0.037)
ROA (t-1)	-1.246**	-0.814+
	(0.421)	(0.437)
Price volatility (t-1)	1.847***	1.650***
	(0.478)	(0.495)
Market-to-book ratio (t-1)	-0.014+	-0.015+
	(0.008)	(0.008)
Blau index of board diversity (nationality) (t-1)		1.847***
		(0.271)
Log of board size (t-1)		0.714***
		(0.201)
Non-executive ratio (t-1)		1.827***
		(0.357)
Log of comp. comm. size (t-1)		-0.553**
		(0.174)
Log of CEO age (t-1)		0.663*
		(0.321)
Log of CEO tenure (t-1)		-0.103**
		(0.040)
Constant	-2.884***	-5.378***
	(0.544)	(1.370)
Observations	1,527	1,527
Pseudo R squared	0.119	0.177
Year and industry dummies	Yes	Yes

Note: This table presents probit estimates of the determinants of hiring international CEOs with FTSE 350 firms from 2003 to 2011. Variable definitions are provided in Appendix A. Stock returns, ROA, leverage and market-to-book ratio are winsorized at the 1st and 99th percentiles. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

Table 15: Covariate balance

Panel A: Individual covariate balance

	Mean			%reduct	t-test	
Variable	**Treated**	**Control**	**%bias**	**|bias|**	**t-stat**	**p-value**
Percentage of foreign sales (t-1)						
Unmatched	0.498	0.324	52.8		8.93	0
Matched	0.334	0.352	-5.6	89.4	-0.74	0.461
Number of product segments (t-1)						
Unmatched	3.007	2.355	39		6.46	0
Matched	2.501	2.487	0.9	97.8	0.13	0.9
Log of sales (t-1)						
Unmatched	13.839	13.391	28.7		4.47	0
Matched	13.398	13.412	-0.9	96.9	-0.13	0.896
ROA (t-1)						
Unmatched	0.042	0.064	-22.8		-3.74	0
Matched	0.055	0.058	-3.3	85.5	-0.49	0.621
Price volatility (t-1)						
Unmatched	32.432	30.340	20		3.27	0.001
Matched	31.143	31.090	0.5	97.5	0.07	0.944
Market-to-book ratio (t-1)						
Unmatched	2.491	3.308	-16.1		-2.84	0.005
Matched	2.695	3.215	-10.3	36.4	-1.37	0.17
Blau index of board diversity (nationality) (t-1)						
Unmatched	0.236	0.102	77.3		12.47	0
Matched	0.109	0.116	-3.5	95.5	-0.52	0.604
Log of board size (t-1)						
Unmatched	2.181	2.086	36.7		6.03	0
Matched	2.089	2.097	-3.1	91.6	-0.44	0.663
Non-executive ratio (t-1)						
Unmatched	0.534	0.481	40.7		6.92	0
Matched	0.483	0.497	-10.1	75.3	-1.43	0.154
Log of comp. comm. size (t-1)						
Unmatched	1.305	1.282	8.1		1.38	0.169
Matched	1.279	1.286	-2.3	71.4	-0.32	0.75
Log of CEO age (t-1)						
Unmatched	3.936	3.921	12.1		2.16	0.031
Matched	3.925	3.916	6.7	44.4	0.89	0.371
Log CEO tenure (t-1)						
Unmatched	1.181	1.443	-24.6		-4.23	0
Matched	1.392	1.369	2.2	90.9	0.31	0.759

Panel B: Covariate set balance

Sample	Mean Bias	Median Bias
Unmatched	18.6	16.1
Matched	3.4	2.7

Note: These tables assess the efficacy of matching by examining covariate balance between matched pairs.

In general, Table 15 Panel A shows that before the matching, the means of almost all covariates between these two groups are significantly different, except for the logarithm of the size of compensation committee. There is no statistically significant difference in the mean of any covariate after the matching, indicating that the matching procedures effectively increased the similarity between treatment and control groups. Second, standardised bias before and after matching was assessed, together with the reduction in bias. For most covariates, the bias reduction exceeded 80 per cent, with a minimum of 29.6 per cent for the logarithm of size of compensation committee. All covariates were below the desirable threshold of 10 per cent after matching. Also, Table 15 Panel B shows that the mean (median) bias of the set of covariates reduced from 18.6 per cent (15.4 per cent) to 3.2 per cent (3.0 per cent). In summary, the results provided confidence that compensation premiums could be estimated for firms with similar observed characteristics.

