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Influence of CEO characteristics on short-term M&A performance

An event study on a sample of FTSE 100 companies

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Abstract

Title: Influence of CEO characteristics on short-term M&A performance – An event study on a sample of FTSE 100 companies

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Purpose: The purpose of this study is to determine specific CEO characteristics that influence short-term M&A performance. Based on these findings, the board of directors might be able to improve the accomplishment of its responsibilities.

Theoretical framework: The theoretical background covers the different views of value creation of M&As, the CEO's influence on corporate decision-making, the theory of agency costs, the theory of hubris and overconfidence and corporate governance based on previous literature and empirical findings.

Methodology: An event study approach is applied and OLS multivariate regressions are run. Short-term M&A performance is measured by the cumulative abnormal returns over a three-day-window around the acquisition announcement.

Empirical framework: The data sample consists of 164 M&As exercised by FTSE 100 companies between January 1st 2004 and December 31st 2013.

Conclusions: This research study confirms that CEO characteristics have a direct influence on short-term M&A performance. The cumulative abnormal returns of the 164 observed M&As indicate that on average the M&As fail to create substantial value for shareholders of the acquiring company. As the UK has one of the best corporate governance systems, the non-value creation of acquisitions might be explained by the overconfident behaviour of CEOs. Thus, the board of directors is recommended to adapt its abilities to counteract this overconfidence.

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Table of Contents

Abstract	i
Acknowledgements	ii
List of Figures	v
List of Tables	v
List of Appendices	v
List of Abbreviations	vi
1. Introduction	1
2. Theoretical and Empirical Background and Hypotheses Definition	4
2.1. Theoretical Framework	4
2.2. Value Creation of M&As	5
2.3. CEO Influence on Corporate Decision-Making	6
2.4. Theory of Agency Costs	7
2.5. Theory of Hubris and Overconfidence	9
2.6. Corporate Governance	12
2.6.1. Corporate Governance in the UK	12
2.6.2. Corporate Governance Mechanisms	13
2.7. Hypotheses	15
3. Methodology	19
3.1. Research Objective	19
3.2. Data Sample	19
3.3. Time Period	21
3.4. Data Collection	22
3.5. Event Study Methodology	23
3.5.1. Measurement of M&A Performance	23
3.5.2. (Cumulative) abnormal Returns	24
3.6. Variables	25
3.6.1. Dependent Variable	25
3.6.2. Independent Variables	26
3.6.3. Control Variables	27
3.7. Regression	30
	iii

3.7.1. Regression Design	30
3.7.2. Regression Assumptions	30
3.7.3. Further Robustness Tests	34
3.8 Validity and Limitations	35
4. Empirical Results	38
4.1. Descriptive Statistics	38
4.2. Regression Model	40
4.2.1. Multicollinearity	40
4.2.2. Multivariate Regressions	40
4.3. Robustness Tests	43
4.3.1. Exclusion of Outliers	44
4.3.2. Dependent Variable: <i>CAR5Day</i>	44
4.3.3. <i>Age</i> Groups and <i>CEOTenure</i> Groups	44
4.3.4. Period Sub-Samples: 2004-2007 and 2008-2013	45
5. Discussion	46
5.1. Age of the CEO	46
5.2. CEO Tenure	47
5.3. Tenure of the CEO within the Firm	48
5.4. CEO holding external Board Directorships	49
5.5. CEO having previous CEO Experience	50
5.6. CEO's Educational Background	50
5.7. CEO undertaking three or more Acquisitions	52
6. Conclusion	54
6.1. Implications for Corporate Governance	54
6.2. Further Research	55
7. References	57
8. Appendices	63

List of Figures

Figure 1: Conceptual framework

Figure 2: M&A activity worldwide and in Europe, 2000-2013

List of Tables

Table 1: Distribution of acquisition announcements between 2004 and 2013

Table 2: Distribution of CEOs by *Age* and *CEOTenure* groups

Table 3: Statistical measures for *CAR3day*, *Age*, *CEOTenure* and *FirmTenure*

Table 4: Distribution of observations for all dummy variables

Table 5: Multivariate regressions based on equations 1 and 2

Table 6: Robustness tests

List of Appendices

Appendix A: Valid M&A deals

Appendix B: Excluded companies

Appendix C: Excluded M&A deals

Appendix D: CEO characteristics

Appendix E: Correlation matrix

Appendix F: Descriptive statistics for control variables

Appendix G: Test for normality distribution of residuals

List of Abbreviations

AR	Abnormal return
CAR	Cumulative abnormal return
CEO	Chief Executive Officer
GBP	Pound sterling; British pound
FTSE 100	Financial Times Stock Exchange 100 share index
H.P.	Hewlett-Packard
LSE	London Stock Exchange
M	Million
M&A	Merger and Acquisitions
OLS	Ordinary least squares
ROA	Return on assets
UK	United Kingdom
US	United States
USD	United States dollar

1. Introduction

On 18th of August 2011, Hewlett-Packard (H.P.) signed a USD 11.1 billion contract to acquire Autonomy with the purpose to transform itself into an innovative software company generating high margins. At the acquisition's announcement day, Wall Street analysts described the deal as value destroying due to the fact that H.P., in their point of view, overpriced Autonomy's intrinsic value. And even though H.P.'s shareholders showed their disapproval regarding the acquisition already in advance, H.P.'s management still settled the deal (Stewart, 2012). As a consequence, H.P.'s share value has dropped by 60% in the years following the announcement and H.P.'s shareholders filed lawsuits against the company and its auditors (BBC, 2012). The example of H.P. illustrates how a company's management is able to pursue its own decisions disregarding shareholders' interest in important corporate decisions like Merger & Acquisitions (M&As).

In general, M&As represent an enormous business activity around the world. In 2013, 71,811 M&A deals took place with a total deal value of USD 3.45 trillion (Bureau van Dijk, 2014). Due to this large amount, M&A activities often play an important role in the performance of a company. In general, M&As are undertaken to achieve strategic development for the buyer and the target firm with the overall objective to create shareholder value (Caselli, Gatti and Visconti, 2006). Acquisition activities present the most popular method to achieve corporate growth and are supposed to create value for shareholders through the realisation of synergies (Gaughan, 2011; Sirower and O'Byrne, 1998).

Despite the large number of M&A deals, M&As are unique corporate investment decisions, demonstrated in several characteristics. First, the effect of M&As on shareholder wealth is directly assessed by markets after the announcement unlike, for instance, capital investments in property, plant and equipment (Sirower and O'Byrne, 1998). Second, acquisitions of public companies constitute an investment decision shareholders could easily make on their own by buying the target firm's shares. Third, an acquisition requires the payment of all costs upfront. Therefore, in order to create the expected value for the acquiring firm's shareholders, the combined performance gains must exceed the sum of the expected performance gains of the two stand-alone companies and the premium paid (Gaughan, 2011; Sirower and O'Byrne, 1998). However, the empirical evidence is conclusive that on average mergers¹ fail to achieve

¹ The terms 'M&A', 'mergers' and 'acquisitions' are used interchangeably in this study.

the goal of substantial value creation for acquirers' shareholders (Fung, Jo and Tsai, 2009; Doukas and Petmezas, 2007; Roll, 1986; Shefrin, 2005; Yim, 2013).

Due to the fact that takeovers can be seen as individual decisions, the psychological aspect of individual decision-making must not be neglected when looking for reasons for the non-value-creation of M&As (Roll, 1986). In other words, acquisition activities of companies are highly influenced by the actions and the perceptions of the firms' Chief Executive Officers (CEOs) (Graham, Harvey and Puri, 2013; Shefrin, 2005). Consequently, one can conclude that managerial motives rather than shareholder value maximisation motives might be inherent in acquisition activities (Shleifer and Vishny, 1997).

The study is based on the theoretical foundation of the theory of agency costs (Fung, Jo and Tsai, 2009; Gaughan 2011; Jensen, 1986; Jensen and Meckling, 1976; Odgen, Jen and O'Conner, 2002) and the behavioural finance theory of hubris and overconfidence (Doukas and Petmezas, 2007; Malmendier and Tate, 2005, 2008; Roll, 1986; Shefrin, 2005). These two main theoretical concepts represent the central foundations in explaining CEO's behaviour in corporate decision-making and its consequences for the firm. The theory of agency costs can thereby be based on the contractual view of firms where managers are hired as agents to act in the interest of shareholders, the principals. Due to imperfectly aligned contracts between agents and principals, managers are likely to pursue their own goals at the expense of shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). In contrast to agency theory, overconfidence implies that managers do not act consciously against shareholders' interests but that they destroy shareholder wealth by overestimating their ability to value target companies correctly (Malmendier and Tate, 2005; Shefrin, 2005). As a consequence, overconfident CEOs overpay for targets, known as hubris (Roll, 1986).

The Autonomy acquisition of H.P. illustrates how managers might be able to pursue their own decisions without taking the interest of their shareholders into account, resulting in a negative post-acquisition performance. As a contribution to the discussion of this corporate dilemma, the presented study determines specific characteristics that crucially impact M&A performance. Therefore, it can be valuable for the board of directors as well as for investors. First of all, the board of directors is able to adapt and improve its monitoring abilities by knowing which CEO characteristics affect M&A performance. Secondly, investors can assess how well the board represents their interests by preventing CEOs from undertaking value-destroying acquisitions.

Many previous researchers focus on individual CEO characteristics and their influence on M&A activities and M&A performance (Aktas, de Bodt and Roll, 2006; Ferris, Jayaraman and Sabherwal, 2013; Levi, Li and Zhang, 2010; Malmendier and Tate, 2005, 2008; Yim, 2013). However, the existing studies lack the following factors. First, previous studies mainly apply CEO characteristics as control variables or focus only on one characteristic (Lucey, Plaksina and Dowling, 2013; Malmendier and Tate, 2008; Yim, 2013). Therefore, the presented study analyses the combined impact of several CEO characteristics on short-term M&A performance. Second, most of the former studies focus on influences of CEO characteristics on M&A decisions in the United States (US) (Aktas, de Bodt and Roll, 2006; Fung, Jo and Tsai, 2009; Malmendier and Tate, 2005, 2008). Thereby, these studies neglect the European market as the second largest takeover market in the world (Wilmer Cutler Pickering Hale and Dorr LLP, 2013). Hence, this study aims to investigate the European takeover market focusing on the United Kingdom (UK). Third, the global financial crisis of 2007/ 2008 is not considered in most previous research studies. The research scope is limited to a time frame before the crisis and does not account for the possible impact the crisis might have on the extent the CEO characteristics affect M&A performance (Conn *et al.*, 2004; Ferris, Jayaraman, Sabherwal, 2013; Yim, 2013).

As a result, the objective of this research is to analyse the impact of certain CEO traits on short-term M&A performance as well as drawing implications for corporate governance in a European context, including the pre-and post-crisis time period. The study begins with a discussion of the most relevant theoretical foundations with respect to M&As, CEO characteristics and corporate governance, resulting in the definition of several hypotheses. The third part explains the applied event study methodology and multivariate regressions in order to test the defined hypotheses. Part four describes the empirical results gained from multivariate regressions. Based on these results, the impact and the significance of the different investigated CEO characteristics on short-term M&A performance is discussed. Finally, the conclusion presents implications of the results in a corporate governance context.

2. Theoretical and Empirical Background and Hypotheses Definition

In this chapter, the theoretical background for this study is presented and previous empirical findings are discussed. Based on the literature review, we define seven hypotheses that are investigated throughout this research study.

2.1. Theoretical Framework

In order to gain an overall perspective of the theoretical background of this research study and its linkages, the authors developed a conceptual framework as shown in figure 1.

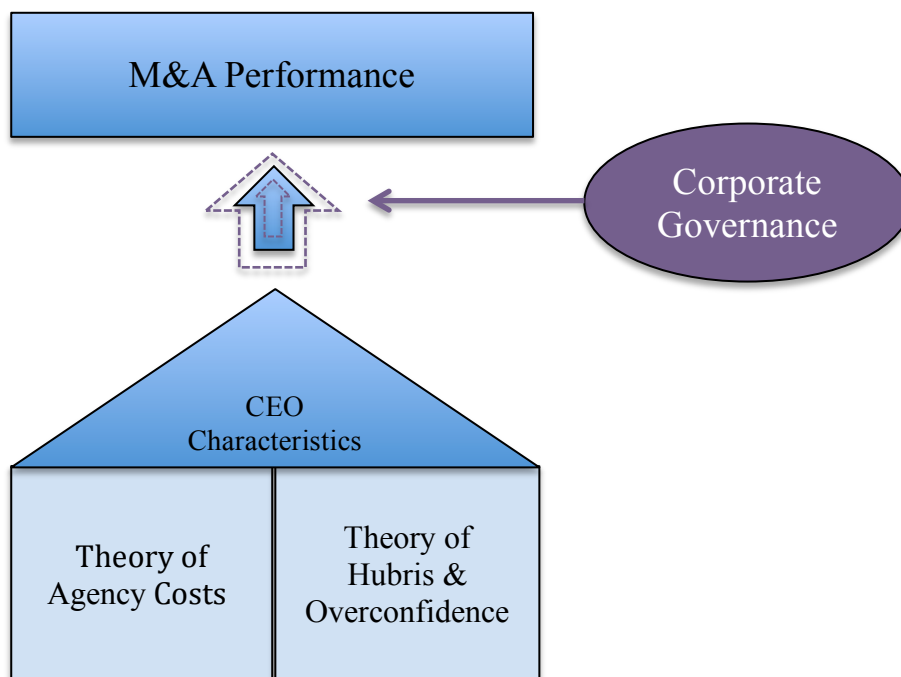


Figure 1: Conceptual framework (based on Bertrand and Schoar, 2003; Jensen, 1986; Jensen and Ruback, 1983; Roll, 1986; Tricker, 2012)

Due to the fact that individual managers often play a significant role in corporate decision-making processes (Bertrand and Schoar, 2003), CEOs are likely to crucially influence M&A activities and specifically, short-term M&A performance. First, we discuss different views on the value-creation of M&A activities. Afterwards, previous empirical research about the influence of CEO characteristics, on corporate decisions and performance, is reviewed in order to specify the CEO traits that might determine M&A performance. Third, the theory of agency costs and the behavioural finance theory of hubris and overconfidence are introduced as foundations in order to explain the impact of CEO characteristics. Finally, we emphasise that corporate governance systems determine to what extent the CEO characteristics affect

M&A performance, as illustrated in figure 1. Thereby, the importance of corporate governance for a company's performance is discussed by reviewing relevant corporate governance mechanisms.

2.2. Value Creation of M&As

M&As can be seen as a market control mechanism because companies where resources are not used in the most efficient way are likely to be acquired. This guarantees that major departures from maximisation of shareholder wealth are only temporarily and will be solved by the market and management teams competing for the rights to manage the company's resources (Jensen and Ruback, 1983; Masulis, Wang and Xie, 2007). Therefore, managerial actions, which are taken to decrease the probability of takeovers, such as adoption of antitakeover charter amendment, standstill agreements and targeted block repurchases, lead to negative abnormal stock returns (Gompers, Ishii and Metrick, 2003; Jensen and Ruback, 1983; Masulis, Wang and Xie, 2007; Shleifer and Vishny, 1997).

The sources to create takeover gains and to maximise shareholder value are various. First, acquisitions present a popular method to increase a firm's growth, especially in a mature industry (Sirower and O'Byrne, 1998). Besides, the acquirer believes in potential operational synergies with the target company that can be realised by a merger such as revenue enhancements, cost reduction, market power and know-how. Additionally, the purpose of a takeover can be to achieve financial synergies like coinsurance because the cash flows of the two merging companies are not perfectly correlated. Further financial synergies result, among others, from lower cost of capital and from higher tax shields (Gaughan, 2011; Schweiger and Very, 2003). The effect of coinsurance as a financial synergy is highest in diversifying mergers where the company acquires a target, which operates outside the company's industry. In contrast, operational synergies are mainly aimed for horizontal and vertical integrations (Schweiger and Very, 2003). The former refers to the acquisition of a rival whereas the latter implies a merger of companies with a buyer-seller relationship (Gaughan, 2011).

Whereas the consensus between researchers about the evidence of value creation for target firm's shareholders is strong (Doukas and Petmezas, 2007; Jensen and Ruback, 1983), there has been an on-going discussion about the value creation for shareholders of acquiring firms over the last decades. Asquith, Bruner and Mullins (1983) state that acquiring companies have significant abnormal returns for their first four merger announcements. Jensen and Ruback

(1983) conclude, after a detailed review of several empirical studies about the wealth effect of takeover activities, that bidding firms do not destroy shareholder value.

In contrast, Roll (1986) underlines that overall takeover gains for bidding companies have been overstated and that their existence is highly questionable. For instance, evidence is found that shareholders of acquiring companies experience a wealth loss of 10% over the five-year post-merger period (Agrawal, Jaffe and Mandelker, 1992). Moreover, cumulative abnormal returns (CARs) around the announcement of an acquisition decline from deal to deal, implying that the market perceives high acquisitiveness negatively (Aktas, de Bodt and Roll, 2006). Malmendier and Tate (2008) confirm this negative reaction and further emphasise that the average deal quality is lowered by high acquisition frequency. Thus, high acquisitiveness leads to lower announcement returns. Eckbo (2009), Roll (1986) as well as Sirover and O'Byrne (1998) underline that the payment of an acquisition premium sharply decreases the probability of creating shareholder wealth. The takeover premium is often related to the target's status (private or public). As private firms cannot be sold as easily on the market as shares, they are subject to the liquidity discount. Hence, the likelihood of paying high premiums decreases. Fuller, Netter and Stegemoller (2002) find evidence that bidder shareholders lose when their company buys public firms but they gain when the company buys a private firm or a subsidiary.

All in all, one can conclude that, on average, acquisitions do not create substantial value for acquirer's shareholders. Thus, additional factors, besides the inefficient use of companies' resources, have to be identified in order to explain the enormous execution of M&A deals around the world.

2.3. CEO Influence on Corporate Decision-Making

The choice and execution of different financing, investment and organisational strategies are highly dependent on the CEO of a firm. Particularly, those managerial impacts are significant in acquisition or diversification decisions as well as dividend policy, interest coverage and cost-cutting policies. As CEOs vary in their behaviour in regards to corporate decision-making across firms, the performance results differ as well (Bertrand and Schoar, 2003). Decisions made by managers are likely to have a large impact on the company's performance and profitability depending on their degree of influence on corporate decision-making. The more power a CEO has in this process, the less objective is his/ her judgement scope

regarding corporate decision-making. Nevertheless, centralised CEO decision-making across firms can lead either to superior performance or to weak performance. Less powerful CEOs, meaning that several top managers are involved in the decision-making process, cause more balanced and less extreme performance because the CEOs have to make compromises with other executives (Adams, Almeida and Ferreira, 2005). The influence of CEOs on a firm's performance and profitability is strengthened by previous research (Child, 1972; Hambrick and Mason, 1984; both cited in Adams, Almeida and Ferreira, 2005:1404).

Furthermore, several empirical studies investigate the influence of personality-level variables on corporate performance. A CEO's management talent and his/ her execution skills are positively related to firm performance (Kaplan, Klebanov and Sorensen, 2012). Besides, outside CEOs with previous CEO experience do not perform better on average than outside CEOs without previous experiences, although the market reacts more positively to the hiring of an outside ex-CEO (Elsaid, Wang and Davidson III, 2011). Focusing on the impact of CEO characteristics on its acquisitiveness, previous studies conclude that younger CEOs are more likely to frequently undertake acquisition activities due to stronger compensation incentives (Yim, 2013) and, with regards to male CEOs, due to their high testosterone level (Levi, Li and Zhang, 2010). Graham, Harvey and Puri (2013) investigate that a CEO's risk tolerance and optimism is positively related to his/ her acquisitiveness. Supporting these findings, Serfling (2014) underlines that older CEOs are more risk-averse and focus more on diversifying acquisitions than younger CEOs. In addition, Lucey, Plaksina and Dowling (2013) state that CEOs with a high ascribed and achieved social status are less likely to undertake acquisitions because CEOs become more risk-averse to protect their prestigious status.

As outlined above, CEOs have a large impact on important corporate decisions, especially in M&A decision-making processes (Bertrand and Schoar, 2003). As a result, a conflict of interest between CEOs and shareholders can arise if CEOs are not running the firms in a way to maximise shareholder value. It can be explained by the theory of agency costs and the behavioural finance theory of hubris and overconfidence (Jensen and Meckling, 1976; Roll, 1986).