Table 16: Total compensation of international CEOs versus domestic CEOs (PSM)

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
CEO with any type of foreign experience						
Log of total compensation	Unmatched	7.32	6.87	0.45	0.05	8.33
(Treated = 345)	ATT	7.07	6.83	0.23	0.06	4.09

Note: This table presents differences in total compensation based on propensity score estimates of international CEO/domestic CEO hiring decisions. 'CEO with any type of foreign experience' equals one if the CEO has any type of foreign experience (nationality, foreign education and/or foreign working experience). The average treatment effect on the treated (ATT) measures the difference between the two groups.

Table 16 presents the average treatment effect of international experience on total compensation. [36] After matching based on firms' economic and governance characteristics, the difference in the mean log of compensation between treated and control groups decreased from 0.45 to 0.23, a reduction of around a third, indicating that the impact of CEO foreign experience was overstated before the matching (i.e. with OLS). Even so, the economic impact is still significant. Moreover, the difference after matching is statistically significant, with a t-statistic of 4.09, indicating that a compensation premium for CEOs' foreign experience still exists after controlling for selection effects.[37]

In summary, the empirical results confirm Hypotheses 1 and 2. The findings reveal that the presence of both foreign CEOs and national CEOs with foreign working experience is positively correlated with total compensation, and this relationship is stronger with higher levels of firm internationalisation. The results suggest that firms value both the human and social capital of CEOs stemming from foreign experience. Compensation premiums for CEO foreign experience were overstated in OLS regression and reduced after applying propensity score matching, but remained significant both statistically and economically.

3.4.2 Foreign experience and firms' international expansion

Table 17 shows the results of analyses testing Hypotheses 3a and 3b. The first analysis tested whether CEO foreign experience affected firms' levels of internationalisation

[36] 755 out of 1528 observations were in common support, indicating sufficient observations to make valid inferences. Many more observations (1,488) in common support were achieved if replacement was required. However, as the observations were not independent when matched with replacement, replacement was not used (Peel & Makepeace, 2012). The results were not sensitive to replacement.
[37] While OLS regressions provided average estimates of pay premiums for the whole sample (ATE), matched treatment premiums (ATT) were restricted and could only be generalised to common support (Peel & Makepeace, 2012; Tucker, 2010).

(Panel A).[38] Similar patterns were found with two different measures (the percentage of foreign sales and the likelihood of foreign acquisitions). In general, the coefficients for both foreign CEOs and national CEOs with foreign working experience are positively associated with higher levels of internationalisation, indicating that CEOs with foreign experience help firms to expand globally.[39] The coefficients for all three interactions are positive and significant, indicating that firms' internationalisation and the foreign experience of CEOs are geographically connected. These results are consistent with Hypothesis 3a and provide strong evidence that CEOs' foreign experience in a specific region increases firms' investment opportunities in that region.

An event study (Panel B) was conducted to investigate whether CEOs' foreign experience affected firms' acquisition performance, but this provided no evidence of correlation between CEOs' foreign experience and short-term performance.[40] However, a negative coefficient for the CDI indicates that the higher the cultural distance between target and acquirer country, the lower the short-term performance. The coefficient for the interaction between national CEOs with foreign working experience and CDI is positive and significant (Column 3: β=0.025, t=2.102, p=0.036; Column 6: β=0.053, t=3.356, p=0.001). This suggests that CEOs with foreign working experience buffer the negative impact of CDI on short-term acquisition performance, ameliorating the 'liability of foreignness'.

[38] Consistent with the M&A literature, to investigate acquisitions, a reduced sample (acquisition sample) was used, consisting of 904 100-per-cent stake acquisitions completed by UK firms from 2003 to 2011. Following Moeller and Schlingemann (2005), acquisitions were only considered where the bidder ended up owning 100 per cent of the target firm's assets or an entire subsidiary and the transaction value exceeded one million dollars.

[39] Since some firms had no foreign sales, the model was also examined using Tobit regressions left-censored at zero, with similar results. In addition, to account for the possibility of reverse causality, the actual percentage of foreign sales was replaced with changes in the percentage of foreign sales, and the results still held.