2.4. Theory of Agency Costs

The agency cost theory emphasises the contractual view of the company defined as the relationship between the owners (principals) and the managers (agents) of the company. The

interest and rights of shareholders are represented by the board of directors that appoints managers to run the firm in a way that maximises shareholder value (Jensen and Meckling, 1976). Therefore, managers are required to execute corporate actions and decisions as agents of their shareholders, emphasising the separation of ownership and control. As shareholders provide the financing, they are owners of the company whereas managers possess control rights due to imperfectly aligned contracts and uninformed shareholders (Shleifer and Vishny, 1997). Managers often make decisions to benefit themselves at the expense of their shareholders. The costs associated with these actions are the monitoring and bonding costs of the agents by the board of directors as well as the residual loss resulting from CEO activities that are not in line with shareholder wealth maximisation (Fama and Jensen, 1983; Jensen and Meckling, 1976). Those agency costs related to acquisitions are further increased by specific firm characteristics such as the implementation of weak pay-for-performance arrangements (Yim, 2013), the availability of free cash flow (Jensen, 1986) and the existence of a weak and dependent board of directors (Adams, Almeida and Ferreira, 2005; Shleifer and Vishny, 1997). The latter is further discussed in the corporate governance section 2.6..

Considering the compensation factor, Fama and Jensen (1983) argue that the contractual structure of a company reduces the agent's risk-taking as they either receive a fixed payoff or an incentive payoff dependent on pre-defined performance goals. However, managers aim to decrease the riskiness of their income by executing, for instance a strategy of underemployment of debt, management entrenchment as well as excessive diversifying acquisitions. In addition, they increase their compensations by focusing on short-term value creation, by manipulating accounting earnings or by maximising firm size (Odgen, Jen and O'Conner, 2002). As CEO compensation is often related to the size of the firm and as acquisitions are generally awarded, regardless of their performance, the incentives for managers are high to pursue M&As even when they know that these acquisitions are most likely to destroy shareholder value (Yim, 2013). Moreover, the larger the size of a company, the better might be the reputation of its CEO. This problem of overinvestment is often called empire-building and is related to the agency cost theory of free cash flow (Jensen, 1986a, 1986b, 1988; cited in Mann and Sichertman, 1991:214).

This theory developed by Jensen (1986) refers to discretionary cash flow, which is available to CEOs in excess of what is required to finance all positive net present value investment projects. If the interests of CEOs and shareholders are perfectly matched, the excess available cash would be distributed to shareholders and hence, create maximum shareholder wealth.

Instead of distributing the additional cash to their shareholders, self-interested managers use the free cash flow for their own benefits (Jensen, 1986a, 1986b, 1988; cited in Mann and Sicherman, 1991:214).

In order to reduce the agency costs of free cash flow, Jensen (1986) suggests to increase the debt level of firms to constrain managers and to enhance monitoring by creditors. Additionally, Mann and Sicherman (1991) propose that shareholders should increasingly have the ability to oversee free cash flow directly. If shareholders are able to do so, agency costs will be reflected in lower share price, leading to a lower firm value. Besides, the board of directors should fulfil their responsibility to monitor the managers efficiently in order to settle the principal-agent problem. As the reputation of managers is established by, for example, the value maximising use of free cash flow in past acquisition activities, shareholders base their reaction to new acquisitions on CEO's previous value-creating decisions (John and Nachman, 1985; cited in Mann and Sicherman, 1991:214).

Nevertheless, problems associated with the principal-agent relation remain, as investors might not have access to all significant information related to important investment opportunities to identify and evaluate the aims pursued by CEOs. Even if all information was observable for them, investors would not have the guarantee that CEOs decide for projects with a positive net present value (Mann and Sicherman, 1991). Other criticism related to the agency theory is the narrow theoretical perspective as it focuses on the contractual relationship between shareholders and agents in order to explain the importance of corporate governance. Thus, it considers quantitative measures such as compensation aspects instead of taking interpersonal and group behavioural aspects of the board of directors into account. In addition, the theory assumes that all people are acting in self-interest without considering the interests of others. Hence, directors who are supposed to act in the interests of shareholders cannot always be assumed to fulfil their responsibilities (Tricker, 2012).

2.5. Theory of Hubris and Overconfidence

Besides the theory of agency costs, the behavioural aspects of hubris and overconfidence represent a theoretical foundation to explain CEO's behaviour in M&A decision-making.

The takeover market is often compared to an auction market where different management teams compete for the right to rule over the resources of a company (Jensen and Ruback,

1983). Since the highest bidder is most likely to win the auction, overconfident managers are willing to pay excessive premiums because they overestimate the value of the target company and potential synergy realisations. Overconfident managers “*view themselves as better than average*” in terms of their abilities and about their level of knowledge (Shefrin, 2005:6). As a result, mistakes occur more frequently than they expect (Shefrin, 2005).

Roll (1986) was the first to introduce the hubris theory that relates the phenomena of extensive takeover premiums to managers’ overconfidence. The hubris theory implies that CEOs of acquiring firms pay premiums for targets above the current market price by making their own valuation superior to the market valuation (Roll, 1986). In contrast to the theory of agency costs, the CEO does not necessarily act on purpose against shareholder interests. Hubris can also be caused when the CEO believes to act in the interest of shareholders but overestimates his/ her abilities to value the target correctly as well as the potential synergies of the acquisition. In addition, he/ she underestimates the risk associated with the acquisition (Malmendier and Tate, 2008; Shefrin, 2005). As a consequence, overconfident managers are more likely to pursue and complete acquisitions as well as engage in diversifying mergers compared to rational CEOs (Doukas and Petmezas, 2007; Shefrin, 2005). The empirical evidence suggests that overconfident CEOs materialise lower announcement returns and poor long-term performances compared to acquisitions undertaken by rational CEOs (Doukas and Petmezas, 2007; Kolasinski and Li, 2013). According to Malmendier and Tate (2008), the average short-term effect of acquisitions, announced by overconfident CEOs, on stock returns is -90 basis points compared to a negative return of -12 basis points for acquisitions announced by non-overconfident CEOs.

Malmendier and Tate (2005) underline three factors that can cause overconfidence: first, the illusion of control about the outcome of the action; second, a high degree of commitment to good outcomes due to a relation between good performance and personal wealth; and at last, an abstract reference point that complicates a rational assessment and comparison. The last factor is captured by Doukas and Petmezas (2007) who emphasise that overconfidence in acquisitions is even stronger for targets with limited disclosed information like private companies because managers are more prone to rely on their own assessment and beliefs. Besides, overconfidence is often accompanied by excessive optimism. Managers overestimate the possibility of experiencing favourable outcomes and underestimate the likelihood of facing unfavourable outcomes (Shefrin, 2005). Moreover, a CEO’s overconfidence might increase during his life due to the self-attribution bias. The bias describes the tendency of

CEOs to take the credit for successful acquisitions but to insist taking responsibility for failures, enhancing the confidence about their abilities over time (Doukas and Petmezas, 2007; Shefrin, 2005). The bias also corresponds to the ‘better-than-average’ effect, which describes that individuals believe they have superior abilities (Shefrin, 2005), and the ‘narrow confidence interval’ that implies that CEOs set the probability distribution for uncertain events like mergers too tight (Lichtenstein, Fischhoff and Phillips, 1982; cited in Doukas and Petmezas, 2007:537).

An important aspect of overconfidence implies that CEOs only overinvest if they have sufficient internal funds available. Due to the fact that they overvalue not only the target firm but also their own firm, overconfident CEOs are likely to perceive their firm as undervalued in the market. Therefore, they are reluctant to issue debt or equity securities and to pay the target with stock. Consequently, overconfident CEOs prefer all-cash payments (Doukas and Petmezas, 2007; Shefrin, 2005). The perception of the firm being undervalued in the market can also lead to the problem that overconfident CEOs forego positive net present value acquisitions because they perceive the financing as too costly (Malmendier and Tate, 2005, 2008). Nevertheless, overconfidence is sometimes assumed to create shareholder value since CEOs are, for instance, more willing to take debt and make use of tax shield advantages due to lower risk aversion (Shefrin, 2005). Furthermore, Kaplan, Klebanov and Sorensen (2012) emphasise that better overall performance of companies is positively related to a CEO’s resoluteness and overconfidence.

Ferris, Jayaraman and Sabherwal (2013) confirm the US-based findings of Malmendier and Tate (2005, 2008) for a global sample of companies by concluding that overconfidence is an international phenomenon. It can be extensively attributed to CEOs of firms headquartered in Christian countries. Barber and Odean (2001) investigate the influence of gender on overconfidence and conclude that men are more overconfident than women in a finance setting.

In previous research studies, different measures of CEO overconfidence have been developed. Malmendier and Tate (2005, 2008) identify CEOs as overconfident based on press coverage and extensive holdings of stock options.² In addition, CEOs are classified as overconfident when they pursue five or more acquisition within three years (Doukas and Petmezas, 2007). Kolasinski and Li (2013) define managers as overconfident when they purchase their own

² CEOs who extensively hold their options until expiration are called ‘longholders’.

firm's shares and earn a negative abnormal return over the next 180 days. Their study discovers that overconfident CEOs become less overconfident when they experience a personal loss on their stock trading.

Roll (1986) as well as Doukas and Petmezas (2007) argue against a learning effect from M&A experience due to the low frequency of M&As, compared to other investment decisions, and the self-attribution bias. In contrast, Aktas, de Bodt and Roll (2006) prove learning effects from prior acquisitions that have different consequences for the acquisitions undertaken by rational CEOs compared to the ones undertaken by hubris-infected³ CEOs. They conclude that rational CEOs develop a more aggressive bidding behaviour as a result of their experience from previous M&A activities. Hence, there is a declining trend in CARs from deal to deal. Additionally, the duration, defined as the time frame between successive deals, decreases as managers increasingly win auction processes due to their aggressive behaviour. In comparison, M&A deals undertaken by hubris-infected CEOs reveal a positive trend of CARs and in duration. As investors respond negatively to previous excessive M&A activities by overconfident CEOs, managers are required to become more cautious. Nonetheless, hubris-infected CEOs have on average a higher acquisition frequency and they learn at a slower pace than rational CEOs (Aktas, de Bodt, and Roll, 2006).

Due to the fact that overconfident managers suboptimally invest even when their interests are perfectly aligned to shareholders' interests and no information asymmetries exist, an active board of directors is required to monitor the M&A activities of CEOs and eventually constrain their use of internally generated funds (Malmendier and Tate, 2005). Furthermore, Kolasinski and Li (2013) underline that a strong and independent board of directors reduces the amount of mergers undertaken by overconfident CEOs. The importance of corporate governance mechanisms is further discussed in the next section, beginning with a presentation of the UK corporate governance system.

2.6. Corporate Governance

2.6.1. Corporate Governance in the UK

In 1992, the UK introduced the world's first corporate governance report, the Cadbury Report, and until now, it has released the most reports compared to any other country

³ Aktas, de Bodt and Roll (2006) use the term 'hubris-infected' as a proxy for overconfidence.

(Tricker, 2012). Moreover, the UK is considered to have one of the best corporate governance systems globally (Shleifer and Vishny, 1997).

The corporate governance model of the UK and Commonwealth is based on common law and it follows a ‘comply or explain’ approach to corporate governance (La Porta *et al.*, 1998; Tricker, 2012). Companies can either state that they adhere to the codes of corporate governance principles and good practice or they have to explain why they do not. Therefore, the UK/ Commonwealth model is often defined as principles-based model. In contrast, the American model incorporates the codes of corporate governance in their law. Nevertheless, as companies in the UK mainly apply international accounting standards, the compliance with corporate governance principles is enhanced. The codes emphasise a high degree of transparency and accountability towards shareholders and the public (Tricker, 2012). This signifies that the interest of managers and shareholders are better aligned and that the board of directors follows more efficient monitoring practices (Rani, Yadav and Jain, 2013).

The codes of corporate governance further imply, in particular for listed companies, to have non-executive directors on the board and to divide board responsibilities throughout board committees. In contrast to the common presence of CEO duality in the US, the roles of the chairman and the CEO are separated in the UK. Compared to European civil law countries such as France or the Netherlands, the ownership of UK companies is highly dispersed among individuals and institutional investors. Hence, M&As are more likely to be undertaken, as bidders do not have to deal with a dominant shareholder such as the government or a financial institution, indicating a strong market for corporate control (Tricker, 2012). Nevertheless, according to La Porta *et al.* (1998), the strongest protection of shareholder rights is guaranteed in common law countries and in companies with a low ownership concentration.

2.6.2. Corporate Governance Mechanisms

The outlined theories of agency costs as well as hubris and overconfidence indicate that CEO characteristics can essentially influence corporate decision-making, in particular in M&A deals. All corporate decisions are subject to corporate governance reflecting whether shareholder value maximisation as the primary goal is guaranteed while CEOs are pursuing M&As. Therefore, the board of directors plays an important role because it selects the manager to run the company’s operations and it monitors the CEO’s actions and performance. Additionally, it advises and assists in important strategic decisions (Adams, Hermalin and Weisbach, 2010). Consequently, the board also carries the responsibility for the execution of

M&A deals. It has to ensure that it fulfils on the one hand its performance role, strategy formulation and policymaking, and on the other hand its conformance role of executive supervision and accountability towards the firm's shareholders and the public (Tricker, 2012). Hence, the corporate board is an important corporate governance mechanism combining expertise, independence and legal power (Byrd and Hickman, 1992).

All directors have to represent the common duty of trust and care, regardless of their classification as executive or non-executive directors.⁴ The director's duty of trust is about to act with integrity and honesty to represent all shareholder interests and the latter implies to exercise an independent, objective judgement in corporate decision-making. Executive directors hold an executive management position within the company whereas non-executive directors are not part of the executive management. Non-executive directors can be further distinguished by being independent according to the corporate governance code or of being to some extent connected or affiliated to the company (Tricker, 2012). Affiliated non-executive directors are for instance a former CEO of the company, a director in the supplying firm or a family member of the CEO or chairman (Byrd and Hickman, 1992; Tricker, 2012).

Even though inside directors within the corporate board mainly have viable knowledge about the company itself and its activities, the presence of outside directors in the board of directors demonstrate independence, expertise and objectivity (Byrd and Hickman, 1992). As a result, the monitoring of managers by outside directors accounts for a very important function of the board (Winter, 1977; cited in Byrd and Hickman, 1992:196). Focusing on the M&A process, outside directors evaluate in particular the management's acquisition proposal (Koontz, 1976; Weiss, 1991; both cited in Byrd and Hickman, 1992:196) and monitor the whole acquisition process. They ensure that managers take actions without harming the firm's shareholders by following its own empire-building goals (Bacon, 1985; cited in Byrd and Hickman, 1992:197; Byrd and Hickman, 1992). In addition, they can assess the benefits and costs of an acquisition more objectively and in some cases, they have a better knowledge of the target firm and the industry it is operating in. As a result, the average abnormal announcement-day return follows a less negative trend for companies with a board consisting of more than 50% of outside directors (Byrd and Hickman, 1992). Moreover, an independent board is also more likely to replace CEOs that are pursuing value-destroying M&As at the expense of their shareholders (Kolasinski and Li, 2013; Lehn and Zhao, 2006). Nevertheless, shareholder interests are not

⁴ The terms 'non-executive directors' and 'outside directors' as well as the terms 'executive directors' and 'inside directors' are used interchangeably in this study.

represented and protected effectively enough if the board includes only outside directors as inside directors contribute viable firm-specific knowledge (Byrd and Hickman, 1992).

Besides the importance of an efficient board of directors, other corporate governance mechanisms can impact the CEO's role in M&A deals and ensure a value-creating M&A performance. Acquiring firms that separate the role of the CEO and chairman experience higher abnormal announcement returns as this corporate governance mechanism, the elimination of 'CEO duality', emphasises the independence and objectivity of the board in its duty to monitor the CEO (Masulis, Wang and Xie, 2007; Tricker, 2012). According to Rani, Yadav and Jain (2013), a weak corporate governance system indicates a low degree of operational and financial transparency leading to a high level of information asymmetry between shareholders and managers. In contrast, companies with a more effective corporate governance system are associated with better monitoring procedures and thus lower agency costs. Rani, Yadav and Jain (2013) conclude that acquiring firms having such a governance system experience higher stock returns around the acquisition announcement.

2.7. Hypotheses

Based on the theoretical background and empirical findings outlined above, we define seven hypotheses to investigate which CEO characteristics have a crucial influence on short-term M&A performance. Thereby, each hypothesis represents a certain CEO characteristic.

Previous studies have confirmed that corporate decision-making such as M&As can be affected by the age of a CEO indicating on the one side experience and on the other side improved perception (Graham, Harvey and Puri, 2013). Previous studies have used age as an indicator to measure personal risk-aversion, which increases the older the CEO gets (Shefrin, 2005; cited in Graham, Harvey and Puri, 2013:107). Due to the fact, that older CEOs become more cautious, overconfidence decreases with age. Consequently, the CEO pursues fewer acquisition activities (Ferris, Jayaraman and Sabherwal, 2013; Yim, 2013). Hence, our first hypothesis states following:

H1: The acquisition undertaken by a young CEO has a weaker short-term M&A performance than the acquisition undertaken by an older CEO.

According to Fung, Jo and Tsai (2009), a long CEO tenure is regarded as an indicator for experience and so CEOs with a shorter tenure tend to engage more in value-destroying M&A activities due to a lack of sufficient experience. Additionally, CEO tenure can be perceived as an indicator for knowledge development (Adams, Almeida and Ferreira, 2005). As inside directors possess valuable knowledge and expertise about the company (Byrd and Hickman, 1992; Tricker, 2012), it can be assumed that the longer the CEO is within the board, as executive director, he/ she is able to exercise well-founded decisions. Therefore, we assume in our second hypothesis:

H2: The acquisition undertaken by a long-tenured CEO has a stronger short-term M&A performance than the acquisition undertaken by a short-tenured CEO.

Whereas the second hypothesis focuses on the manager's tenure as CEO in the current company, the following hypothesis considers the entire time period the manager has worked for this company, taking into account the possible time before he/ she was appointed as CEO. In accordance with the argumentation of the second hypothesis, the overall firm tenure of the CEO is also regarded as a factor of experience, commitment and knowledge enhancement resulting in the third hypothesis:

H3: The acquisition undertaken by a long-firm-tenured CEO has a stronger short-term M&A performance than the acquisition undertaken by a short-firm-tenured CEO.

CEOs of acquiring companies holding non-executive directorships have to provide the board with an independent and objective point of view when it comes to corporate decision-making such as M&As (Byrd and Hickman, 1992). Directors are required to fulfil the independence criteria according to the codes of good practice in corporate governance. Additionally, outside directors have to fulfil conformance-orientated roles such as exercising independent judgement and monitoring of CEO's actions in another company (Tricker, 2012). Hence, we conclude that he/ she applies this role as well in the own firm by incorporating a well-founded decision-making process. As a result, our fourth hypothesis indicates following:

H4: The acquisition undertaken by a CEO holding a board position within another company has a stronger short-term M&A performance than the acquisition undertaken by a CEO without holding an outside directorship.

Whereas hypothesis 2 and hypothesis 3 regard experience and knowledge as performance enhancing, hypothesis 5 and hypotheses 6a and 6b are built on the theory of overconfidence.

Focusing on CEOs having CEO experience in previous companies, the self-attribution bias is considered to be one of the main causes of overconfidence. Thereby, CEOs are likely to take the credit for the success of companies where they have been CEO. Previous studies confirm that overconfident CEOs tend to pursue more M&As that result in lower abnormal returns compared the ones of rational CEOs (Doukas and Petmezas, 2007). Since CEOs with previous CEO experience are assumed to behave more overconfident in corporate decisions than the ones without any previous CEO experience, we state the following hypothesis:

H5: The acquisition undertaken by a CEO having CEO experience in previous companies has a weaker short-term M&A performance than the acquisition undertaken by a CEO without previous CEO experience.

Building on the overconfidence theory, CEOs having degrees in the field of business as well as science are likely to believe that they have superior knowledge and abilities compared to other managers, also known as ‘better-than-average’ effect (Shefrin, 2005). As mentioned above, M&As that are pursued by overconfident CEOs have lower abnormal stock returns (Malmendier and Tate, 2008). In addition, we follow Malmendier and Tate (2008) assuming that business education increases the acquisition activities of a CEO. Thus, it lowers the average deal quality and the announcement returns. This is reflected in the following hypotheses:

H6a: The acquisition undertaken by a CEO having a business and technical education background has a weaker short-term M&A performance than the acquisition undertaken by a CEO who has education in only one study field.