[40] In robustness checks, a variety of different event windows was also used, such as (-3, +3), (-5, +5), (-10, +10), (-10, +5), and the main results still held.

The sample was further split between foreign and domestic acquisitions, producing positive and significant coefficients for foreign CEOs and national CEOs with foreign working experience for event window (-5, +1) for foreign acquisitions, but an insignificant coefficient for domestic acquisitions. In non-tabulated results, CEOs with foreign nationality and national CEOs with foreign working experience increased acquisition performance by two per cent (t=2.153, p=0.032) and 1.3 per cent (t=2.036, p=0.042) respectively. Collectively, these results are consistent with Hypothesis 3b and suggest that CEO foreign experience is more valuable in foreign acquisitions, especially those with greater cultural distance between target and acquirer countries.

Analysis was also conducted to examine whether CEOs' foreign experience affected firms' overall performance, captured by returns on assets and stock returns (results not tabulated), but no relationship was found between the two. This suggests that CEOs with foreign experience are not necessarily 'better' or 'more valuable' than their counterparts, implying that the pay premium observed for CEOs with foreign experience is not simply because they possess better general managerial skills.

In summary, the results suggest that CEOs with specialist foreign knowledge may be the best match for firms where such knowledge is an important component of the CEO skills set. The results also suggest that the pay premium for CEOs with foreign experience is attributable to the value of their foreign expertise rather than their general managerial skills.

Table 17: Impact of CEO foreign experience on firms' international expansion and performance

Panel A: Firm foreign activities

	Foreign sales			Foreign acquisitions		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Foreign CEO (non-UK)	0.331***	0.101***	0.091**	0.281***	0.050	0.025
	(0.019)	(0.022)	(0.030)	(0.051)	(0.061)	(0.064)
National CEO with foreign education	-0.035	-0.061**	-0.073**	0.057	-0.074	-0.175***
	(0.024)	(0.022)	(0.023)	(0.050)	(0.052)	(0.040)
National CEO with foreign working experience	0.089***	0.038*	-0.064***	0.038	0.034	-0.143***
	(0.017)	(0.016)	(0.018)	(0.038)	(0.039)	(0.038)
Foreign CEO (non-UK) * same region			0.080**			0.351***
			(0.027)			(0.052)
National CEO with foreign education * same region			0.121**			0.347***
			(0.038)			(0.066)
National CEO with foreign working experience * same region			0.214***			0.653***
			(0.019)			(0.031)
Observations	1,834	1,834	1,834	904	904	904
Adjusted R-squared	0.269	0.418	0.472	0.088	0.181	0.399
Controls	No	Yes	Yes	No	Yes	Yes
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Firms' acquisition performance

	CAR (-1, +1)			CAR (-5, +1)		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Foreign CEO (non-UK)	-0.002	-0.001	-0.003	0.007	0.010	-0.005
	(0.004)	(0.005)	(0.010)	(0.007)	(0.008)	(0.015)
National CEO with foreign education	0.001	0.002	0.006	0.007	0.007	0.016
	(0.004)	(0.004)	(0.009)	(0.005)	(0.005)	(0.012)
National CEO with foreign working experience	-0.003	-0.003	-0.015*	0.000	0.001	-0.024**
	(0.003)	(0.003)	(0.007)	(0.004)	(0.004)	(0.009)
Cultural distance index		-0.050+	-0.061+		-0.030	-0.063
		(0.029)	(0.032)		(0.042)	(0.047)
CDI * foreign CEO (non-UK)			0.007			0.035
			(0.016)			(0.024)
CDI * national CEO with foreign education			-0.007			-0.017
			(0.016)			(0.021)
CDI * national CEO with foreign working experience			0.025*			0.053***
			(0.012)			(0.016)
Foreign acquisition	0.001	0.034*	0.033+	-0.002	0.026	0.025
	(0.003)	(0.017)	(0.017)	(0.004)	(0.023)	(0.024)
Observations	904	904	904	904	904	904
Adjusted R-squared	0.002	0.032	0.034	-0.005	-0.007	0.001
Controls	No	Yes	Yes	No	Yes	Yes
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents several regression results for the impact of CEO foreign experience on firms' international expansion and performance with FTSE 350 firms from 2003 to 2011. Variable definitions are provided in Appendix A. 'Same Region' is an indicator variable equalling one if the CEO has foreign experience in the same region as the region of the foreign sales and acquisitions. Stock returns, ROA, leverage and market-to- book ratio are winsorized at the 1st and 99th percentiles. The acquisition sample is used for regressions on foreign acquisition and firm acquisition performance (both short- and long-term) with 100 per cent stake acquisitions completed by UK firms from 2003 to 2011. A set of firm-specific economic and corporate governance controls were included but are not reported for simplicity. Robust standard errors in parentheses; *** p<0.001, ** p < 0.01, * p<0.05, + p<0.1.