H6b: The acquisition undertaken by a CEO having a business education is assumed to have a weaker short-term M&A performance than the acquisition undertaken by a CEO with a technical background.

Based on the research of Doukas and Petmezas (2007), CEOs are categorised as being overconfident if they execute five or more acquisitions within a three-year period, resulting in low returns for the company and its shareholders. By overestimating their own ability and know-how, they assume to act in their shareholders’ interest by executing several M&As within a short period of time (Malmendier and Tate, 2008; Roll, 1986). We aim to verify the negative effect of high acquisitiveness by testing the following hypothesis:

H7: The acquisition undertaken by a CEO representing at least his/ her third acquisition in the sample period has a weaker short-term M&A performance than the first or second acquisition undertaken by this CEO.

The verification of the above hypotheses is tested through multivariate regressions in order to gain insights regarding the influence of CEO characteristics on short-term M&A performance. The empirical research approach is presented in detail in the following methodology chapter.

3. Methodology

The third chapter outlines the research approach of this study. The process of data collection and sample development as well as the variables used for the multivariate regressions are defined. In addition, the regression models and employed robustness tests are explained.

3.1. Research Objective

The objective of this research study is to identify and analyse how different CEO characteristics can influence short-term M&A performance. In particular, personal aspects in regards to M&A decisions are examined within a European setting, covering the time period from 2004 until 2013. The defined hypotheses, based on previous empirical research studies, are tested by conducting multivariate regression analyses. As a result, we can conclude which CEO characteristics have a crucial influence on short-term M&A performance and what kind of implications can be drawn for corporate governance.

3.2. Data Sample

The UK plays a major role in the European M&A market. In 2013, the deals by value and the transactions by volume represented 24% and 22% in the European area respectively (CMS, 2013). It has been the second biggest target by volume in 2013 after the US (Bureau van Dijk, 2014). Overall, the UK is the most M&A active country in Europe, by value and by volume (CMS, 2013). Hence, the research scope for this study focuses on acquisition announcements of companies of the Financial Times Stock Exchange 100 share index (FTSE 100)⁵ in the UK within the ten-year time period from 2004 to 2013. The focus is set on FTSE 100 companies which act as a buyer in an M&A transaction.

In order to derive the final sample, the following criteria for acquisitions and companies are used:

1. The buying company is a (parent) company listed on the London Stock Exchange (LSE). M&A deals of subsidiaries are excluded since they are often executed by their own CEOs. As a substantial contribution by the parent companies' CEOs is not involved, those deals are not representative for this study scope.

⁵ The FTSE 100 index represents the share performance of the 100 most actively traded and largest firms on the London Stock Exchange (Financial Times, 2014). The constituents of the FTSE 100 index are taken from Reuters as of April 2014 (Reuters, 2014) in order to derive our data sample.

2. The company announced the acquisition between January 1st 2004 and December 31st 2013. The deal is closed until December 31st 2013.
3. The acquirer's return data over a three-day window around the announcement date is available at *Thomson Reuters Datastream*.
4. Following Malmendier and Tate (2008), the research data is limited to transactions whereby the acquiring firm gains a majority stake in the target firm, an equity stake of at least 51%, resulting in a change of control. It implies that the toehold of the company before the acquisition is less than 50%.
5. Information about the transaction value must be disclosed to assure that the acquisition can be considered as significant for financial reporting purposes (Conn *et al.*, 2004; Kolasinski and Li, 2013).
6. Following Doukas and Petmezas (2007) and Masulis, Wang and Xi (2007), the deal size is required to present at least 1% of the acquirer's market value, measured at the last fiscal year end prior to the acquisition's announcement. The requirement is necessary to specify the deals where the CEO has substantial influence on the activity.⁶
7. Financial institutions like banks, insurance companies, investment funds, venture capital firms and property development and investment firms are excluded from the sample. The financial institutions have been excluded in previous studies (for example Doukas and Petmezas, 2007; Fama and French, 1992; Fung, Jo and Tsai, 2009) due to their common high leverage ratio which does not imply the same meaning of financial distress as for nonfinancial firms. In addition, the high regulation standards of financial institutions limit the power of CEO to pursue acquisitions. Besides, investment funds, venture capital firms and property development and investment firms are excluded because acquisitions present a substantial part of their business activities (Lucey, Plaksina and Dowling, 2013).

⁶ *Thomson Reuters Eikon* delivers the deal value for each M&A in USD. As all of the other financial data used in this research study is denoted in GBP, the USD deal value is converted at the GBP/ USD exchange rate of the announcement day in order to gain the GBP value of each M&A deal. The exchange rate is derived from *Thomson Reuters Datastream* respectively.

8. No distinction is made between domestic and cross-border acquisitions as well as between diversifying and non-diversifying M&A deals.

As a result of the application of the above restrictions, we gain a sample of 164 valid M&A deals undertaken by 56 FTSE companies, which can be found in appendix A. The companies and the M&As that have been excluded because they do not fulfil the defined criteria are illustrated in appendix B and appendix C respectively.

3.3. Time Period

In order to analyse the influence of CEO characteristics on a significant amount of M&A announcements, a time period of ten years has been chosen starting on January 1st 2004 and ending on December 31st 2013. As the global financial crisis of 2007 impacted the number and value of M&As in the subsequent years, as shown in figure 2, a pre- and post crisis time frame is taken into account to avoid a distortion of results.

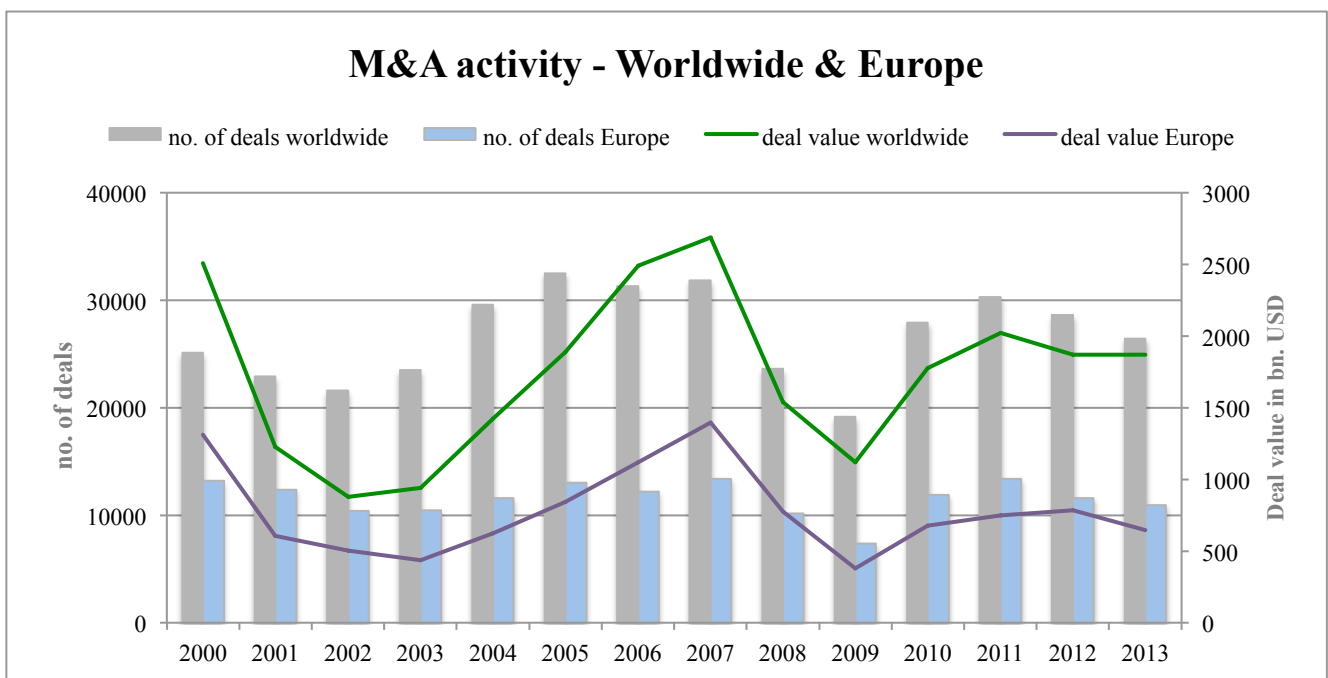


Figure 2: M&A activity worldwide and in Europe, 2000-2013, adapted from Wilmer Cutler Pickering Hale and Dorr LLP (2013:2,3)

Even though the sixth merger wave started, according to the literature, in 2003 (Alexandridis, Mavrovitis and Travlos, 2012; Kummer and Steger, 2008), the M&A demand grew significantly in 2004. The increase was driven the demand of private equity firms that benefited from the low interest rate environment and the growing capital and real estate

markets (Gaughan, 2011). According to Kengelbach and Ross (2011), the M&A boom of this wave took place between 2004 and 2008. Moreover, the worldwide M&A activity, as illustrated in figure 2, started slowly to increase again by 2003 after the economic downturn of 2001 (Gaughan, 2011) whereas the number of deals and the total deal volume in Europe began to rise in 2004 (Wilmer Cutler Pickering Hale and Dorr LLP, 2013). As this research study focuses on M&A activities by companies listed on the LSE, the European M&A development is taken as benchmark to define the beginning of the considered time period as of 2004.

3.4. Data Collection

Based on Saunders, Lewis and Thornhill (2009), data in research studies can be categorised as primary and secondary data as well as quantitative and qualitative data. Our research study covers secondary data such as books, journals, articles and organisation's databases since the obtained data has been already observed and interpreted for other purposes. The use and further interpretation of secondary data increases the amount of data available for our research. In contrast, primary data implies that data is collected in particular for a specific research project by conducting interviews, questionnaires or observations, which is not subject to our study purpose. Additionally, our secondary data can be categorised as quantitative and qualitative data. The former represents numerical data obtained by data collection procedures whereas the latter is defined as non-numeric and non-standardised data. For this study, both methods are applied and equally important. We classify the qualitative data into different categories in order to conduct an empirical analysis of the defined hypotheses (Saunders, Lewis and Thornhill, 2009).

All required data, except the data about the CEO characteristics, is obtained by the databases provided by LINC finance lab at the Lund University, School of Economics and Management. To minimise the potential error resulting from using three different databases for the sample, we consistently use one database within the different group of variables:

- *Thomson Reuters Eikon* is used to obtain our M&A deal sample within the ten-year time period of 2004 until 2013 according to the defined requirements outlined above. The deal-specific control variables are derived from the M&A sample.

- *S&P Capital IQ* provides the data for gaining the firm-specific control variables for each company in the sample due to the fact that the necessary information was not completely available at *Thomson Reuters Eikon*. All variables are measured at fiscal year end prior to the acquisition announcement.
- *Thomson Reuters Datastream* is used in order to gain the acquirer's return data over a three-day window around the acquisition announcement date and the market returns for the FTSE-All Share Index.

Regarding the data collection for the considered CEO characteristics, the information is derived from financial market data platforms like *Reuters* or *Bloomberg Businessweek* and the annual reports of the firms. Our sample consists of 75 CEOs that are presented in appendix D.

3.5. Event Study Methodology

As this study aims to identify how CEO characteristics have an impact on M&A performance, the event study methodology approach is applied. By implying financial market data, event studies examine how a certain event such as an acquisition, the issuance of new debt or an earning announcement can influence a company's value and thus, shareholder wealth. (Khotari and Warner, 2006; MacKinlay, 1997). The event study method is based on the theory of an efficient and rational market, developed by Fama (1970). Therefore, the event's impact on the company is directly reflected in its stock returns (MacKinlay, 1997).

3.5.1. Measurement of M&A Performance

Different approaches to measure M&A performance by using the event study methodology can be considered. The short-term window event study method has been mostly conducted in previous empirical studies to assess the value creation of acquisitions (Asquith, Bruner and Mullins, 1983; Fuller, Netter and Stegemoller, 2002; Kolasinski and Li, 2013; Masulis, Wang and Xie, 2007). Other possible measures include long-term abnormal stock returns, long-term accounting measures as well as subjective performance measures as synergy realisation, integration process performance and employee retention (Zollo and Meier, 2008).

Contrary to Zollo and Meier (2008), Sirower and O'Byrne (1998:108) find that short-term abnormal stock returns after an announcement of an acquisition are highly correlated with long-term stock performance and their measure of post-acquisition operating performance. In

contrast, Zollo and Meier (2008) state that stock returns only show the market expectation about firm performance. The appropriateness of short-term window event studies as a proxy for M&A performance is still discussed among researchers. According to Sirower and O’Byrne (1998), study findings indicate that the market’s response to an acquisition announcement yields an unprejudiced forecast of the acquisition’s long-term impact and thus, it signifies M&A performance.

3.5.2. (Cumulative) abnormal Returns

In order to measure the performance of each valid M&A of our research sample, the cumulative abnormal returns (CARs) observed around the acquisition announcement date are calculated. Therefore, the standard event study methodology by Brown and Warner (1985) is applied.

Day ‘0’ is defined as the event day, the date of the acquisition announcement, and the ‘event period’ is the three-day period (-1, +1) around the announcement date (Baker *et al.*, 2012; Conn *et al.*, 2004; Moeller, Schlingemann and Stulz, 2005). Compared to monthly return data, daily return data measures abnormal returns more accurately enabling a better, informative identification of announcement effects, according to Khotari and Warner (1997). To calculate the daily abnormal return (AR), different models can be applied such as the mean-adjusted return model, the capital asset pricing model (CAPM), the market model or the market-adjusted model (Brown and Warner, 1985; Khotari and Warner, 2006; MacKinlay, 1997).

In this research study, we deploy the market-adjusted model, following previous research studies (Aktas, Bodt and Roll, 2006; Conn *et al.*, 2004; Doukas and Petmezas, 2007; Fuller, Netter and Stegemoeller, 2002;). MacKinlay (1997) argues that the market model is a better approach in order to identify and to analyse event effects on stock returns as the market-adjusted model can imply biases due to limited data availability. However, according to Fuller, Netter and Stegemoeller (2002), the market-adjusted model can be applied because an estimation of the market parameters, prior the event day, is unreliable if companies acquire frequently. Hence, their takeover efforts would be included in the estimation period. Therefore, the market-adjusted model does not estimate the market-model parameters and so the inclusion of an estimation period is not required.⁷ Besides, Sirower and O’Byrne (1998) as

⁷ For the market-adjusted model, the formula of the market model is applied: $A_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{m,t}$. As market parameters are not estimated by running regressions over an estimation period, α is set to 0 and β to 1.

well as Malmendier and Tate (2008) find similar results for the market-model and the market-adjusted model.⁸

The daily abnormal return over the three-day event window is calculated by using following formula, derived from Brown and Warner (1985):

$$A_{i,t} = R_{i,t} - R_{m,t}$$

By subtracting the normal expected returns ' $R_{m,t}$ ', determined by the FTSE All-Share Index, of the actual returns ' $R_{i,t}$ ' of the company 'i', the daily abnormal returns ' $A_{i,t}$ ' are obtained. The normal expected return ' $R_{m,t}$ ' implies the return in case the event would not have taken place (MacKinlay, 1997). In line with Doukas and Petmezas (2007), the FTSE All-Share index as benchmark for the normal expected return has been applied.

The CAR for each M&A is the sum of the calculated abnormal returns over the three-day event window applying following formula (Khotari and Warner, 2006; MacKinlay, 1997):

$$CAR_i(t_{-1}, t_{+1}) = \sum_{t=t_{-1}}^{t_{+1}} A_{i,t}$$

3.6. Variables

3.6.1. Dependent Variable

According to Brooks (2008), the dependent variable is influenced by explanatory variables and hence, changes in these variables can explain movements in the dependent variable.

In this research study, the dependent variable is the CAR over a three-day event window around the acquisition announcement date, *CAR3Day*, which is calculated by using the event study methodology outlined above. CAR is used as stock returns reflect how events, like the announcement of an M&A, can impact a company's shareholder value under the assumption of a rational market place (Khotari and Warner, 2006). Hence, it provides evidence whether M&As create or destroy shareholder value. Finally, we follow previous studies that use CAR as a dependent variable in order to test and to evaluate how different CEO traits as well as

⁸ Conn *et al.* (2004) used alternative models to obtain abnormal returns by using a CAPM and a mean-adjusted model following, Brown and Warner (1985), in order to test the robustness of their results. The results of the market-adjusted and the alternative models were very similar.

deal characteristics and firm factors impact the short- and long-run performance of a company (Aktas, de Bodt and Roll., 2006; Conn *et al.*, 2004; Moeller, Schlingemann and Stulz, 2005).

3.6.2 Independent Variables

Independent variables are considered in a regression model in order to explain how variations in their values explain changes in the regressand (Brooks, 2008). Each explanatory variable represents one of the hypotheses described in section 2.7..

The first considered explanatory variable of interest represents the age of the CEO at the announcement date of the acquisition. Following previous studies, we apply *Age* as a linear variable as well as by grouping it into differently defined categories like ‘young’, ‘medium’ and ‘old’ (Yim, 2013) or ‘five-year age groups’ (Levi, Li and Zhang, 2010). Thereby, we control for the potential linear relationship between age and tenure. Hypothesis 1 implicates that younger CEOs have weaker short-term M&A performance. Hence, the variable *Age* positively affects the CARs around the announcement day.

CEOTenure is measured as the number of years the CEO holds his/ her position in the company until the announcement of an M&A. Yim (2013) uses tenure as a control variable to explain the degree of power of CEOs while Adams, Almeida and Ferreira (2005) include the variable in order to control for knowledge development and enhancement. For this research, tenure is defined as a measure for the CEO’s commitment to the firm and as a signal for experience, following Fung, Jo and Tsai (2009). As a result, our hypothesis signifies that the variable *CEOTenure* has a positive coefficient value.

In addition to the CEO’s tenure, this study is the first, according to our knowledge, to include the overall tenure of the CEO within the firm as a variable of interest in order to measure experience, commitment and knowledge development. The overall tenure represents the time period the current CEO is connected to the company, i.e. also as non-executive director prior to his/ her appointment as CEO.⁹ Our hypothesis implies a positive effect the variable *FirmTenure* on the CARs around the acquisition announcement day.

The board positions of a CEO in other companies are included as a dummy variable. The variable takes the value of 1 if the CEO has a board position in another firm and the value of 0 if he/ she has not. Outside directorship as an independent variable has been studied by Byrd

⁹ The years of the CEO being with another company, that got acquired at a later stage by one of the sample companies, are not included in the calculation of the CEO tenure as well as firm tenure.

and Hickman (1992) in terms of directors holding several external directorships. In line with the fourth hypothesis, we measure the impact of CEOs holding outside board positions as a sign of independent judgement and better corporate decision-making. Hence, the *BoardOutside* variable is expected to have a positive coefficient value.

Previous CEO experience is measured as a dummy variable taking the value of 1 if a CEO has previous CEO experience in another company; otherwise it takes the value of 0. In accordance to our fifth hypothesis, we assume that CEOs with previous CEO experience are executing more overconfident behaviour than CEOs without previous CEO experience. Therefore, there is a negative relationship between the variable *Experience* and the CAR around the acquisition announcement day.

The *EducationBT* dummy variable takes the value of 1 if the CEO has a business and a technical educational background.¹⁰ The dummy variable carries the value of 0 if the CEO has not both educational backgrounds. Based on hypothesis 6a, we assume a negative coefficient for *EducationBT*. In addition, we include the dummy variables *BusinessOnly* and *TechnicalOnly* that take the value of 1 if the CEO has only a business or only a technical background respectively; otherwise the variables take the value of 0. The variables are included to see whether business education has a negative influence on *CAR3Day*, stated in hypothesis 6b. The technical education background is chosen as comparison because most of our sample companies operate in a scientific industry.

Finally, *ThreeOrMore* indicates whether one CEO has executed three or more acquisitions in the ten-year sample period. The dummy variable holds the value of 1 if the same CEO has pursued three or more acquisitions and the value of 0 if he/ she has undertaken one or two acquisitions. As this variable can be defined as a proxy for high acquisitiveness of CEOs, as stated in hypothesis 7, we assume that the variable *ThreeOrMore* negatively impacts the CAR around the announcement day.