3.5 Conclusions

This study investigated the relationship between CEOs' foreign experience and total compensation. Globalisation is increasing the demand for scarce internationally-seasoned CEOs, and consequently the price of CEO labour is likely to increase. This idea was tested using data from large UK firms between 2003 and 2011. The study provides empirical evidence that CEO pay is higher for CEOs with foreign experience than with domestic-only experience. An array of diagnostic tests was performed to ensure the general robustness of the main findings. Specifically, the observed foreign CEO pay premium was robust to controlling for firm-specific and corporate governance characteristics, as well as the endogenous determination of international CEO status. The results also suggest that pay premiums for international CEOs are attributable to the value of their foreign expertise and foreign networks, stemming from foreign experience, rather than their general managerial skills.

This study has particularly significant implications for other scholars, as well as managers. Given the substantial private returns of foreign experience to CEOs, as well as to their firms, this study highlights the potential importance of investing in foreign experience as a crucial part of human and social capital. Firms might find it beneficial to promote their executives' international experience (both MBA education and working) to yield future competitive advantage, and executives might be encouraged to undertake such opportunities for career development. Moreover, in showing that CEOs' foreign experience influences their corporate strategy decisions, this study highlights the importance of fit and complementarity between executive experience and the firm. The CEO selection process might be optimised to better match with corporate strategy, thereby gaining competitive advantage, especially in the global market. Last but not least, in documenting that CEO foreign experience affects

acquisition performance, this study provides practical trading strategies for investors, especially around announcements of foreign acquisitions.

As with all studies, this study has limitations that might form the basis for future research. First, the study was based on a set of large UK firms. Although these were major enterprises, accounting for an overwhelming share of capitalisation on UK equity markets, it raises the question of whether the results are generalisable to other types of firm not included in the sample (e.g. small firms and private firms). Second, due to data limitations, it was not possible to examine alternative proxies of firms' foreign activities, such as foreign production, geographic dispersion and cross-listings. Future studies might also explore other aspects in which international CEOs might help create value for firms, such as access to international capital, and the choice of capital structure in terms of the amount of equity or leveraged debt in the firm.

In conclusion, this study provides a better understanding of how CEOs' foreign experience determines their compensation contracts, and should act as a spur to further research in the field of CEO compensation and international management.

4. Conclusions

4.1 Summary and Overview of Main Findings

This thesis expands existing academic research on the determinants of CEO compensation. It identifies gaps in the extant literature relating to: i) the governance of executive compensation, the role of compensation consultants and CEO pay; and ii) the demand for CEO talent, foreign experience and private returns to CEOs in terms of compensation.

In particular, this thesis has examined the effect of compensation consultants on CEO pay, and has investigated and tested the effect of CEOs' foreign experience on their compensation. To this end, the endogeneity issue of the impact of compensation consultants on CEO pay has been addressed, and the effect of CEOs' foreign experience on their total compensation has been thoroughly explored. This fills gaps in the previous literature, and hence contributes significantly to the scholarly literature on determinants of CEO compensation.

Chapter 2 investigated the effect of compensation consultants on CEO pay levels and incentives using panel data for FTSE 350 UK firms from 2003 to 2011. First, using OLS regressions, a positive relationship was found between the presence of compensation consultants and CEO compensation levels and incentives. Second, the results of OLS regressions were found to be less robust to controlling for firm- and CEO-level fixed effects, as well as using propensity score matching. Third, no evidence was found that pay consultants are used to increase total CEO pay or inappropriately alter executive incentives in firms with weak corporate governance arrangements. In general, these results disconfirm the managerial power view that

consultants raise CEO pay or tilt compensation contracts in favour of entrenched CEOs at the expense of shareholders.