3.6.3. Control Variables

Firm- and deal-specific variables are included as control variables to capture the effect of different characteristics of the acquirers as well as the M&A deals on the market's response to

¹⁰ Following Malmendier and Tate (2008), a CEO has a business education if he/ she holds an undergraduate or graduate degree (including MBA) in accounting, business, finance or economics. A CEO has a technical education if he/ she holds an undergraduate or graduate degree in engineering, chemistry, physics, biology, geology, medicine, pharmacy or other applied sciences.

acquisition announcements. For the firm-specific variables, data of the acquirer's latest annual report of the fiscal year prior the acquisition announcement has been used (Baker *et al.*, 2012; Masulis, Wang and Xie, 2007). The following variables are chosen, based on previous empirical research studying M&As and their definition of firm- and deal-specific control variables.

- *FirstDeal* indicates if an undertaken M&A is the first deal performed by a CEO. We control for this variable as first deals can result in higher abnormal returns around the acquisition announcement day than successive deals, according to Doukas and Petmezas (2007).
- *DealSize* is defined as the total transaction value in millions of GBP paid by the acquirer for the target firm. It is included in order to control for the impact of a deal-specific variable on the abnormal stock returns around the acquisition announcement day (Aktas, de Bodt and Roll, 2006; Baker *et al.*, 2012; Moeller, Schlingemann and Stulz, 2005).
- *Assets* are the total assets stated on the company's balance sheet and the variable is included in order to control for firm size (Ferris, Jayaram and Sabherwal, 2013; Yim, 2013). According to Ferris, Jayaram and Sabherwal (2013), firm size has a positive and statistically significant effect on the CEO's offer behaviour.
- Market capitalisation, *MarketCap*, is derived by multiplying the company's ordinary shares outstanding by the ordinary share price representing the acquirer's total market value of equity in millions of GBP (Baker *et al.*, 2012).
- *Q* is defined as the ratio of the market value of assets over the book value of assets in order to control for the investment opportunities of the acquiring firm (Ferris, Jayaram and Sabherwal, 2013). According to Masulis, Wang and Xie (2007), *Q* has a negative effect on the acquirer's return.
- Return on assets (ROA)¹¹ is included as the firm-specific control variable *ROA* defined as the profit generated by the firm in relation to its asset base. It is included as a measure to control for the acquiring firm's operating performance (Serfling, 2014; Yim, 2013).

¹¹ *S&P Capital IQ* defines ROA as following: $ROA = (EBIT * 0.625) / ((Total Assets_t + Total Assets_{t-1}) / 2)$.

- Operating cash flow¹², *OpCF*, represents the available internal resources in order to finance a firm's investments like acquisitions (Ferris, Jayaraman and Sabherwal, 2013). Besides the empire-building motives of CEOs associated with free cash flows, a high amount of cash flow might also indicate the well-performing status of a company due to the CEOs ability to execute better acquisitions according to Masulis, Wang and Xie (2007).
- Capital Expenditures, *CapEx*, represents a company's investment activity and is defined as cash expenditures on tangible fixed assets representing cash outflows in regards to the purchase of property, plant and equipment (Ferris, Jayaraman and Sabherwal, 2013; Malmendier and Tate, 2008; Yim, 2013).
- The variable *Solvency* represents the long-term solvency of a firm and it is measured as total debt divided by total capital.¹³ A higher leverage of the acquirer can reduce the CEO's ability to pursue empire-building as financial institutions also control and monitor the actions of CEOs (Baker *et al.*, 2012). In addition, leverage represents a corporate governance mechanism as future free cash flow is limited. Thus, it reduces the CEO's ability to use it in order to pursue their own benefits, according to Masulis, Wang and Xie (2007). They conclude that leverage can play a pivotal role in preventing CEOs to pursue value-destroying acquisitions.
- Operating income¹⁴, *OpInc*, is included as a firm-specific variable to control for the influence of a firm's operating performance on the abnormal stock returns around the acquisition announcement day (Ferris, Jayaraman and Sabherwal, 2013).

Except for *FirstDeal*, *Q*, *ROA* and *Solvency*, the natural logarithm is applied to the control variables, re-scaling the obtained data, in order to smooth the extreme observation values compared to the dependent variable (Brooks, 2008).

¹² *S&P Capital IQ* calculates operating cash flow as following: $CF_{Op.} = \text{net income} + \text{depreciation and amortisation} + \text{amortisation of deferred charges, total} (-CF) + \text{other non-cash items, total} + \text{change in net operating assets}$.

¹³ *S&P Capital IQ* defines total debt/total capital as following: $\text{total debt}/(\text{total preferred equity} + \text{total common equity} + \text{total debt} + \text{minority interest})$.

¹⁴ *S&P Capital IQ* calculates operating income as following: $\text{Operating income} = \text{Total revenue} - \text{operating expenses} - \text{cost of goods sold} - \text{selling, general and administrative expenses} - \text{R\&D} - \text{depreciation and amortization} - \text{other operating expenses}/ \text{income}$.

3.7. Regression

3.7.1. Regression Design

The sample consists of firm-deal-level observations. Consequently, panel data is used because both cross-sections (companies) as well as time series (announcement dates) are in place. We have an unbalanced panel data since the number of time-observations is not the same for every cross-sectional unit. Panel data provides the possibility to deal with more complex problems by combining cross-sectional observations with developments in time. Moreover, panel data can improve the power of the regression by increasing degrees of freedom (Brooks, 2008). We run multivariate regressions using the software *EViews 8*. The coefficient estimates are determined by applying the ordinary least square (OLS) method. Thereby, the significance of each coefficient is obtained from the t-statistic derived from *EViews 8*. The regressions are based on the following equations:

$$\begin{aligned} [1] \quad CAR3Day_{it} = & \alpha + \beta_1 Age_{it} + \beta_2 CEOTenure_{it} + \beta_3 FirmTenure_{it} + \beta_4 BoardOutside_{it} \\ & + \beta_5 Experience_{it} + \beta_6 EducationBT_{it} + \beta_7 BusinessOnly_{it} \\ & + \beta_8 TechnicalOnly_{it} + \beta_9 ThreeOrMore_{it} + \varepsilon_{it} \end{aligned}$$

As mentioned above, several deal-specific and firm-specific control variables are included to account for other important influence factors on the CAR around an acquisition's announcement day. X represents the set of control variables as outlined in section 3.6.3..

$$\begin{aligned} [2] \quad CAR3Day_{it} = & \alpha + \beta_1 Age_{it} + \beta_2 CEOTenure_{it} + \beta_3 FirmTenure_{it} + \beta_4 BoardOutside_{it} \\ & + \beta_5 Experience_{it} + \beta_6 EducationBT_{it} + \beta_7 BusinessOnly_{it} \\ & + \beta_8 TechnicalOnly_{it} + \beta_9 ThreeOrMore_{it} + \gamma X_{it} + \varepsilon_{it} \end{aligned}$$

Generally, several assumptions have to be fulfilled for the OLS method to be valid. Thus, different tests are performed to confirm the validity of the assumptions and to identify measures that can be applied to deviations.

3.7.2. Regression Assumptions

- **Testing for Multicollinearity**

Before running the regressions, we test for multicollinearity by looking at the correlation matrix between individual independent variables. 'Near multicollinearity' occurs when explanatory variables are highly correlated with each other and as a common rule of thumb,

the values -0.8 and 0.8 are used as thresholds (Brooks, 2008). Multicollinearity can cause crucial problems since individual variables will have large standard errors and are likely to be insignificant. Furthermore, the regression gets sensitive to the inclusion and omission of variables. Therefore, we follow Brook's (2008) approach and drop one of the collinear variables if multicollinearity is detected.

- **Testing for Heterogeneity**

The 'final OLS regression' is also tested for heterogeneity bias which implies that the error terms in the cross-sectional or in the period dimension deviate systematically from zero, resulting in large residual sum of squares. Heterogeneity violates the OLS assumption that independent variables are uncorrelated with the error term.¹⁵ The inclusion of fixed effects for each cross-sectional unit or for each time period can solve the problem of heterogeneity by picking up systematic deviations of the error term and pushing down the residuals to minimise their deviation from zero. Thereby, the fixed-effects model introduces a different intercept for each cross-sectional unit or time period, respectively (Brooks, 2008). Thus, we already account for certain forms of omitted variables bias in the regression.

Following Ferris, Jayaraman and Sabherwal (2013) and Yim (2013), year-fixed effects are applied in order to control for time-varying effects that are constant cross-sectionally. The inclusion of year-fixed effects is likely to be crucial since mergers occur in aggregate waves (Gaughan, 2011; Yim, 2013) and since we cover the period of the financial crisis in our sample. Due to the fact, that the sample's time identifier is the announcement date of the acquisition, we manually include year dummy variables for the year in which the acquisition is announced. The distribution of acquisition announcements during the ten-year time period can be seen in table 1.

¹⁵ $Cov(u_t, x_t) = 0$

	Full-sample: 164 observations	
	yes (1)	no (0)
2004	20	144
2005	20	144
2006	16	148
2007	21	143
2008	14	150
2009	11	153
2010	19	145
2011	19	145
2012	13	151
2013	11	153

Table 1: Distribution of acquisition announcements between 2004 and 2013

Moreover, cross-sectional fixed effects are included to control for unobservable company-specific effects that are time-invariant (Brooks, 2008; Yim, 2013). Our sample contains many companies with only one or two observations during the ten-year period. Using time-invariant effects for single observations or two observations that are far apart in time is unnecessary. Consequently, cross-sectional unit dummy variables are manually included, only for the companies that have three or more acquisition announcements during the observed time period.

Since manual dummy variables are included, the redundant fixed effects test in *EViews* cannot be applied. Instead, heterogeneity is detected if some year and cross-sectional unit dummy variables, respectively, are statistically significant. In that case, their inclusion adds explanatory power. However, including year and cross-sectional unit dummy variables decreases the degrees of freedom. Brooks (2008) argues that including insignificant variables can negatively affect the significance of other variables by increasing the standard errors and by using up degrees of freedom. Thus, we exclude all control variables as well as manual year and cross-sectional unit dummy variables that have a p-value above 0.15.

- **Testing for Heteroscedasticity**

Another OLS assumption implies that the error term has a constant variance.¹⁶ If the requirement is not fulfilled, the errors are said to be heteroscedastic (Brooks, 2008). To test whether the null hypothesis of homoscedasticity must be rejected, a manual Breusch-Pagan-Godfrey test is performed. In doing so, the residual series of the regression, including manual

¹⁶ $\text{Var}(u_i) = \sigma^2 < \infty$

fixed effects, is squared. Afterwards, the independent variables are run on the squared residuals. If heteroscedasticity is detected, White robust standard errors will be applied to account for this problem (Brooks, 2008).

- **Testing for Autocorrelation**

The residuals of the OLS regression are assumed to be uncorrelated with each other over time.¹⁷ If autocorrelation is detected, the OLS estimates are still unbiased but the inferences are incorrect. Testing for autocorrelation can be done with the Durbin-Watson test. It tests for first order autocorrelation, implying that it focuses on the relationship between the residual and the immediately previous one (Brooks, 2008). A Durbin-Watson statistic close to 2 indicates no autocorrelation. A value close to 0 detects positive autocorrelation whereas a value close to 4 identifies negative autocorrelation.

- **Testing for Normality**

To test whether the residuals fulfil the requirements of normal distribution¹⁸, the Jarque-Bera test is applied. If the null hypothesis of normal distribution is rejected, non-normality is detected. The test includes the third and fourth moments of a distribution, namely its skewness and kurtosis. The normal distribution has a skewness of 0, which implies that the residuals are symmetrically distributed around its mean, and a kurtosis coefficient of 3. Kurtosis is a measure to determine how fat the tails of a distribution are. A distribution with kurtosis greater than 3 is said to be leptokurtic whereas a distribution with kurtosis smaller than 3 is called platykurtic¹⁹ (Brooks, 2008). Dealing with financial and economic data, it is quite common not to have a normal distributed residual series. One can either transform the variables by using the natural logarithm to smooth outliers or use dummy variables to exclude outliers (Brooks, 2008). In our case, the logarithm cannot be applied to the dependent variable *CAR3Day* due to many negative observations. Besides, excluding outliers artificially improves the fit of the model and valuable information gets lost. Therefore, an additional robustness test is performed in which outliers are excluded to compare the results with the full sample regression.

¹⁷ $\text{Cov}(u_i, u_j) = 0$

¹⁸ $u_t \sim N(0, \sigma^2)$

¹⁹ Leptokurtic implies fatter tails and a higher peak at the mean compared to a normal distribution. In contrast, a platykurtic distribution has thinner tails and is less peaked than the normal distribution (Brooks, 2008).

3.7.3. Further Robustness Tests

In order to further verify the findings of the ‘final regression’, some variables and conditions are slightly modified.

- **Dependent Variable: *CAR5Day***

Due to the fact that Doukas and Petmezas (2007) as well as Fuller, Netter and Stegemoller (2002) use a five-day window around the acquisition’s announcement day, we test whether the regression results considerably change by substituting the dependent variable *CAR3day* with *CAR5day*. *CAR5Day* is calculated following the same methodology as *CAR3Day*, outlined in section 3.5.2..

- **Age Groups and *CEOTenure* Groups**

Following Levi, Li and Zhang (2010), Kolasinski and Li (2013) and Yim (2013), the variable *Age* is altered to binary variables corresponding to three or five age groups, respectively. Using age terciles, the first age group *YoungCEO* comprises CEOs between 40 and 52, the second age group *MidAgeCEO* consists of CEOs being 53-58 years old and *OldCEO* are CEOs between 59 and 65. *MidAgeCEO* presents the omitted group that is not included in the regression. The distribution of CEOs into five age groups can be seen in table 2 below, where *AgeGroupV* presents the omitted group.

Due to a likely correlation between *Age*, *CEOTenure* and *FirmTenure*, the application of groups ensures a non-linear relationship to be able to correctly identify the effect of each variable (Yim, 2013). Based on the same explanation, the variables *CEOTenureLessFive* and *CEOTenureFive* are included in further regressions. Moreover, including these binary variables for *CEOTenure* controls for potential selection bias in our sample. If young CEOs are hired by companies that are planning to engage in acquisition activities, the effect of *Age* on abnormal returns should be lower for short-tenured CEOs (less than five years) than for long-tenured CEOs (Yim, 2013).

	Full-sample: 164 observations	
	yes (DV=1)	no (DV=0)
YoungCEO (40-52)	69	95
MidageCEO (53-58)	61	103
OldCEO (59-65)	34	130
AgeGroupI (40-45)	8	156
AgeGroupII (46-50)	46	118
AgeGroupIII (51-55)	48	116
AgeGroupIV (56-60)	40	124
AgeGroupV (61-65)	22	142
CEOTenureLessFive	73	91
CEOTenureFive	91	73

Table 2: Distribution of CEOs by *Age* and *CEOTenure* groups

- **Period Sub-Samples: 2004-2007 and 2008-2013**

As a last robustness test, the sample is divided into two sub-samples, corresponding to the time period from 2004 to 2007 and from 2008 to 2013. Even though the length of the time period is unequal, this division enables us to gain conclusions how the financial crisis changed the influence of our variables of interest on *CAR3Day*. The time period 2004 to 2007 covers the sixth merger wave (Gaughan, 2011) whereas the time period 2008 to 2013 observes the acquisition performance at the peak of and after the financial crisis. A limitation of this approach is the small sample for each period with less than 100 acquisitions.

The binary variable *ThreeOrMore* takes now the value 1 if the CEO pursues three or more acquisitions during the sub-sample period. Additionally, the cross-sectional unit dummy variables are only included for the companies having three or more time observations in the specific sub-sample time period. For the sub-sample regressions, we follow the same approach as for our full sample. Firstly, all control variables, year- as well as cross-sectional units dummy variables are included to test for their explanatory power. Secondly, those variables that are not statistically significant, p-value above 0.15, are excluded again.

3.8 Validity and Limitations

As this research study is based on data derived from several data sources, the potential of error sources increases. However, the data is taken from databases provided by reliable

financial market data providers like *Thomson Reuters* or the audited annual reports of the companies, enhancing the validity of our data. In order to account for the reliability of our data sample and thus, the interpretation of our empirical results, different limitations are outlined below.

- **Sample Size and Data Availability**

One of the main limitations of this study is the restricted sample size of 164 acquisition announcements over a ten-year time period (appendix A). Due to the fact that the data has to be hand-collected from different data sources, we only focus on acquisitions of FTSE 100 companies, representing the UK as the main takeover market in Europe (CMS, 2013). Consequently, we are only able to draw inferences about the effect of CEO characteristics on CARs of acquisition announcements in the UK. After applying the defined restrictions to the companies (appendix B) and their acquisitions, only 56 companies are included in our full-sample. As a consequence of the small sample size, it is more difficult to find significant and valid results and potential biases may arise.

- **Omission of Variables of Interest**

Many studies apply specific governance variables to analyse their influence and importance on M&A performance. Especially the number of CEOs who are also chairman of the board at the same company, known as CEO duality, is often included as a measure of CEO power over the board (Malmendier and Tate, 2008). Since the UK corporate governance code includes the elimination of CEO duality (Tricker, 2012), we cannot investigate this variable in our sample. Besides, all CEOs in our sample serve as executive directors in the board of their company. Therefore, the analysis of the impact of inside board membership on CARs is also not possible. As a result, only the governance variable *BoardOutside* is applied in the multivariate regression analyses.

- **Financial Crisis 2007/2008**

Due to the fact that the full-sample includes the financial crisis of 2007/2008, the CARs of acquisition announcements might be more affected by the economic downturn than actually representing the influence of CEO characteristics. In addition, the crisis succeeded the sixth merger wave, also representing a deviation from normal market developments.

We account for this problem by including year fixed effects and by running a robustness test with sub-samples, covering pre-and post-crisis acquisitions. However, including the financial

crisis in our time period has also the objective to investigate whether the financial crisis has a substantial and persistent effect on the influence of CEO characteristics on M&A performance. Nevertheless, due to the statistical small number of observations, the sub-samples do not allow for significant conclusions.

- **Market-adjusted Model**

Another potential weakness of this research approach is the use of the market-adjusted model. Campbell, Lo and MacKinlay (1997:156) recommend only to apply the market-adjusted model as a “last resort” since biases are likely to arise. Since the market parameters α and β are not estimated over an estimation-window, the calculated abnormal returns will be wrong if the restriction of α equal to 0 and β equal to 1 is false. The advantage of using the market model is that it removes exactly the part of the stock return that is related to the development of the market’s return. Thus, the calculated abnormal returns are able to detect the influence of a certain event (MacKinlay, 1997). Nevertheless, as mentioned before, many previous studies have used the market-adjusted model to measure CARs around an acquisition announcement and it is confirmed that the market model and the market-adjusted model yield similar results (Fuller, Netter and Stegemoeller, 2002; Malmendier and Tate, 2008; Sirower and O’Byrne, 1998).

- **Endogeneity**

A common problem, when dealing with corporate financial data, is endogeneity. Endogeneity is present when one or several independent variables are correlated with the error term of the regression. The existence of endogeneity is problematic because it leads to biased and inconsistent parameters (Roberts and Whited, 2012). The main potential causes of endogeneity in our regressions are omitted variables and measurement error. We already account for some forms of omitted variables bias by including cross-sectional unit and period fixed effects (Brooks, 2008). Nevertheless, potentially important variables might still be omitted in this study due to time and data limitations, such as diversifying merger, cash or stock payment and private or public target. These variables are likely to influence the short-term CARs as well as one or more of the independent variables. Measurement error refers to the discrepancies between the true variable of interest and the proxy (Roberts and Whited, 2012). Since we use, for instance, *CAR3Day* as a proxy for short-term M&A performance and *ThreeOrMore* as a proxy for high acquisitiveness, results have to be interpreted carefully.

4. Empirical Results

This chapter summarises the empirical findings derived from our sample of 164 acquisition announcements. First, the statistics of the variables are presented; second the results of the fundamental regressions are outlined and third, the ‘final regression’ results are compared to the results of the robustness tests.

4.1. Descriptive Statistics

Looking at the dependent variable, one can identify that the median CAR over the three-day window around the acquisition’s announcement day is 0.27% and its mean is 0.45%. Thus, we can confirm the statement that, on average, acquiring firms fail to achieve substantial value creation (Roll, 1986; Sirower and O’Byrne, 1998). The abnormal returns range from a minimum value of -20.56% up to a maximum value of 13.52%. The distribution of the *CAR3day* observations is negatively skewed and leptokurtic.

As presented in table 3, the median CEO in our full sample is 53 years old, has five years of tenure and has worked for the company for 11.5 years. The age of CEOs undertaking acquisitions varies from 40 years to 65 years in our sample. *CEOTenure* and *FirmTenure* range from 0 years to 27 years and 42 years, respectively.

	CAR3DAY	AGE	CEOTENURE	FIRMTENURE
Mean	0.004502	53.74390	6.268293	13.63415
Median	0.002703	53.00000	5.000000	11.50000
Maximum	0.135215	65.00000	27.00000	42.00000
Minimum	-0.205642	40.00000	0.000000	0.000000
Std. Dev.	0.042926	5.468955	5.198038	9.552583
Skewness	-0.482581	0.031540	1.449573	0.725930
Kurtosis	7.124315	2.359381	5.422259	2.794140
Observations	164	164	164	164

Table 3: Statistical measures for *CAR3day*, *Age*, *CEOTenure* and *FirmTenure*

Table 4 shows the number of observations for each dummy variable included in the full-sample as well as in the sub-sample periods. Remarkably, nearly 90% of the full-sample CEOs hold an outside board position whereas less than 50% have previous CEO experience.

The majority of the acquisitions are done by CEOs who have a business education and only a few CEOs hold double-degrees. Overall, 47 acquisitions are announced by CEOs which have already undertaken at least three acquisitions.

	Full-sample: 164 observations		Sub-sample 2004-2007: 77 observations		Sub-sample 2008-2013: 87 observations	
	yes (1)	no (0)	yes (1)	no (0)	yes (1)	no (0)
BoardOutside	144	20	66	11	78	9
Experience	72	92	36	41	36	51
EducationBT	21	143	8	68	13	74
BusinessOnly	99	65	48	29	51	36
TechnicalOnly	24	140	14	63	10	77
ThreeOrMore	47	117	9	68	21	66
FirstDeal	75	89	44	33	31	56

Table 4: Distribution of observations for all dummy variables

Taking a closer look at the absolute values of deal- and firm-specific control variables (appendix E), the deal values cover a wide range from GBP 4 million (m) to GBP 9,635 m. The median deal size of GBP 193 m is far apart from the mean deal value of GBP 656 m, indicating outliers. Similarly, the variables *Assets* and *MarketCap* have large standard deviations from their mean of GBP 11,657 m and GBP 12,598 m, respectively. The sample firms have on average positive operating cash flows, (mean: GBP 1,329 m; median GBP 390 m), positive ROA (mean: 7.69%; median: 6.95%) and positive operating incomes (mean: GBP 1,181 m; median: GBP 369 m). However, negative observations for these variables are also found in the firm sample. The sample companies invest on average (mean) GBP 6,669 m in property plan and investment, represented by the variable *CapEx*. The variable *Q* has a mean of 1.64 and 162 observations ranging from 0.42 to 7.29. The mean total debt to capital ratio, represented by the variable *Solvency*, is 38.70%, but also ratios above 100% are observed.

4.2. Regression Model

4.2.1. Multicollinearity

As a result of the correlation matrix (appendix F), ‘near multicollinearity’ is detected between the variables $\ln_MarketCap$ and \ln_Assets , as well as between \ln_OpCF and \ln_Assets and between \ln_CapEx and \ln_Assets . Moreover, \ln_OpCF and \ln_CapEx are both highly correlated to $\ln_MarketCap$. Consequently, the variables $\ln_MarketCap$, \ln_OpCF and \ln_CapEx are not integrated in the regression, since their inclusion would disturb the OLS estimations. The matrix shows that there is no problem of multicollinearity between the variables of interests. Age and $CEOTenure$ have a correlation coefficient of 0.2992 and the correlation coefficient of $CEOTenure$ and $FirmTenure$ is 0.4378. Consequently, equation 2, introduced in section 3.7.1., is specified as:

$$\begin{aligned} [2] \quad CAR3Day_{it} = & \alpha + \beta_1 Age_{it} + \beta_2 CEOTenure_{it} + \beta_3 FirmTenure_{it} + \beta_4 BoardOutside_{it} \\ & + \beta_5 Experience_{it} + \beta_6 EducationBT_{it} + \beta_7 BusinessOnly_{it} \\ & + \beta_8 TechnicalOnly_{it} + \beta_9 ThreeOrMore_{it} + \beta_{10} FirstDeal_{it} \\ & + \beta_{11} \ln_DealSize_{it} + \beta_{12} \ln_Assets_{it} + \beta_{13} Q_{it} + \beta_{14} ROA_{it} + \beta_{15} Solvency_{it} \\ & + \beta_{16} \ln_OpInc_{it} + \varepsilon_{it} \end{aligned}$$

4.2.2. Multivariate Regressions

Table 5 presents the regression results for the four fundamental regressions, based on equation 1 and 2, as stated in section 3.7.1 and 4.2.1, as well as the application of year- and company dummy variables.

Looking at the results of regression 1, one can see that none of the variables of interest is statistically significant. Therefore, we cannot reject the null hypothesis that the coefficients of the variables are 0 with certainty (Brooks, 2008). Following equation 2, regression 2 includes control variables to account for deal- and firm-specific factors that potentially influence CARs. Unexpectedly, the included control variables do not explain any variation in the dependent variable $CAR3Day$. The positive coefficient values of ROA , $\ln_DealSize$ and \ln_OpInc , and the negative coefficients of the variables $FirstDeal$, \ln_Assets , Q and $Solvency$ are not statistically significant. Compared to regression 1, regression 2 shows very similar coefficient results for the variables of interest and they are still statistically insignificant.

Focusing on regression 3, the manual inclusion of year- as well as cross-sectional dummy variables to account for heterogeneity in both dimensions changes the regression results for

the variables of interest. Nevertheless, all control variables are still statistically insignificant. As mentioned in section 3.7.2., we exclude all insignificant control variables as well as insignificant year and company dummy variables in order to save degrees of freedom. The remaining dummy variables are listed in table 5 under regression 4. As a result, regression 4 is considered as the ‘final regression’ and its results are used to interpret the seven defined hypotheses.

TABLE 5: The table reports the coefficient results of OLS regressions using the sample of 164 acquisitions of FTSE 100 companies from 2004 to 2013. The dependent variable refers to the CAR over a three day window around the acquisition announcement (CAR3Day). The variables of interest are defined as outlined in section 3.6.2. Regression (1) is based on equation 1 (section 3.7.1) without controlling for any firm-specific characteristics. Regression (2) is based on equation 2 (section 4.2.1) with the inclusion of the following control variables: FirstDeal, ln_Dealsize, ln-Assets, Q, ROA, Solvency, ln_OpInc. The control variables are defined as outlined in section 3.6.3. Regression (3) is based on equation 2 and further includes year-fixed effects as well as cross-sectional unit dummy variables for companies that have three or more acquisitions during the ten-year time period. Those companies include ABF, AstraZeneca, Babcock, BAE_Systems, Capita, Centrica, Experian, GKN, GSK, IMI, Intertek, Johnson_Matthey, Meggitt, Pearson, Persimmon, Reckitt_Benckiser, Reed_Elsevier, Rexam, Shire, Travis_Perkins, Tullow_Oil, Vodafone, Weir, William_Hill, Wolseley, WPP. Regression (4) is based on regression (3) and exclude all control variables and year- and cross-sectional unit dummy variables with p-values above 0.15. Year dummy variables are included for the years 2004, 2005, 2006, 2008, 2009. Cross-sectional units dummy variables are included for the companies AstraZeneca, IMI, Rexam, Shire, Weir, William_Hill, Wolseley. Regression (4) represents the 'final regression'. It is the foundation for the robustness tests as well as the discussion. T-statistics are shown in paranthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)	(4)
Age	0.0006 (0.8504)	0.0002 (0.2474)	0.0024 (2.1351)**	0.0027 (3.6769)***
CEOTenure	-0.0006 (-0.6913)	-0.0006 (-0.7742)	-0.0031 (-1.8028)*	-0.0015 (-1.8071)*
FirmTenure	0.0000 (0.0959)	-0.0001 (-0.2429)	0.0005 (0.6454)	0.0003 (0.6857)
BoardOutside	0.0139 (1.2903)	0.0052 (0.4735)	0.0009 (0.0689)	-0.0011 (-0.1065)
Experience	-0.0025 (-0.2935)	-0.0063 (-0.7649)	-0.0007 (-0.0568)	-0.0011 (-0.1425)
EducationBT	-0.0198 (-1.4065)	-0.0130 (-0.9078)	-0.0310 (-1.3311)	-0.0301 (-2.1263)**
BusinessOnly	-0.0148 (-1.3236)	-0.0172 (-1.5656)	-0.0144 (-0.8574)	-0.0036 (-0.3403)
TechnicalOnly	-0.0041 (-0.2959)	-0.0063 (-0.4633)	-0.0112 (-0.5707)	-0.0073 (-0.5359)
ThreeOrMore	-0.0098 (-1.1418)	-0.0098 (-1.0318)	-0.0135 (-1.1229)	-0.0285 (-3.2991)***
Constant	-0.0203 (-0.5182)	0.0474 (1.0305)	-0.0306 (-0.4451)	-0.1070 (-2.6263)***
Control Variables	No	Yes	Yes	No
Year-Fixed	No	No	Yes	Several
Cross-Section Fixed	No	No	Yes	Several
R²	0.0456	0.0613	0.3644	0.2846
adjusted-R²	-0.0102	-0.0437	0.0642	0.1788
F-stat	0.8174	0.5836	1.2140	2.6897
Prob (F-stat.)	0.6009	0.8923	0.1999	0.0003

Table 5: Multivariate regressions based on equations 1 and 2

The variable *Age* has a positive coefficient which indicates that the older the CEO is, the more positive are the CARs of the acquisition announcements. More precisely, one year increase in age leads to an increase of abnormal returns of 0.27% which implies that an age difference of five years affects the abnormal returns by over 1%. The coefficient is statistically significant at a 1% significance level. Consequently, our first hypothesis is confirmed.

In contrast to *Age*, *CEOTenure* has a negative effect on *CAR3Days*. An increase of the CEO tenure by one year leads to a decrease of abnormal returns of 0.15%. The coefficient value is statistically significant at a 10% significance level. Due to the negative and significant coefficient, our second hypothesis must be rejected. *FirmTenure* has a slightly positive coefficient but it is not statistically significant. Hence, the third hypothesis can be neither confirmed nor rejected.

The dummy variables *BoardOutside* and *Experience* have both a negative influence on CARs around the acquisition announcements but their effect is not statistically significant. Consequently, for each variable we cannot reject the null hypothesis that the variable does not explain any variation in *CAR3Day*. Thus, we can neither confirm nor reject the fourth and the fifth hypothesis with certainty.

The dummy variable *EducationBT* has a negative coefficient value of -0.0301, indicating a strong negative influence on the short-term CARs around acquisition announcements. It is statistically significant at a 5% significance level. Hence, we confirm hypothesis 6a. The coefficients of the variables *BusinessOnly* and *TechnicalOnly* are both negative but their t-statistics are insignificant. Thus, hypothesis 6b cannot be confirmed since *BusinessOnly* does not indicate a stronger negative influence on *CAR3Day* compared to *TechnicalOnly*.

The last variable of interest, *ThreeOrMore*, is statistically significant at a 1% significance level. The coefficient value of -0.0285 implies a negative effect on CARs. Hence, the last hypothesis, indicating a negative influence of high acquisitiveness on abnormal stock returns around acquisition announcements, is confirmed.

Compared to the first pooled regression, regression 4 shows an increase of around 20% of the goodness of fit. The regression is statistically significant at a 1% significance level due to an F-test of 2.6897. The Durbin-Watson statistics of 2.2066 indicates no severe problem of autocorrelation. Furthermore, the performed Breusch-Pagan-Godfrey test does not indicate the presence of heteroscedasticity. Thus, we can conclude that the assumption of homoscedasticity holds.

4.3. Robustness Tests

TABLE 6: The table reports the coefficient results of OLS regressions performed as robustness tests. Regressions (6) to (10) are based on the full sample of 164 acquisitions of FTSE 100 companies from 2004 to 2013. Except for regression (6), the dependent variable refers to the CAR over a three day window around the acquisition announcement (CAR3Day). The variables of interest are defined as outlined in section 3.6.2. Regression (5) to (10) apply the same year and cross-sectional unit dummy variables as regression (4) (see table 5). Hence, year dummy variables are included for the years 2004, 2005, 2006, 2008, 2009. Cross-sectional unit dummy variables are included for the companies AstraZeneca, IML, Rexam, Shire, Weir, William_Hill, Wolseley. Control variables are not included as in regression (4). Regression (5) is based on a sample of 159 acquisitions because acquisitions with extreme CAR3Day values are excluded to achieve a normality distribution of residuals. In regression (6), the dependent variable refers to the CAR over a five-day window around the acquisition announcement (CAR5Day). Regression (7) applies tercile age groups where MidAgeCEO (53-58) represents the omitted group. Regression (8) distributes the CEOs' age in five age groups and AgeGroupV (61-65) is the omitted group. Regression (9) uses the dummy variable CEOTenureLessFive instead of CEOTenure. Regression (10) includes the variable CEOTenureFive instead of CEOTenure. Regression (11) and (12) present the sub-samples for the years from 2004 to 2007 and from 2008 to 2013, respectively. Regression (11) is based on a sample of 77 acquisitions. No year-fixed effects are included and one cross-sectional dummy variable for the company Tullow_Oil is applied. Regression (12) is based on a sample of 87 acquisitions. A year dummy variable for 2008 is included as well as cross-sectional unit dummy variables for the companies Experian, Shire and Weir. T-statistics are shown in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age	0.0015 (2.3861)**	0.0028 (3.4126)***			0.0025 (3.3725)***	0.0025 (3.3725)***	8.97E-05 (0.0828)	0.0014 (1.4235)
YoungCEO (40-52)			-0.0213 (-2.6814)***					
OldCEO (59-65)			0.0015 (0.1532)					
AgeGroupI (40-45)				-0.0567 (-2.8517)***				
AgeGroupII (46-50)				-0.0168 (-1.3044)				
AgeGroupIII (51-55)				-0.0073 (-0.5975)				
AgeGroupIV (56-60)				0.0130 (1.0461)				
CEOTenure	-0.0010 (-1.3607)	-0.0013 (-1.3314)	-0.0009 (-1.0785)	-0.0014 (-1.6125)*			0.0017 (1.0212)	-0.0021 (-2.1817)**
CEOTenureLess Five					0.0064 (0.7835)			
CEOTenureFive						-0.0064 (-0.7835)		
FirmTenure	0.0004 (1.0067)	0.0001 (0.2673)	0.0001 (0.2634)	0.0005 (0.9682)	0.0001 (0.1750)	8.17E-05 (0.1750)	5.53E-05 (0.0763)	0.0003 (0.5022)
BoardOutside	-0.0069 (-0.7713)	-0.0074 (-0.6384)	0.0034 (0.3200)	-0.0055 (-0.5153)	-0.0023 (-0.2181)	-0.0023 (-0.2181)	0.0342 (1.9663)**	-0.0016 (-0.1129)
Experience	0.0003 (-0.0438)	-0.0026 (-0.2942)	-0.0002 (-0.0190)	0.0020 (0.2493)	0.0002 (0.0282)	0.0002 (0.0282)	0.0066 (0.4832)	-0.0009 (-0.0752)
EducationBT	-0.0168 (-1.3740)	-0.0363 (-2.2989)**	-0.0314 (-2.1724)**	-0.0350 (-2.4756)**	-0.0259 (-1.8430)*	-0.0259 (-1.8430)**	-0.0504 (-1.8968)*	-0.0053 (-0.3454)
BusinessOnly	-0.0082 (-0.8975)	-0.0080 (-0.6731)	-0.0081 (-0.7417)	-0.0100 (-0.9317)	-0.0016 (-0.1521)	-0.0016 (-0.1521)	-0.0479 (-2.2664)**	0.0094 (0.7160)
TechnicalOnly	-0.0172 (-1.4736)	-0.0043 (-0.2858)	-0.0053 (-0.3801)	-0.0146 (-1.0372)	-0.0011 (-0.0811)	-0.0011 (-0.0811)	-0.0397 (-1.6040)	0.0139 (0.7908)
ThreeOrMore	-0.0234 (-3.1290)***	-0.0255 (-2.6438)***	-0.0253 (-2.9125)***	-0.0258 (-2.9132)***	-0.0312 (-3.6393)***	-0.0312 (-3.6393)***	0.0047 (0.2735)	0.0015 (0.1400)
Constant	-0.0493 (-1.3743)	-0.1000 (-2.1950)**	0.0426 (2.4832)**	0.0468 (2.4277)**	-0.1097 (-2.4642)**	-0.1033 (-2.4684)**	0.0014 (0.0244)	-0.0616 (-1.1175)
Control Variables	No	No	No	No	No	No	No	No
Year-Fixed	Several	Several	Several	Several	Several	Several	No	One
Cross-Section Fixed	Several	Several	Several	Several	Several	Several	One	Several
R²	0.2398	0.2360	0.2630	0.3072	0.2713	0.2713	0.1532	0.2829
adjusted-R²	0.1233	0.1230	0.1481	0.1876	0.1635	0.1635	0.0249	0.1552
F-stat	2.0577	2.0887	2.2876	2.5680	2.5172	2.5172	1.1944	2.2154
Prob (F-stat.)	0.0073	0.0061	0.0020	0.0003	0.0007	0.0007	0.3109	0.0169

Table 6: Robustness tests

4.3.1. Exclusion of Outliers

Due to the fact that the residuals of the ‘final regression’ are negatively skewed and leptokurtic, the Jarque-Bera test rejects the null hypothesis of normal distribution (appendix G). By excluding the five acquisitions that have the most extreme *CAR3Day* observations²⁰ from the regression, one can achieve normality of the residuals and artificially improve the fit of the regression. Looking at the results of regression 5 of table 6, one can see that two variables of interest are not statistically significant anymore, namely *CEOTenure* and *EducationBT*. Besides, the coefficient of *Experience* changes from being negative to slightly positive. However, all other variables follow the same trend as in the full-sample regression and *Age* and *ThreeOrMore* are still highly statistically significant. As a result, the authors are aware of the fact that the results of the full-sample regression have to be treated with caution.

4.3.2. Dependent Variable: *CAR5Day*

Using a five-day window around the acquisitions’ announcement days to calculate CARs, regression 6, yields overall the same results as regression 4. The only crucial difference is that *CEOTenure* is not statistically significant at a 10% significance level.

4.3.3. Age Groups and *CEOTenure* Groups

To account for the partial correlation between *Age* and *CEOTenure*, we replace *Age* by different age groups. Applying three age groups, regression 7, the variable *YoungCEO* is statistically significant at a 1% significance level and shows a strong negative influence of -2.13% on *CAR3Day*. In contrast, *OldCEO* shows a positive effect on CARs but the coefficient is not statistically significant. Looking at the regression with five age groups, regression 8, the results are very similar. *AgeGroupI* is statistically significant at a 1% significance level and has a strong negative coefficient. *AgeGroupII*, *AgeGroupIII* and *AgeGroupIV* are statistically insignificant but the coefficient trend goes from negative to positive for the oldest group. These regression results present an additional and strong confirmation of our first hypothesis.

To further account for the correlation between *Age* and *CEOTenure* as well as for the correlation between *CEOTenure* and *FirmTenure*, *CEOTenure* is divided into two groups:

²⁰ The five most extreme *CAR3Day* observations belong to the acquisitions: ARM Holdings PLC- 23.08.04; Babcock International Group PLC- 10.05.07; GKN PLC- 05.07.12; Shire PLC- 21.04.05; Weir Group PLC- 21.06.07.

CEOs, who have less than five year of CEO Tenure, *CEOTenureLessFive*, and CEOs having served five or more years as the CEO in the company announcing the acquisition, *CEOTenureFive*. The coefficient of the dummy variable *CEOTenureLessFive* has a positive effect, regression 9, whereas the coefficient *CEOTenureFive* is negative, regression 10, supporting our previous results. Nevertheless, both dummy variables are statistically insignificant in contrast to the linear *CEOTenure* variable. However, the coefficients of *Age* and *FirmTenure* are unaffected by the change which reinforces that the correlation between those variables does not interfere our results.