Chapter 3 investigated the relationship between CEOs' foreign experience and total compensation using panel data from large UK firms between 2003 and 2011. First, CEO total compensation was found to be higher for CEOs with foreign experience than with domestic-only experience. Second, such pay premiums were stronger in firms with higher levels of internationalisation. The main results were robust to controlling for firm-specific and corporate governance characteristics, as well as the endogenous determination of international CEO status. The findings also reveal that the pay premium for international CEOs is attributable to the value of CEOs' foreign expertise and foreign networks, rather than their general managerial skills. In general, the results suggest that CEOs' specialist skills with regard to foreign experience are valuable to the CEOs themselves.

4.2 Implications

This study has implications for other scholars and practitioners. In relation to compensation consultants, critics assert that they are part of the agency problem, rather than a solution to it. However, the findings presented in Chapter 2 indicate that the effect of consultants can by largely explained by time-invariant firm-level economic and governance characteristics, time-invariant CEO-level characteristics and endogenous selection effects. Previously-reported positive correlations between CEO compensation and consultants can be interpreted as reflecting firm characteristics and corporate governance quality. The results of this study fit better with the optimal contracting view, suggesting that compensation consultants are an important mechanism for resolving agency costs between shareholders and managers.

The results presented in Chapter 2 highlight the importance of controlling for endogeneity in corporate governance studies, and caution supporters of the managerial power view relying only on cross-sectional data. In addition, the mandatory requirement to disclose compensation consultant information raises doubt about the cost–benefit balance.

Given the substantial private returns of foreign experience to CEOs, as well as to their firms, the findings presented in Chapter 3 highlight the potential importance of investing in foreign experience as a crucial part of human and social capital. Firms are encouraged to promote international experience for their executives to yield future competitive advantage, and executives are encouraged to undertake such opportunities to improve future pay. Chapter 3 also highlights the importance of fit and complementarity between executive experience and the firm by showing that CEOs' foreign experience influences their corporate strategy decisions. The CEO selection process might be optimised to better match corporate strategy, thereby gaining competitive advantage, especially in the global market. Finally, in showing that CEOs' foreign experience affects acquisition performance, this study provides practical trading strategies for investors around announcements of foreign acquisitions.

4.3 Limitations and Suggestions for Future Research

As with all studies, this research has limitations which might form the basis for future research. First, the research considered a single country (i.e. the UK). The results should be reasonably generalisable to the US as the two countries share a common language, legal traditions and customs, but generalisability to the rest of the world may be limited.

Second, this research was based on a set of large UK firms. Although these are major enterprises, accounting for the overwhelming share of capitalisation in UK equity markets, it raises the question of whether the results are generalisable to other types of firm not included in the sample (e.g. small firms and private firms).

Third, the empirical analysis of this thesis was based on firms that survived long enough to be included in the sample (Brown, Goetzmann, & Ross, 1995). Survivorship bias is a concern because the sample covered the financial crisis of 2007-2008.

Fourth, owing to data limitations, the study presented in Chapter 3 focused on the effect of compensation consultants on CEO compensation in general. Further research might explore circumstances under which the effect of compensation consultants is more likely to be observed, such as social ties between compensation consultants and CEOs. Furthermore, the results presented in Chapter 2 suggest that compensation consultants have no significant impact on CEO pay in addition to firm characteristics. Future research on the presence of compensation consultants might explore reasons why firms continue to hire compensation consultants, such as window dressing, peer-group herding and shareholder insurance. Moreover, future research on determinants of CEO pay should explore alternative explanations, such as the effectiveness of the board and the monitoring role of institutional investors.

Lastly, owing to data limitations, it was not possible to examine alternative proxies of firms' foreign activities, such as foreign production, geographic dispersion and cross-listing. Future studies might also explore other aspects in which international CEOs might help create value for firms, such as access to international capital, and the choice of capital structure between the amount of equity or leveraged debt in the firm.