4.3.4. Period Sub-Samples: 2004-2007 and 2008-2013

Due to the fact that the financial crisis of 2007/2008 had a strong influence on M&A activities, it is tested whether it also had an influence on how CEO characteristics affect short-term abnormal stock returns around the announcement day. Looking at the result of the sub-panel from 2004 to 2007 (regression 11), the coefficient of *Age* is slightly positive but not statistically significant. In contrast to the results of the full-sample regression, the variables *CEOTenure*, *FirmTenure*, *BoardOutside*, *Experience* as well as *ThreeOrMore* have a positive influence on *CAR3Day*. The three education variables still negatively affect the CARs. The coefficients of *BoardOutside*, *EducationBT* and *BusinessOnly* are statistically significant.

The sub-sample from 2008 to 2013, regression 12, substantially differs from the first sub-sample. The positive coefficient value of the variable *Age* is still not statistically significant but its t-value increased from 0.0838 to 1.4235. *CEOTenure* is now statistically significant at a 5% significance level and has a negative influence on *CAR3Day*, which is in line with the results of our full-sample regression. Moreover, *BoardOutside*, *Experience* and *EducationBT* have a negative but insignificant coefficient. The fact that the coefficient of the variable *ThreeOrMore* is positive and statistically insignificant in both sub-samples is likely to be a result of the small number of CEOs, which pursue three or more acquisitions from 2004 to 2007 and from 2008 to 2013, respectively.

5. Discussion

Overall, we confirm that CEO characteristics do have an important influence on short-term M&A performance. In the following, we make use of the theory of agency costs as well as the theory of overconfidence to explain our multivariate regression results.

5.1. Age of the CEO

H1: The acquisition undertaken by a young CEO has a weaker short-term M&A performance than the acquisition undertaken by an older CEO.

Overall, the variable *Age* shows a significant and strong positive influence on short-term abnormal stock returns around the acquisition's announcement. Thus, the confirmation of the first hypothesis supports Yim (2013), who finds lower, but statistically insignificant, acquisition announcement returns for younger CEOs.

On the one hand, one can assume that these findings contradict the overconfidence theory since older people having more life-experience might be more likely to suffer from self-attribution bias. On the other hand, Ferris, Jayaraman and Sabherwal (2013) emphasise that overconfidence is inversely related to age because older people are more cautious. This conclusion is also in line with Levi, Li and Zhang (2009) who state that older CEOs are less likely to pursue acquisitions for the purpose of demonstrating their dominance due to decreasing testosterone levels.

Therefore, young CEOs are more risk-taking resulting in higher acquisitiveness than older CEOs who display more conservative decision-making behaviour (Bertrand and Schoar, 2003; Serfling, 2014). Due to the fact that high acquisitiveness is likely to result in less value creating acquisitions, the market reacts negatively to acquisition announcements (Malmendier and Tate, 2008). The statistically significant and negative coefficient of *YoungCEO* in regression 7 and *AgeGroup1* in regression 8, respectively, as well as the positive coefficients for age groups consisting of older CEOs support this argumentation.

Taking Yim's (2013) findings into account, we cannot only draw inferences from the positive age coefficient about potential overconfidence but also about the theory of agency costs. More specifically, lower CARs for younger CEOs can be a result of imperfectly aligned incentive contracts. Younger CEOs pursue more acquisitions, disregarding value-creation for shareholders, because empire-building is unintendedly supported by the company (Masulis,

Wang and Xie, 2007; Yim, 2013). One of the most influencing factors might be the compensation policy. Most companies award their CEOs for acquisitions and the increase of the company's size with long-term bonus contracts, which are unrelated to the post-acquisition performance (Bebchuk and Fried, 2005). Thus, the age effect has revealed to be the strongest where the CEO has power to influence his/ her own compensation. Thereby, agency costs for shareholders are increased (Yim, 2013). Due to the fact that the age effect is indifferent from short- or long-tenured CEOs, we can reject the possibility that companies hire younger CEOs to pursue acquisitions (Yim, 2013).

In order to make valuable propositions about whether overconfidence or incentive contracts have the most determining influence on the age effect in regards to short-term M&A performance, further research has to be conducted.

5.2. CEO Tenure

H2: The acquisition undertaken by a long-tenured CEO has a stronger short-term M&A performance than the acquisition undertaken by a short-tenured CEO.

The significant and negative influence of the variable *CEOTenure* on *CAR3Day* leads to a rejection of our second hypothesis.

Consistent with our findings, Malmendier and Tate (2008) and Yim (2013) conclude that acquisition activities increase with a CEO's tenure and that CARs decrease for long-tenured CEOs. Moreover, the results indicate that long-tenured CEOs are likely to suffer from increased overconfidence. During his/ her years as CEO, he/ she might attribute good performance to his/ her own abilities and built up an illusion of control (Doukas and Petmezas, 2007; Malmendier and Tate, 2005; Shefrin, 2005). Therefore, a positive impact of experience and knowledge, as suggested by Fung, Jo and Tsai (2009), must be rejected. Malmendier and Tate (2008) further support this argumentation by showing a strong correlation between CEO tenure and their measure of overconfidence. Since CEOs do not undertake acquisitions as frequently as other business activities, they are unlikely to learn from past mistakes (Roll, 1986).

The negative coefficient of *CEOTenure* is also considered to be a proxy for CEO power and entrenchment (Hermalin and Weisbach, 1998; cited in Yim, 2013:261). The increasing power

over a CEO's tenure can arise from detailed knowledge about the company or from emerging organisational power. As in our sample all CEOs serve as executive directors, they have a certain degree of organisational power and control over other directors. In particular executive directors are dependent on a good working relationship with the CEO, for instance to improve their career prospects in the company. Hence, CEOs increase their influence on the board of directors and their authority towards other individual directors over their tenure (Tricker, 2012).

Taking a closer look at the sub-sample regressions, one can observe a change of the coefficient's sign from positive to negative. Hence, the shareholder's perception of tenure seems to have changed after the financial crisis. Whereas before the crisis, tenure might indeed be regarded as an indicator for experience (Fung, Jo and Tsai, 2009), it is now considered as a measure of power and overconfidence (Malmendier and Tate, 2008; Yim, 2013). Focusing on S&P 1500 firms from 1992 to 2007, Yim (2013) supports this argument by finding a positive, but statistically insignificant, influence of CEO tenure on announcement returns.

5.3. Tenure of the CEO within the Firm

H3: The acquisition undertaken by a long-firm-tenured CEO has a stronger short-term M&A performance than the acquisition undertaken by a short-firm-tenured CEO.

Firm tenure as a sign of experience, commitment and knowledge enhancement can neither be confirmed nor rejected by our regression results. The slightly positive coefficient of *FirmTenure* in nearly every regression setting is in line with our hypothesis but the coefficient is always statistically insignificant. Due to the fact that the null hypothesis of no explanatory power of the variable *FirmTenure* cannot be rejected, we can conclude that shareholders do not negatively perceive a long overall work-experience for a firm, compared to *CEOTenure*. A reason for this might be that managers, who have already joined the firm before becoming CEO, are not having crucial power over the board during their time as non-CEO (Tricker, 2012). Moreover, the CEO might gain specific knowledge about the company and the industry during his/ her time in the company, which can be valuable for his/ her role as a CEO (Hillmann, Cannella and Paetzold, 2000).

5.4. CEO holding external Board Directorships

H4: The acquisition undertaken by a CEO holding a board position within another company has a stronger short-term M&A performance than the acquisition undertaken by a CEO without holding an outside directorship.

The negative but statistically insignificant coefficient of the variable *BoardOutside* does not support the hypothesis that CEOs holding outside directorships apply their independent judgments (Tricker, 2012) and objectivity (Byrd and Hickman, 1992) to their own board to pursue only value-creating M&As. A possible explanation for the insignificance of this variable is that we do not distinguish between independent and affiliated non-executive directors. A truly objective judgment is assumed to be only possible if the director has no other relation with the company except for his directorship (Adams, Hermalin and Weisbach 2010; Tricker, 2012). Therefore, we cannot draw any implications from this variable for the effectiveness of the British corporate governance system.

There are several reasons why *BoardOutside* negatively influences *CAR3Day*. First, holding a board position can be seen as a sign of status due to financial and nonfinancial benefits (Bebchuk and Fried, 2005). Second, based on the theory that directors who are or have been executives of other companies are more solidary with the CEO (Bebchuk and Fried, 2005), one can develop the argument that CEOs holding an external directorship do increase the feeling of collegiality and solidarity within their company's board. Consequently, the CEO is able to have more bargaining power over the board and the directors are less likely to disagree with the CEO's actions (Adams, Hermalin and Weisbach 2010; Tricker, 2012). Third, CEOs serving on other boards are busier than CEOs without other board positions and might focus less on their core obligations as CEO (Adams, Hermalin and Weisbach 2010).

Nevertheless, according to Lucey, Plaksina and Dowling (2013), higher social status should lead to a more risk-averse behaviour of the CEO and less acquisitiveness, contradicting our previous argumentation. Besides, Byrd and Hickman (1992) emphasise that CEOs having multiple directorships have higher incentives to reject non-value creating M&As to protect their good reputation. Moreover, CEOs might be only nominated into boards of other companies if he/ she performs well in his/ her job as CEO (Adams, Hermalin and Weisbach 2010).

Looking at the period sub-samples, the influence of the variable *BoardOutside* changes with the financial crisis. We assume that this shift is due to an enhancement of investors' scrutiny concerning the investment decision-making of CEOs (Hoffmann, Post and Pennings, 2011; KPMG, 2010).

5.5. CEO having previous CEO Experience

H5: The acquisition undertaken by a CEO having CEO experience in previous companies has a weaker short-term M&A performance than the acquisition undertaken by a CEO without previous CEO experience.

Due to the fact that the coefficient of *Experience* is statistically insignificant in all regressions, the fifth hypothesis, suggesting a negative effect of previous CEO experience on CARs, cannot be confirmed.

Elsaid, Wang and Davidson III (2011) state that stock markets react positively to the hiring of an outside CEO with previous CEO experience. However, firms that hire ex-CEOs show worse financial performances than firms hiring CEOs without CEO experience. Additionally, their study finds that ex-CEOs do not improve the performance of the company. Since CEOs without previous CEO experience sustain the good performance of their companies, they are more likely to pursue value-creating acquisitions. Thus, these arguments can give an explanation for the negative coefficient in the full-sample regression. Besides, ex-CEOs can be assumed to be more prone to overconfidence. Suffering from the self-attribution bias, they take credit for positive developments and blame others for negative outcomes during their CEO tenure at previous companies (Shefrin, 2005).

5.6. CEO's Educational Background

H6a: The acquisition undertaken by a CEO having a business and technical education background has a weaker short-term M&A performance than the acquisition undertaken by a CEO who has education in only one study field.

H6b: The acquisition undertaken by a CEO having a business education is assumed to have a weaker short-term M&A performance than the acquisition undertaken by a CEO with a technical background.

In line with our sixth hypothesis, our regression results indicate that being educated in the two study areas of business and engineering has a negative influence on *CAR3Day*. Using a CEO's education in business and engineering as a potential source of self-attribution bias and overconfidence, we can confirm that the market is aware that the CEOs' actions are more likely to be driven by overconfidence (Malmendier and Tate, 2008).

As Bertrand and Schoar (2003) find that CEOs holding an MBA degree demonstrate more aggressive behaviour, we conclude that CEOs having a double-degree might be even more ambitious and strive for recognition and good reputation. Hence, those CEOs might also be perceived as being more likely to engage in empire-building. In contrast, Lucey, Plaksina and Dowling (2013) argue that education is a determinant of social status and that CEOs with high ascribed and achieved social status are less likely to engage in acquisitions due to their fear of losing the status. However, Lucey, Plaksina and Dowling (2013) focus in their study on the reputation of the university where the CEO gained his/ her degree as well as on awards that the CEO achieved rather than the depth and breadth of his/ her educational background.

Despite the statistically significant results, the findings for *EducationBT* have to be treated with caution. Due to the fact that *Age* and *EducationBT* are negatively correlated it is presumed that younger CEOs are more likely to have a double-degree. In our sample, 62% of CEOs having two degrees are 53 years old or younger. Thus, the negative influence on CARs might be more driven by characteristics of young CEOs, such as dominant and risk-taking behaviour (Bertrand and Schoar, 2003; Serfling, 2014), rather than by his/ her educational background.

The variables *BusinessOnly* and *TechnicalOnly* also have a negative influence on stock returns even though the coefficients are not statistically significant. Only for the sub-period 2004 to 2007, *BusinessOnly* is statistically significant and has a negative coefficient value. The negative influence of business education is consistent with Malmendier and Tate's (2008) finding that finance education²¹ increases a CEO's acquisitiveness and is slightly correlated to their measure of overconfidence. Due to the fact that the well-performance of companies is driven by a CEO's management ability and skills rather than his/ her firm-specific knowledge, technical education has a negative influence on short-term M&A performance (Elsaid, Wang and Davidson III, 2011; Kaplan, Klebanov and Sorensen, 2012). However, a positive

²¹ Financial and business education are identically defined.

influence of business education on performance seems not to hold for acquisition announcements, as demonstrated in our research sample.

5.7. CEO undertaking three or more Acquisitions

H7: The acquisition undertaken by a CEO representing at least his/ her third acquisition in the sample period has a weaker short-term M&A performance than the first or second acquisition undertaken by this CEO.

Malmendier and Tate (2008) emphasise that overconfidence increases the frequency of M&As and lowers the quality and the value-creating potential of acquisitions. Consistent with this statement, we find that the market reacts negatively if a CEO pursues three or more acquisitions confirming our seventh hypothesis. Thereby, we loosen the overconfidence proxy of Doukas and Petmezas (2007) by extending the time period from three to ten years and reducing the number of acquisitions from five to three. Contradicting our results, a study of KPMG (2010) concludes that acquirers with previous M&A experience show better performance. KPMG's findings indicate that the negative market response to high acquisitiveness is only apparent for six or more acquisitions and companies that pursue three to five deals are the most successful.

Taking a different point of view, one can also argue that rational CEOs become more aggressive from deal to deal leading to a decline of CARs. Rational CEOs learn from previous successful acquisitions and are willing to pay a higher premium. In contrast, overconfident CEOs learn from the negative market response to their past acquisitions, and they may become more cautious and as a result, the CARs increase (Aktas, de Bodt and Roll, 2006). With these findings, Roll reverse his previous argumentation (1986) where he underlines that M&As are too rare to allow acquiring CEOs to learn from their past mistakes. However, the pace of learning for overconfident CEOs and the reduction of their frequent acquisition activities are found to be slow (Aktas, de Bodt and Roll, 2006). Therefore, overconfident CEOs can still cause the negative coefficient of our variable *ThreeOrMore*. Generally, Aktas, de Bodt and Roll (2006) as well as Conn *et al.* (2004) confirm the overall declining trend of CARs with an increasing number of deals. A distinction whether the negative influence of high acquisitiveness stems mainly from rational CEOs becoming aggressive (Aktas, de Bodt and Roll, 2006) or mainly from overconfident CEOs (Doukas and Petmezas, 2007; Malmendier and Tate, 2008) requires further research. It should account for a valid measure of overconfidence and the absolute number of deals.

Our result of the significant impact of variable *ThreeOrMore* cannot only be interpreted based on the overconfidence theory but also on the agency theory. The negative influence of numerous acquisitions can also be assumed to be an indicator of empire-building motivations of the CEO (Byrd and Hickman, 1992). To confirm both theories with certainty, further research with regard to free cash flow has to be undertaken since abundant internal resources give incentives for empire-building (Jensen, 1986) and they lead to more acquisitions undertaken by overconfident CEOs (Malmendier and Tate, 2008).

6. Conclusion

The final chapter summarises the result that certain CEO characteristics have a crucial influence on short-term M&A performance. In doing so, we draw implications from our findings for the board of directors. At last, suggestions for further research are considered.

6.1. Implications for Corporate Governance

As outlined in the review of the theoretical background, acquiring firms having a poor corporate governance system experience lower abnormal returns compared to the ones with a good corporate governance system. The UK is assumed to have one of the best corporate governance systems being associated with a high level of operational and financial transparency as well as accountability towards shareholders and the public. Consequently, the internal governance system is expected to discipline CEOs in their execution of M&As and to support the accomplishment of only shareholder value-creating deals.

Coming back to the conceptual framework introduced at the beginning, we prove in this research study on a sample of 56 FTSE companies that CEO characteristics have a substantial influence on short-term CARs around the acquisition announcements. Precisely, we find that acquisitions undertaken by young CEOs have significantly weaker short-term performances than acquisitions undertaken by older CEOs. In contrast, acquisitions undertaken by long-tenured CEOs are negatively perceived by the stock market whereas the overall tenure of a CEO in a company has a positive, but statistically insignificant, effect. On average, a CEO holding an outside directorship, having previous CEO experience as well as being awarded with a double degree undertakes poorer acquisitions. Statistical significance can only be found for the influence of education. At last, the variable *ThreeOrMore*, as a proxy for high acquisitiveness, indicates that high order deals cause lower deal quality, revealed in lower abnormal stock returns around their announcement.

The observed CARs for our sample of 164 acquisitions confirm that, on average, M&As fail to achieve the goal of shareholder wealth maximisation. Therefore, we infer that corporate governance does not interfere enough to reduce the realisation of value-destroying acquisitions by CEOs. The results can be interpreted on the one side by the theory of agency costs, especially empire-building, and on the other side by the theory of hubris and overconfidence.

Based on the fact that the British governance system highly focuses on shareholder protection and reduction of agency costs, we conclude that the influence of overconfidence on M&A performance is superior, compared to imperfectly aligned contracts. The elimination of CEO duality, the requirement of independent board members and the separation of responsibilities throughout the board committees in the UK are all factors reducing a CEO's overall power and increasing the likelihood of well-aligned incentive contracts. Under the assumption of perfectly aligned incentives, our findings confirm that overconfident CEOs are likely to unintentionally undertake non value-creating acquisitions.

Therefore, we recommend that the board of directors improves its monitoring abilities to detect and counteract acquisitions driven by overconfident CEOs. Moreover, the advisory role of the board gains in importance due to our findings. The board should assist the CEO to undertake an objective and independent judgement of the value-creation of a potential acquisition. In addition to the board, our results also have implications for individual and institutional investors. As the board is responsible to represent shareholders' interests, the investors should be vigilant about the board's awareness of overconfidence in corporate decision-making.

Taking a closer look at the impact of the financial crisis of 2007/2008, we can identify that the influence of the CEO characteristics CEO tenure, CEO experience and outside directorship on M&A performance shifts from positive to negative. Thus, we concluded that the macro-financial crisis has caused a change in investor's perception. We assume that the market has increased its awareness and its ability to detect the influence of overconfidence on corporate decisions-making.

6.2. Further Research

Despite our reasoned findings, our study bears the weakness that we cannot certainly identify whether the influence of the considered variables is caused by empire-building motivations or by overconfidence. Therefore, further studies have to apply a valid and well-defined proxy for overconfidence to extract the overconfidence effect from the consequences of imperfectly aligned incentives. Moreover, the influence of the financial crisis on the effect of CEO characteristics on short-term M&A performance is not statistically significant. Consequently, we recommend the application of a broader acquisition sample and sub-samples should specifically cover the periods 'before', 'during' and 'after' the crisis. Additionally, the

application of another statistical regression model such as the logistic model can provide evidence whether the effect of several CEO characteristics on the likelihood of acquisitions has changed due to the financial crisis.

Besides, further research is recommended to be conducted with regards to specific corporate governance variables such as board size and board composition. The findings may display to which extent an independent board can determine the CEO's influence on M&A performance and if it can improve the average performance. A broader global acquisition sample enables the researcher to compare the effectiveness of different corporate governance systems. Furthermore, a global sample allows the verification of the influence of additional CEO characteristics on short-term M&A performance. For instance, determining the effect of a CEO's gender on acquisition activities is currently a vital topic and can contribute to the on-going discussion of women's performance in executive positions.

7. References

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Appendix A: Valid M&A deals

Company	Industry	Market Cap (millions GBP)	1% of Market cap	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions USD)	Exchange rate	Deal Size (millions GBP)
Aggreko PLC	Professional Services									
	<i>Market cap as of Dec 2011</i>	5,881	59	26.03.12	Merger	Cia Brasileira de Locacoes	Professional Services	255	0.6262	160
	<i>Market cap as of Dec 2005</i>	852	9	26.09.06	Acquisition of Assets	GE Energy Rentals Inc	Other Consumer Products	212	0.5873	124
Anglo American PLC	Metals & Mining									
	<i>Market cap as of Dec 2007</i>	41,643	416	17.01.08	Acquisition of Majority Assets	IronX Mineracao SA	Metals & Mining	3,493	0.5079	1,774
ARM Holdings PLC	Semiconductors									
	<i>Market cap as of Dec 2003</i>	1,216	12	23.08.04	Merger	Artisan Components Inc	Semiconductors	816	0.5533	451
Ashtead Group PLC	Other Consumer Products									
	<i>Market cap as of Apr 2013</i>	3,504	35	13.05.13	Acquisitions of Assets	Accession Group Ltd	Other Consumer Products	54	0.6537	35
Associated British Foods PLC	Food & Beverage									
	<i>Market cap as of Sep 2005</i>	6,421	64	19.05.06	Acquisitions of Majority Assets	Illovo Sugar Ltd	Food & Beverage	632	0.5327	337
	<i>Market cap as of Sep 2004</i>	5,661	57	11.07.05	Acquisition of Assets	Littlewoods Ltd	Discount & Department Store Retailing	717	0.5689	408
	<i>Market cap as of Sep 2003</i>	4,418	44	22.07.04	Acquisitions of Assets	Burns Philp & Co Ltd- International Yeast & Bakery Ingredients	Food & Beverage	1,350	0.5422	732
AstraZeneca PLC	Pharmaceuticals									
	<i>Market cap as of Dec 2012</i>	40,646	406	10.06.13	Merger	Pearl Therapeutics Inc	Biotechnology	1,150	0.6422	738
	<i>Market cap as of Dec 2011</i>	35,683	357	23.04.12	Merger	Ardea Biosciences Inc	Biotechnology	1,033	0.6201	641
	<i>Market cap as of Dec 2006</i>	43,056	431	23.04.07	Merger	Medimmune Inc	Biotechnology	14,681	0.5000	7,341
Babcock International Group PLC	Building/ Construction									
	<i>Market cap as of Mar 2009</i>	1,075	11	15.02.10	Merger	VT Group PLC	Automobiles & Components	2,184	0.6386	1,395
	<i>Market cap as of Mar 2009</i>	1,075	11	18.09.09	Acquisition of Assets	UKEA Ltd	Water and Waste Mgmt	81	0.6146	50
	<i>Market cap as of Mar 2008</i>	1,421	14	21.04.08	Acquisition of Assets	Weir Strachan & Henshaw LTD	Building/ Construction	129	0.5051	65
	<i>Market cap as of Mar 2007</i>	1,132	11	10.05.07	Acquisition of Assets	Devonport Management Ltd	Automobiles & Components	694	0.5050	351
	<i>Market cap as of Mar 2007</i>	1,132	11	04.04.07	Merger	International Nuclear Solutions PLC	Building/ Construction	39	0.5059	20
	<i>Market cap as of Mar 2006</i>	641	6	13.06.06	Acquisition of Assets	ABB South Africa- High Voltage Powerlines & Mobile Telecomes Unit	Other Energy & Power	8	0.5454	4
	<i>Market cap as of Mar 2006</i>	641	6	09.05.06	Acquisition of Assets	Alstec Group Ltd	Professional Services	83	0.5355	44
	<i>Market cap as of Mar 2004</i>	159	2	10.09.04	Acquisition of Assets	Turners & Partners Technical Services Ltd	Professional Services	21	0.5562	12
	<i>Market cap as of Mar 2003</i>	150	2	19.03.04	Merger	Peterhouse Group PLC	Building/ Construction	261	0.5457	142
BAE Systems PLC	Aerospace & Defense									
	<i>Market cap as of Dec 2009</i>	12,348	123	22.12.10	Acquisition of Assets	ETI A/S	Legal Services	211	0.6499	137
	<i>Market cap as of Dec 2009</i>	12,348	123	18.05.10	Acquisition of Assets	Atlantic Marine Holding Co	Automobiles & Components	352	0.6992	246
	<i>Market cap as of Dec 2003</i>	5,633	56	03.06.04	Merger	Alvis PLC	Aerospace & Defense	264	0.5434	143
BG Group PLC	Oil Gas									
	<i>Market cap as of Dec 2005</i>	25,234	252	28.12.06	Acquisition of Assets	Lake Road Power Plant	Power	685	0.5094	349
	<i>Market cap as of Dec 2003</i>	11,965	120	16.02.04	Acquisition of Assets	El Paso Oil & Gas Canada	Oil & Gas	346	0.5289	183
BHP Billiton PLC	Metals & Mining									
	<i>Market cap as of Jun 2011</i>	104,651	1047	14.07.11	Merger	Petrohawk Enegery Corp	Oil & Das	15,557	0.6193	9,635
BP PLC										
	<i>Market cap as of Dec 2009</i>	114,874	1149	11.03.10	Acquisition of Assets	Devon Energy Corp. Oil Assets	Oil & Gas	7,000	0.6639	4,647
British American Tobacco PLC	Tobacco									
	<i>Market cap as of Dec 2008</i>	31,972	320	17.06.09	Acquisition of Majority Assets	BentoeI Intarnasional Investama Tbk PT	Tobacco	645	0.6100	393
British Sky Broadcasting Group PLC	Cable									
	<i>Market cap as of Jun 2012</i>	12,309	123	01.03.13	Acquisition of Assets	Telefonica UK Ltd - O2 Broadband a& BE Telephony Business	Wireless	301	0.6653	200
	<i>Market cap as of Jun 2009</i>	9,493	95	04.06.10	Acquisition of Assets	Virgin Media Television	Broadcasting	231	0.6914	160
BT Group PLC	Telecommunication Services									
	<i>Market cap as of Mar 2004</i>	15,410	154	08.11.04	Merger	Infonet Services Corp	Software	574	0.5388	309
Bunzl PLC	Professional Services									
	<i>Market cap as of Dec 2003</i>	2,013	20	10.05.04	Acquisition of Assets	PLG Finances SA	Chemicals	391	0.5628	220

Company	Industry	Market Cap (millions GBP)	1% of Market cap	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions USD)	Exchange rate	Deal Size (millions GBP)
Burberry Group PLC	Textiles & Apparels									
	<i>Market cap as of Mar 2010</i>	3,465	35	16.07.10	Acquisition of Assets	Kwok Hang Holdings Ltd-China Stores (50)	Apparel Retailing	106	0.654	69
Capita PLC	Professional Services									
	<i>Market cap as of Dec 2012</i>	5,528	55	23.10.13	Acquisition of Assets	ParkingEye Ltd	IT Consulting & Services	95	0.6186	59
	<i>Market cap as of Dec 2012</i>	5,528	55	14.02.13	Acquisition of Assets	Northgate Managed Services Ltd	IT Consulting & Services	101	0.6456	65
	<i>Market cap as of Dec 2010</i>	4,441	44	23.12.11	Acquisition of Assets	Applied Language Solutions Ltd	Professional Services	105	0.6411	67
	<i>Market cap as of Dec 2010</i>	4,441	44	01.07.11	Acquisition of Assets	Club 24 Ltd	Telecommunication Services	104	0.6220	65
	<i>Market cap as of Dec 2009</i>	4,871	49	01.06.10	Merger	Premier Medical Group Ltd	Professional Services	88	0.6827	60
	<i>Market cap as of Dec 2008</i>	4,091	41	21.12.09	Acquisition of Assets	Synetrix (Holdings)	IT Consulting & Services	120	0.6230	75
	<i>Market cap as of Dec 2007</i>	4,096	41	05.06.08	Merger	IBS OPENSsystems PLC	Software	128	0.5107	65
Centrica PLC	Power									
	<i>Market cap as of Dec 2010</i>	17,174	172	21.11.11	Acquisitions of Assets	Statoil ASA- Norwegian Continental Shelf Assets (8)	Oil & Gas	1,624	0.6392	1,038
	<i>Market cap as of Dec 2006</i>	14,156	142	17.09.07	Merger	Newfield UK Holdings Ltd	Oil & Gas	483	0.5013	242
	<i>Market cap as of Dec 2004</i>	9,084	91	01.07.05	Acquisitions of Assets	Oxxio Nederland BV	Power	168	0.5659	95
	<i>Market cap as of Dec 2003</i>	8,723	87	08.06.04	Acquisitions of Assets	Killingholme Power Ltd-Power Station	Power	261	0.5446	142
Diageo PLC	Food & Beverage									
	<i>Market cap as of Jun 2010</i>	26,986	270	21.02.11	Acquisition of Assets	Mey Icki Sanyive Ticaret AS	Food & Beverage	2,095	0.6247	1,309
easyJet plc	Transportation & Infrastructure									
	<i>Market cap as of Sep 2007</i>	2,036	20	25.10.07	Merger	GB Airways Ltd	Transportation & Infrastructure	212	0.4875	103
Experian PLC	Professional Services (earlier Computers & Peripherals)									
	<i>Market cap as of Mar 2013</i>	12,055	121	06.11.13	Acquisition of Assets	Passport Health Communications Inc	IT Consulting & Services	850	0.6218	529
	<i>Market cap as of Mar 2011</i>	7,510	75	28.06.11	Acquisition of Assets	Medical Present Value Inc	Software	185	0.6250	116
	<i>Market cap as of Mar 2011</i>	7,510	75	03.05.11	Acquisition of Majority Assets	Comptec SA	Computer & Peripherals	382	0.6067	232
	<i>Market cap as of Mar 2010</i>	6,300	63	21.09.10	Acquisition of Assets	Mighty Net Inc	Computer & Peripherals	208	0.6406	133
	<i>Market cap as of Mar 2008</i>	4,030	40	10.12.08	Acquisition of Assets	Search America	Software	90	0.6761	61
G4S PLC	Professional Services									
	<i>Market cap as of Dec 2007</i>	2,940	29	04.06.08	Acquisition of Assets	Touchcom Inc	Professional Services	56	0.5116	29
	<i>Market cap as of Dec 2006</i>	2,665	27	18.12.07	Merger	Global Solutions Ltd (GSL)	Professional Services	718	0.4966	357
GKN PLC	Automotive/ Aerospace									
	<i>Market cap as of Dec 2011</i>	3,451	35	05.07.12	Acquisition of Assets	Volvo Aero AB	Aerospace & Defense	983	0.6441	633
	<i>Market cap as of Dec 2010</i>	3,260	33	28.07.11	Acquisition of Assets	Gertrag Corp	Automobiles & Components	483	0.6106	295
	<i>Market cap as of Dec 2010</i>	3,260	33	18.07.11	Merger	Stromag Holding GmbH	Automobiles & Components	275	0.6229	171
	<i>Market cap as of Dec 2007</i>	2,120	21	15.09.08	Acquisition of Assets	Airbus SAS-Wing Component & Sub-Assembly Manufacturing Site	Aerospace & Defense	245	0.5556	136
	<i>Market cap as of Dec 2005</i>	2,410	24	03.08.06	Acquisition of Assets	Rockford Powertrain Inc.	Electronics	50	0.5298	26
	<i>Market cap as of Dec 2003</i>	2,013	20	04.08.04	Merger	Velcon SA de CV	Automobiles & Components	83	0.5477	45
GlaxoSmithKline PLC	Pharmaceuticals									
	<i>Market cap as of Dec 2011</i>	70,678	707	19.04.12	Merger	Human Genome Sciences Inc	Biotechnology	3,269	0.6228	2,036
	<i>Market cap as of Dec 2008</i>	53,181	532	20.04.09	Merger	Stiefel Laboratories Inc	Pharmaceuticals	3,600	0.6884	2,478
	<i>Market cap as of Dec 2006</i>	79,390	794	21.11.07	Acquisitions of Assets	Reliant Pharmaceuticals Inc	Pharmaceuticals	1,650	0.4843	799
	<i>Market cap as of Dec 2004</i>	72,247	722	07.09.05	Merger	ID Biomedical Corp	Biotechnology	1,388	0.5444	756
IMI PLC	Machinery									
	<i>Market cap as of Dec 2012</i>	3,915	39	22.08.13	Acquisition of Assets	Analytical Flow Products	Other Industrial	64	0.6415	41
	<i>Market cap as of Dec 2009</i>	1,834	18	25.10.10	Acquisition of Assets	Z&J Technologies GmbH	Other Industrial	189	0.6356	120
	<i>Market cap as of Dec 2005</i>	1,989	20	06.03.06	Acquisition of Assets	Truflo Ltd	Machinery	211	0.5715	121
	<i>Market cap as of Dec 2004</i>	1,445	14	03.10.05	Acquisition of Assets	ABB KK-Control Valves Business	Other Energy & Power	35	0.5698	20
	<i>Market cap as of Dec 2004</i>	1,445	14	09.02.05	Acquisition of Assets	Syron Engineering & Manufacturing LLC	Professional Services	33	0.5380	18
Imperial Tobacco Group PLC	Tobacco									
	<i>Market cap as of Sep 2006</i>	13,682	137	08.02.07	Merger	Commonwealth Brands Inc	Tobacco	1,900	0.5107	970
	<i>Market cap as of Sep 2005</i>	12,401	124	30.08.06	Acquisition of Assets	Tchibo Holding AG- Davidoff cigarette global brand rights	Tobacco	693	0.5250	364

Company	Industry	Market Cap (millions GBP)	1% of Market cap	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions USD)	Exchange rate	Deal Size (millions GBP)	
Intertek Group PLC	Professional Services										
	<i>Market cap as of Dec 2012</i>	5,457	55	19.11.13	Acquisition of Assets	Architectural Testing Inc	Building/ Construction	95	0.6203	59	
	<i>Market cap as of Dec 2010</i>	3,030	30	07.03.11	Acquisition of Assets	Moody International Ltd	Professional Services	730	0.6172	451	
	<i>Market cap as of Dec 2007</i>	1,466	15	30.09.08	Merger	HP White Laboratory Inc	Professional Services	43	0.5609	24	
	<i>Market cap as of Dec 2007</i>	1,466	15	09.04.08	Acquisition of Assets	Hi-Cad technical Services Ltd	Software	33	0.5062	17	
	<i>Market cap as of Dec 2003</i>	746	7	10.05.04	Merger	Entela Inc.	Professional Services	24	0.5628	14	
itv plc	Broadcasting										
	<i>Market cap as of Dec 2004</i>	4,811	48	06.12.05	Acquisition of Assets	Friends Reunited	Internet Software	305	0.5742	175	
	<i>Market cap as of Dec 2004</i>	4,811	48	27.04.05	Acquisition of Assets	SDN Ltd	Broadcasting	285	0.5249	150	
J Sainsbury PLC	Food & Beverage Retailing										
	<i>Market cap as of Mar 2008</i>	5,514	55	04.03.09	Acquisitions of Assets	Co-operative Group Ltd-Stores (24)	Food & Beverage Retailing	181	0.7062	128	
Johnson Matthey PLC	Chemicals										
	<i>Market cap as of Mar 2012</i>	4,760	48	28.03.13	Acquisition of Assets	Formox AB	Chemicals	161	0.6581	106	
	<i>Market cap as of Mar 2012</i>	4,760	48	23.10.12	Merger	Axeon Holdings PLC	Automobiles & Components	65	0.6305	41	
	<i>Market cap as of Mar 2010</i>	3,292	33	06.10.10	Acquisition of Assets	Intecat Inc	Chemicals	56	0.6291	35	
	<i>Market cap as of Mar 2007</i>	3,806	38	10.12.07	Acquisition of Assets	Argillon GmbH	Electronics	315	0.4885	154	
	<i>Market cap as of Mar 2005</i>	2,149	21	01.02.06	Acquisition of Assets	Davy Process Technology Ltd	Chemicals	71	0.5636	40	
	<i>Market cap as of Mar 2003</i>	1,974	20	31.03.04	Acquisition of Assets	AMC Group of Cos	Pharmaceuticals	43	0.5417	23	
Marks and Spencer Group PLC	Discount & Department Store Retailing										
	<i>Market cap as of Mar 2004</i>	6,337	63	12.07.04	Acquisition of Assets	Per Una	Apparel Retailing	233	0.5371	125	
Meggitt PLC	Aerospace & Defense										
	<i>Market cap as of Dec 2010</i>	2,594	26	18.01.11	Acquisition of Assets	Pacific Scientific Aerospace	Machinery	685	0.6266	429	
	<i>Market cap as of Dec 2006</i>	1,302	13	06.03.07	Merger	K&F Industries Holdings Inc	Aerospace & Defense	1,807	0.5177	936	
Meggitt PLC	Aerospace & Defense										
	<i>Market cap as of Dec 2005</i>	1,447	14	13.09.06	Acquisition of Assets	Keith Products LP	Machinery	32	0.5328	17	
	<i>Market cap as of Dec 2003</i>	791	8	05.07.04	Acquisition of Assets	Dunlop Standard Aerospace Group-Design and Manufacturing Businesses	Aerospace & Defense	748	0.5464	409	
Mondi PLC	Paper & Forest Products										
		2,838	28	14.09.12	Acquisition of Assets	Duropack GmbH- Corrugated Box & Containerboard Operations	Containers & Packaging	164	0.6167	101	
National Grid PLC	Power										
	<i>Market cap as of Mar 2005</i>	14,068	141	27.02.06	Merger	KeySpan Corp	Oil & Gas	11,872	0.5748	6,825	
	<i>Market cap as of Mar 2004</i>	11,686	117	25.06.04	Acquisition of Assets	Crown Castle UK Ltd	Wireless	2,035	0.5474	1,114	
Pearson PLC	Publishing										
	<i>Market cap as of Dec 2011</i>	9,728	97	16.10.12	Acquisition of Assets	Embanet- Compass Knowledge Group	Other Consumer Products	650	0.6202	403	
	<i>Market cap as of Dec 2019</i>	8,637	86	21.11.11	Acquisition of Assets	Global Education & Technology Group Ltd	Educational Services	162	0.6392	104	
	<i>Market cap as of Dec 2010</i>	8,637	86	26.04.11	Acquisition of Assets	SchoolNet Inc	Internet Software	230	0.6067	140	
	<i>Market cap as of Dec 2010</i>	8,637	86	07.03.11	Merger	Education Development International PLC	Educational Services	166	0.6172	102	
	<i>Market cap as of Dec 2009</i>	8,297	83	22.07.10	Acquisition of Assets	Sistema Educacional Brasileiro SA- School Learning Systems Business	Educational Services	499	0.6555	327	
	<i>Market cap as of Dec 2009</i>	8,297	83	19.05.10	Acquisition of Majority Assets	Melorio PLC	Professiona Services	156	0.6918	108	
	<i>Market cap as of Dec 2008</i>	5,224	52	15.04.09	Merger	Wall Street English	Educational Services	145	0.6450	94	
	<i>Market cap as of Dec 2006</i>	6,925	69	04.05.07	Acquisition of Assets	Reed Elsevier Group PLC-Harcourt Education	Educational Services	952	0.5020	478	
	<i>Market cap as of Dec 2005</i>	6,263	63	08.08.06	Acquisition of Assets	Mergermarket	Computers & Peripherals	192	0.5242	101	
Persimmon PLC	Building/ Constructions										
	<i>Market cap as of Dec 2011</i>	1,996	20	08.10.12	Merger	Hiireed Homes Ltd	Other Real Estate	57	0.6241	36	
	<i>Market cap as of Dec 2004</i>	2,272	23	14.12.05	Merger	Senator Homes Ltd	Other Real Estate	44	0.5641	25	
	<i>Market cap as of Dec 2004</i>	2,272	23	14.11.05	Merger	Westbury PLC	Building/ Construction	1,571	0.5752	904	
Petrofac Ltd.	Oil & Gas										
	<i>Market cap as of Dec 2007</i>	2,158	22	29.08.08	Acquisition of Assets	Caltec Ltd	Oil & Gas	55	0.5490	30	
	<i>Market cap as of Dec 2007</i>	2,158	22	25.07.08	Acquisition of Assets	Eclipse Petroleum Technology Ltd	Building/ Construction	46	0.5023	23	
Randgold Resources Ltd.	Metals & Mining										
	<i>Market cap as of Dec 2008</i>	2,358	24	16.07.09	Merger	Moto Goldmines Ltd	Metals & Mining	523	0.6081	318	
Reckitt Benckiser Group PLC.	Households & Personal Products										
	<i>Market cap as of Dec 2011</i>	25,787	258	15.11.12	Merger	Schiff Nutrition International Inc	Pharmaceuticals	1,434	0.6305	904	
	<i>Market cap as of Dec 2009</i>	25,175	252	13.12.10	Merger	Paras Pharmaceuticals Ltd	Pharmaceuticals	722	0.6308	455	