4.4 Final Remarks

In conclusion, this thesis represents an important step toward a better understanding of the determinants of CEO compensation. The empirical findings have been presented in the context of economic and organisational theory. These point to several fruitful avenues for future research and should act as a spur to further research in the field of CEO compensation.

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Appendix A: Definitions of Variables

Variable	Definition
CEO characteristics	
Foreign CEO (non-UK)	An indicator variable equalling one if the CEO has non-UK nationality (constructed from BoardEx: Nationality Mix)
National CEO with foreign education	An indicator variable equalling one if the CEO is British but has foreign education at the bachelor level or higher (constructed from BoardEx: Education (Country))
National CEO with foreign working experience	An indicator variable equalling one if the CEO is British but has foreign working experience, including board and non-board role, current and historic (constructed from BoardEx: Employment (Country))
CEO with any type of foreign experience	An indicator variable equalling one if the CEO has any type of foreign experience: nationality, foreign education and/or foreign working experience.
Log of CEO age	The logarithm of CEO age (BoardEx: Age (Yrs))
Log of CEO tenure	The logarithm of the number of years the CEO has held the role at the firm (BoardEx: Time in Role)
CEO compensation	
Log Salary	The logarithm of base annual pay (BoardEx: Salary)
Log Total Comp	The logarithm of the sum of all compensation: salary, bonus, equity-linked, pension, other (BoardEx: Total Compensation)
Salary %	Salary as a proportion of total compensation (BoardEx: Salary/Total Compensation)
Bonus %	Bonus as a proportion of total compensation (BoardEx: Bonus/Total Compensation)
Equity %	Equity-linked pay as a proportion of total compensation (BoardEx: Equity Linked/Total Compensation)
Compensation consultants	
Consultant 1/0	An indicator variable that equals one if the firm uses any compensation consultant, and zero otherwise
Top 3 consultants 1/0	An indicator variable that equals one if the firm uses any top three consultant in terms of number of clients, and zero otherwise
Non-Top 3 consultants 1/0	An indicator variable that equals one if the firm uses any non-top three consultant in terms of number of clients, and zero otherwise
Firms' foreign activities	
Percentage of foreign sales	The percentage of foreign sales over total sales (Datastream: relevant Geographic segment 1-10 Sales (WC19601~91)/ Net Sales Or Revenue (WC01001))
Foreign Acquisition	An indicator variable that equals one if the firm has a foreign acquisition (Thomson's SDC: Target Nation)
CAR (-1, +1)	The (-1, +1) three-day window acquirer cumulative abnormal return on announcement using the market-adjusted model (constructed from Datastream: Price Index (PI))
CAR (-5, +1)	The (-5, +1) seven-day window acquirer cumulative abnormal return on announcement using the market-adjusted model (constructed from Datastream: Price Index (PI))
Firm characteristics	
Log of sales	The logarithm of sales (Datastream: Net Sales Or Revenue

Variable	Definition
	(WC01001))
Stock returns (1 year)	[(RIt/RIt-1)-1]*100% (Datastream: Total Return Index (RI))
Return on assets	Net income divided by total assets (Datastream: Net Income Before Preferred Dividends (WC01651)/Total Assets (WC02999))
Stock volatility	A measure of a stock's average annual price movement to a high and low from a mean price for each year (Datastream: Price Volatility (WC08806))
Leverage	Total debt divided by total assets (Datastream: Total Debt % Total Capital (WC08221))
Market-to-book value	The market value of the ordinary equity divided by the balance sheet value of the ordinary equity in the company (Datastream: Market-to-Book Value (MTBV))
Governance characteristics	
Foreign Directors %	The number of foreign directors over the total number of directors on the board (constructed from BoardEx: Nationality Mix & Total Directors on the Board)
Blau index	The Blau index for nationality heterogeneity, measured as $1 - \sum_{i=1}^{n} P_i^2$, where P is the percentage of board members in each category and n is the total number of categories. Values of the Blau index range from 0 to 0.5, with maximum occurring when the board comprises an equal number of British and foreign directors.
Non-executive ratio	The number of non-executive directors over the total number of directors on the board (BoardEx Number of Independent NED on Board/Total Directors on the Board)
CEO is Chairman	An indicator variable that equals one if the CEO is also the chairman (BoardEx: Combined role of CEO & Chairman is present)
Log comp. comm. size	The logarithm of total number of remuneration committee numbers (BoardEx: Remuneration/Compensation Committee Size)
CEO turnover	An indicator variable that equals one if there is CEO turnover during the fiscal year, and zero otherwise
Corporate governance score	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long-term shareholder value. The original score ranges from 0 to 100. High (low) corporate governance quality is defined as above (below) the sample median (ASSET4 item: CGVSCORE)

Variable	Definition
Compensation policy score	The board of directors/compensation policy category measures a company's management commitment and effectiveness towards following best-practice corporate governance principles relating to competitive and proportionate management compensation. It reflects a company's capacity to attract and retain executives and board members with the necessary skills by linking their compensation to individual or company-wide financial or extra-financial targets. The original score ranges from 0 to 100. High (low) compensation policy quality is defined as above (below) the sample median (ASSET4 item: CGCP)
Acquisition deal characteristics	
Relative size	The ratio calculated as transaction value divided by acquirer market capitalization at the announcement day (Thomson's SDC: Value of Transaction ($mil) & Datastream: FTSMVUSD)
Cultural distance index	Takes values between 1 and 0, with values close to 1 and 0 implying significant cultural distance and proximity, respectively (constructed from Hofstede's cultural dimensions)
Prior cross-border acquisition experience	An indicator variable that equals one if the acquirer firm has prior cross-border acquisition experience (constructed from Thomson's SDC from 1985 to current acquisition date)
Target (publicly listed)	An indicator variable that equals one if the target firm is publicly listed (Thomson's SDC: Target Public Status)
Same industry	An indicator variable that equals one if acquirer and target share the same two-digit SIC code (Thomson's SDC: Acquirer & Target Primary SIC Code)
Cash payment only	An indicator variable that equals one if the deal is for cash payment only (Thomson's SDC: % to Cash)
Stock payment only	An indicator variable that equals one if the deal is for stock payment only (Thomson's SDC: % of Stock)
Tender offer	An indicator variable that equals one if the deal is a tender offer (Thomson's SDC: Tender Offer)
Stake held prior to acquisition	The percentage of acquiring firm's initial stake in target firm prior to the acquisition announcement (Thomson's SDC: Percent of Shares Held at Announcement)

Appendix B: CEO Nationality Distribution by Country

B.1. By Country

Nationality Mix	Freq.	Percent	Cum.
Australian	34	1.85	9.11
Belgian	1	0.05	9.16
Canadian	16	0.87	90.4
Chilean	9	0.49	90.89
Dutch	25	1.36	92.26
French	33	1.8	94.06
German	8	0.44	94.49
Greek	5	0.27	94.77
Indian	3	0.16	94.93
Irish	34	1.85	96.78
Italian	6	0.33	97.11
Kazakhstani	3	0.16	97.27
New Zealander	10	0.55	97.82
Norwegian	4	0.22	98.04
Pakistani	2	0.11	98.15
Russian	2	0.11	98.26
South African	16	0.87	99.13
Swedish	9	0.49	99.62
Swiss	6	0.33	99.95
UK	1,474	80.37	89.53
US	133	7.25	7.25
Ukrainian	1	0.05	100
Total	1,834	100	

B.2. By Region

Region	Freq.	Percent	Cum.
Africa	16	4.44	4.44
Asia	3	0.83	5.28
Europe	133	36.94	42.22
North America	149	41.39	83.61
Oceania	44	12.22	95.83
South America	9	2.50	98.33
Rest of the World	6	1.67	100
Total Foreign CEO	360	100	

Appendix C: Breakdown of Geographic Segments by Regions

All countries listed below are either emerging markets or developed markets according to S&P list, while all other countries are considered as rest of the world.

C.1. Breakdown of geographic segments by regions

Region	Countries
Asia	China, Hong Kong, India, Indonesia, Israel, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand
Europe	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, UK
North America	Canada, Mexico, US
Africa	Egypt, Morocco, South Africa
South America	Brazil, Chile, Columbia, Peru
Oceania	Australia, New Zealand
Rest of the world	All other countries

C.2. S&P list of developed and emerging markets

Region	Countries
Developed	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, the UK, and the US
Emerging markets	Brazil, Chile, China, Columbia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, Turkey