Company	Industry	Market Cap (millions GBP)	1% of Market cap	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions USD)	Exchange rate	Deal Size (millions GBP)
Reckitt Benckiser Group PLC.	Market cap as of Dec 2009	25,175	252	21.07.10	Merger	SSL International PLC	Healthcare Equipment	3,872	0.6549	2,536
	Market cap as of Dec 2006	18,982	190	10.12.07	Merger	Adams Respiratory Therapeutics Inc	Pharmaceuticals	2,234	0.4885	1,091
	Market cap as of Dec 2004	12,064	121	07.10.05	Acquisitions of Assets	Boots Healthcare International	Pharmaceuticals	3,427	0.5678	1,946
Reed Elsevier PLC	Publishing									
	Market cap as of Dec 2010	6,588	66	26.09.11	Merger	Accuity Inc	Computers & Peripherals	531	0.6428	341
	Market cap as of Dec 2007	6,830	68	21.02.08	Merger	ChoicePoint Inc	IT Consulting & Services	4,380	0.5093	2,231
Rexam PLC	Containers & Packaging									
	Market cap as of Dec 2006	3,182	32	04.07.07	Acquisition of Assets	Rostar	Containers & Packaging	297	0.4959	147
	Market cap as of Dec 2006	3,182	32	08.06.07	Merger	OI Plastic Products FTS Inc	Containers & Packaging	1,825	0.5075	926
Rio Tinto PLC	Metals & Mining									
	Market cap as of Dec 2009	71,722	717	06.12.10	Merger	Riversdale Mining Ltd	Metals & Mining	3,661	0.6365	2,330
	Market cap as of Dec 2004	2,513	25	14.11.05	Merger	Precise Technology Inc	Chemicals	257	0.5752	148
SAB Miller PLC	Consumer Products									
	Market cap as of Mar 2007	19,855	199	19.11.07	Merger	Koninklijke Grolsch NV	Food & Beverage	1,286	0.4879	628
	Market cap as of Mar 2005	11,378	114	19.07.05	Acquisition of Majority Assets	Bavaria SA	Food & Beverage	5,227	0.5746	3,003
Shire PLC	Pharmaceuticals									
	Market cap as of Dec 2012	11,862	119	08.01.13	Merger	Lotus Tissue Repair Inc	Biotechnology	324	0.6228	202
	Market cap as of Dec 2011	12,292	123	15.03.12	Acquisition of Assets	Ferrokin Biosciences Inc	Biotechnology	325	0.6365	207
Smith & Nephew PLC	Healthcare Equipment									
	Market cap as of Dec 2011	5,649	56	28.11.12	Acquisition of Assets	Healthpoint Biotherapeutics Ltd	Biotechnology	782	0.6244	488
	Market cap as of Dec 2006	6,107	61	12.03.07	Acquisition of Assets	Plus Orthopedics AG	Healthcare Equipment	881	0.5174	456
Sports Direct International PLC	Other Retailing									
	Market cap as of Apr 2009	536	5	07.08.09	Acquisition of Assets	JJB Sports PLC- Stores (20)	Other Retailing	39	0.5994	23
	Market cap as of Dec 2003	1,508	15	16.12.04	Acquisition of Assets	Wickes Ltd	Home Improvement Retailing	1,834	0.5178	950
The Sage Group PLC	Software									
	Market cap as of Sep 2005	3,422	34	09.01.06	Acquisition of Assets	Verus Financial Management Inc	Computers & Peripherals	325	0.5667	184
	Market cap as of Dec 2009	55,999	560	27.09.10	Merger	Alberto-Culver Co	Other Consumer Products	3,728	0.6317	2,355
Travis Perkins PLC	Construction Materials									
	Market cap as of Dec 2009	1,513	15	28.05.10	Merger	The BSS Group PLC	Building/ Construction	924	0.6913	639
	Market cap as of Dec 2007	1,229	12	07.04.08	Merger	Toolstation Ltd	Building/ Construction	38	0.5030	19
Tullow Oil PLC	Oil & Gas									
	Market cap as of Dec 2011	13,159	132	11.12.12	Acquisition of Assets	Spring Energy Norway AS	Oil & Gas	672	0.6207	417
	Market cap as of Dec 2010	12,958	130	24.05.11	Acquisition of Assets	Nuon Exporation & Production BV (Nuon E&P)	Oil & Gas	423	0.6179	261
Unilever PLC	Food & Beverage									
	Market cap as of Dec 2009	55,999	560	27.09.10	Merger	Alberto-Culver Co	Other Consumer Products	3,728	0.6317	2,355
	Market cap as of Dec 2008	35,310	353	25.09.09	Acquisition of Assets	Sara Lee Corp-European Household and Personal Care Business	Household & Personal Products	1,873	0.6268	1,174
Vodafone Group PLC	Wireless									
	Market cap as of Mar 2008	82,552	826	09.02.09	Merger	Hutchison Telecommunication (Australia) Ltd-Telecommun Bus	Wireless	2,456	0.6708	1,648
	Market cap as of Mar 2005	87,811	878	13.12.05	Acquisitions of assets	TELSIM Mobil Telekomunikasyon Hizmetleri AS	Wireless	4,557	0.5651	2,575
Weir Group PLC	Machinery									
	Market cap as of Dec 2011	4,446	44	25.01.12	Acquisitions of assets	Novatech LLC	Other industrials	176	0.6385	112
	Market cap as of Dec 2010	3,640	36	23.11.11	Acquisitions of assets	Seaboard Holdings Inc	Oil & Gas	675	0.6445	435
Weir Group PLC	Machinery									
	Market cap as of Dec 2009	2,039	20	14.06.10	Merger	Linatex Consolidated Holdings Ltd.	Other industrials	202	0.6783	137
	Market cap as of Dec 2007	1,554	16	24.06.08	Acquisition of assets	Mesa Manufacturing Inc.	Other industrials	40	0.5073	20

Company	Industry	Market Cap (millions GBP)	1% of Market cap	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions USD)	Exchange rate	Deal Size (millions GBP)
Weir Group PLC	Market cap as of Dec 2006	1,276	13	04.12.07	Acquisition of assets	CH Warman Pump Group	Machinery	231	0.4856	112
	Market cap as of Dec 2006	1,276	13	21.06.07	Merger	SPM Flow Control Inc.	Oil & Gas	653	0.5018	328
Whitbread PLC	Food & Beverage Retailing									
	Market cap as of Feb 2009	1,559	16	11.12.09	Merger	coffeeheaven international PLC	Food & Beverage Retailing	57	0.6153	35
	Market cap as of Feb 2007	3,744	37	26.09.07	Acquisition of assets	Golden Tulip (UK) Ltd.	Hotels & Lodging	89	0.4959	44
William Hill PLC	Recreation & Leisure									
	Market cap as of Dec 2012	3,127	31	20.03.13	Acquisition of Assets	Sportingbet PLC- Australien Business	Casinos & Gaming	687	0.6622	455
	Market cap as of Dec 2010	1,339	13	14.04.11	Acquisition of Assets	Sierre Development Co-Club Cal Neva Sateelite Race & Sportsbook Div	Casinos & Gaming	22	0.6116	13
	Market cap as of Dec 2004	2,517	25	16.05.05	Acquisition of Assets	Stanley Leisure PLC- Retail Bookmarking European Operations	Casinos & Gaming	953	0.5441	519
Wolseley PLC	Building & Constructions									
	Market cap as of Jul 2006	7,400	74	02.10.06	Acquisitions of Assets	Castle Group	Building/ Construction	209	0.5299	111
	Market cap as of Jul 2005	7,011	70	24.07.06	Acquisitions of Assets	DT Groups A/S	Home Improvement Retailing	2,536	0.5401	1,370
	Market cap as of Jul 2005	7,011	70	31.10.05	Acquisitions of Assets	William Wilson Holdings Ltd	Building/ Construction	143	0.5649	81
	Market cap as of Jul 2003	4,208	42	30.07.04	Acquisitions of Assets	Brooks Group Ltd	Construction Materials	256	0.5494	141
WPP PLC	Advertising & Marketing									
	Market cap as of Dec 2007	7,160	72	29.09.08	Exchange Offer	WPP Group PLC	Advertising & Marketing	12,380	0.5531	6,848
	Market cap as of Dec 2006	9,286	93	17.05.07	Merger	24/7 Real Media Inc.	Internet Software	600	0.4915	295
	Market cap as of Dec 2005	6,543	65	13.09.04	Merger	Grey Global Group Inc.	Advertising & Marketing	1,238	0.5564	689

Appendix B: Excluded companies

Company	Industry	Reason
Aberdeen Asset Mgmt.	Fund Management	Financial Institution
Admiral Group PLC	Insurance	Financial Institution
Antofagasta PLC	Metals & Mining	No valid M&As in defined sample period according to specified criteria (acquisition through subsidiary)
Avivia PLC	Insurance	Financial Institution
Barclays PLC	Banking	Financial Institution
Barratt Developments PLC	Property	Property Development and Investment Firm
British Land Company PLC	Property	Property Development and Investment Firm
Carnival PLC	Leisure	No M&A activities in the defined sample period
Cocacola HBC AG (Coca-Cola Hellenic Bottling Company SA)	Food & Beverages	No market capitalization reported on Thomson Reuters Eikon
Compass Group PLC	Food & Beverage Retailing	No valid M&As in defined sample period according to specified
CRH PLC	Construction Materials	Only market data of Irish Stock Exchange (ISE) available
Fresnillo PLC		No M&A activities in the defined sample period
Glencore Xstrata PLC	Metals & Mining	No valid M&As in defined sample period according to specified criteria (no majority stake)
Hammerson PLC	Property	Property Development and Investment Firm
Hargreaves Lansdown PLC	Finance	Financial Institution
HSBC Holdings PLC	Banking	Financial Institution
InterContinental Hotels Group SA	Travel, Lodging & Dining	No M&A activities in the defined sample period
International Consolidated Airlines Group SA	Transportation & Infrastructure	No market capitalization reported on Thomson Reuters Eikon (Company listed in 2011)
Kingfisher PLC	Home Improvement Retailing	No valid M&As in defined sample period according to specified criteria (no disclosed deal value)
Land Securities Group PLC	Property	Property Development and Investment Firm
Legal & General Group PLC	Insurance	Financial Institution
Lloyds Banking Group PLC	Banking	Financial Institution
London Stock Exchange Group	Finance	Financial Institution
New Melrose	Investment fund	Financial Institution
Next PLC	Advertising & Marketing	No valid M&As in defined sample period according to specified criteria (no large enough deal values)
Old Mutual PLC	Insurance	Financial Institution
Prudential PLC	Finance	Financial Institution
Resolution Ltd.	Investment	Financial Institution
Rolls-Royce Holdings PLC	Machinery	No valid M&As in defined sample period according to specified criteria (no large enough deal values)
Royal Bank of Scotland Group PLC	Banking	Financial Institution
Royal Dutch Shell PLC	Oil & Gas	Only market data of Euronext available
Royal Mail	Postal services, courier	No M&A activities in the defined sample period
RSA Insurance Group PLC	Insurance	Financial Institution
Schroders PLC	Fund Management	Financial Institution
Severn Trent PLC	Utilities	No M&A activities reported on Thomson Reuters Eikon
Smiths Group PLC	Machinery	No M&A activities reported on Thomson Reuters Eikon
SSE PLC	Utilities	No M&A activities reported on Thomson Reuters Eikon
St. James's Place PLC	Wealth management	Financial Institution
Standard Chartered PLC	Banking	Financial Institution
Standard Life PLC	Fund Management	Financial Institution
Tesco PLC	Food & Beverage Retailing	No valid M&As in defined sample period according to specified criteria (no large enough deal values)
TUI Travel PLC	Travel Services	No valid M&As in defined sample period according to specified criteria (no large enough deal values)
United Utilities Group PLC	Utilities	No M&A activities reported on Thomson Reuters Eikon
WM Morrison Supermarkets PLC	Food & Beverage Retailing	No valid M&As in defined sample period according to specified criteria (no large enough deal values); no market data available

Appendix C: Excluded M&A deals

Company	Industry	Announcement date	Form of Transaction	Target	Industry	Deal Size (millions GBP)	Reason
BG Group PLC	Oil Gas	09.02.09	Merger	Pure Energy Resource Ltd	Oil & Gas	479	Subsidiary 'BG International (AUS) Pty Ltd.' of acquiring company 'BG Group plc' acquired the target firm.
BG Group PLC	Oil Gas	28.10.08	Merger	Queensland Gas Co Ltd	Oil & Gas	1,770	Subsidiary 'BG International (AUS) Pty Ltd.' of acquiring company 'BG Group plc' acquired the target firm.
British American Tobacco PLC	Tobacco	28.02.08	Merger	House of Prince A/S	Tobacco	1,961	Two acquisitions announcements within a short-time period (less than one week inbetween)
British American Tobacco PLC	Tobacco	22.02.08	Acquisition of Assets	Tutun Tutun Mamulleri tuz ve Alkol Isletmeleri AS	Tobacco	874	Two acquisitions announcements within a short-time period (less than one week inbetween)
Capita PLC	Professional Services	23.12.10	Acquisition of Assets	SunGard Public Sector Ltd	Professional Services	86	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
Capita PLC	Professional Services	23.12.10	Acquisition of Assets	BSI Holdings Ltd	Travel Services	43	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
G4S PLC	Professional Services	23.11.09	Acquisition of Assets	Champions of the West Inc	Professional Services	36	Two acquisitions announcements within a short-time period (less than one week inbetween)
G4S PLC	Professional Services	17.11.09	Acquisition of Assets	Adesta LLC, Adesta LP	IT Consulting & Services	39	Two acquisitions announcements within a short-time period (less than one week inbetween)
IMI PLC	Machinery	17.02.12	Acquisition of Assets	Interativa Industria Comercio e Representacoes Ltda	Other Industrial	43	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
IMI PLC	Machinery	16.02.12	Acquisition of Assets	Remosa SpA	Other Industrial	83	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
		19.11.05	Acquisition of Assets	GT Development Corp.	Machinery	16	No stock return data for IMI plc and FTSE All-Share index available for the 19.11.05
Meggitt PLC	Aerospace & Defense	14.11.04	Acquisition of Assets	Wilcoxon Research Inc.	Other Industrials	9	No stock return data for Meggitt and FTSE All-Share index available for the 14.11.04
Rexam PLC	Containers & Packaging	30.01.06	Merger	Egyptian Can making Co (Enaco)	Containers & Packaging	60	Two acquisitions announcements within a short-time period (less than one week inbetween)
Rexam PLC	Containers & Packaging	25.01.06	Acquisition of Assets	Fang Xin Ltd	Containers & Packaging	41	Two acquisitions announcements within a short-time period (less than one week inbetween)
SAB Miller PLC	Consumer Products	09.10.07	Merger	Molson Coors Brewing Co- US & Puerto Rican Operations	Food & Beverage	1,275	SABMiller PLC merged its US & Puerto Rican operations with the US operations of Molson Coors Brewing Co to form a Joint Venture
Vodafone Group PLC	Wireless	11.02.2007	Acquisitions of majority assets	Hutchison Essar Ltd.	Telecommunications Services	6,537	No stock return data for Vodafone Group plc and FTSE All-Share index available for the 11.02.2007
Weir Group PLC	Machinery	15.08.2005	Merger	Pompe Gabbioneta SpA	Machinery	68	No fiscal year end data of 2004 (year prior the acquisition announcement) available
Whitbread PLC	Food & Beverage Retailing	23.07.2004	Acquisition of assets	Premier Lodge Hotels	Hotels & Lodging	508	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
Whitbread PLC	Food & Beverage Retailing	23.07.2004	Acquisition of assets	Spirit Group Ltd. Pubs. (UK)	Food & Beverage Retailing	32	Two acquisitions announcements on the same day resulting in an overlapping event window (-1, +1)
WM Morrison Supermarkets PLC	Food & Beverage Retailing	22.10.2005	Acquisitions of Assets	Encon Insulation Ltd	Building/ Construction	141	No stock return data for WM Morrison Supermarkets plc and FTSE All-Share index available for the 22.10.2005
WPP PLC	Advertising & Marketing	04.05.2008	Merger	Taylor Nelson Sofres. PLC	Professional Services	1,442	No stock return data for WPP plc and FTSE All-Share index available for the 04.05.08

Appendix D: CEO characteristics

Company	Acquisition Announcement date	CEO	Age at M&A	CEO since	CEO tenure (until M&A)	Firm since	Firm tenure (until M&A)	CEO experience	Other board memberships	Education	Sources
Aggreko PLC	26.03.12	Rupert C. Soames	52	July 2003	9	July 2003	9	no	yes	unknown	Annual report 2010, 2008, 2006; Bloomberg BusinessWeek
	26.09.06	Rupert C. Soames	46	July 2003	3	July 2003	3	no	no	unknown	Annual report 2010, 2008, 2006; Bloomberg BusinessWeek
Anglo American PLC	17.01.08	Cynthia Carroll	51	March 2007	1	January 2007	1	yes	yes	both	Annual report 2008; Bloomberg BusinessWeek
ARM Holdings PLC	23.08.04	D. Warren East	42	October 2001	3	January 2004	10	no	no	both	Annual report 2004; Bloomberg BusinessWeek
Ashtead Group PLC	13.05.13	Geoffrey Drabble	53	January 2007	6	01.04.05	8	no	no	business	Annual report 2008, 2012; Bloomberg BusinessWeek
Associated British Foods	19.05.06	George Garfield Weston	41	April 2005	1	1988	18	yes	no	business	Annual 2012; Bloomberg BusinessWeek
	11.07.05	George Garfield Weston	40	April 2005	0	1988	17	yes	no	business	Annual 2012; Bloomberg BusinessWeek
	22.07.04	Peter J. Jackson	57	June 1999	5	1992	12	yes	yes	business	Annual report 2004; Bloomberg BusinessWeek; http://archive.today/v3i8F (accessed: 03/05/2014)
AstraZeneca PLC	10.06.13	Pascal Soriot	53	October 2012	1	October 2012	1	yes	no	both	Annual 2012; Bloomberg BusinessWeek
	23.04.12	David R. Brennan	58	January 2006	6	1999	37	no	yes	business	Annual report 2011, 2007; Bloomberg BusinessWeek
	23.04.07	David R. Brennan	54	January 2006	1	1999	32	no	yes	business	Annual report 2011, 2007; Bloomberg BusinessWeek
Babeck International Group PLC	15.02.10	Peter L. Rogers	61	August 2003	7	June 2002	8	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	18.09.09	Peter L. Rogers	61	August 2003	6	June 2002	7	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	21.04.08	Peter L. Rogers	60	August 2003	5	June 2002	6	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	10.05.07	Peter L. Rogers	59	August 2003	4	June 2002	5	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	04.04.07	Peter L. Rogers	59	August 2003	4	June 2002	5	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	13.06.06	Peter L. Rogers	58	August 2003	3	June 2002	4	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	09.05.06	Peter L. Rogers	58	August 2003	3	June 2002	4	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	10.09.04	Peter L. Rogers	56	August 2003	1	June 2002	2	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	19.03.04	Peter L. Rogers	55	August 2003	1	June 2002	2	yes	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	BAE Systems PLC	22.12.10	Ian King	53	September 2008	2	2001	9	yes	yes	unknown
18.05.10		Ian King	53	September 2008	2	2001	9	yes	yes	unknown	Annual report 2010, 2008; Bloomberg BusinessWeek
03.06.04		Mike Turner	56	2002	2	1999	5	no	yes	technical	Annual report 2003; Bloomberg BusinessWeek
BG Group PLC	28.12.06	Francis Chapman	52	October 2000	6	November 1996	10	no	yes	technical	Annual report 2006; Bloomberg BusinessWeek
	16.02.04	Francis Chapman	50	October 2000	4	November 1996	8	no	yes	technical	Annual report 2006; Bloomberg BusinessWeek
BHP Billiton PLC	14.07.11	Marius J. Kloppers	49	October 2007	4	1993	18	no	no	both	Annual report 2011; Bloomberg BusinessWeek
BP PLC	11.03.10	Anthony B. Hayward	52	May 2007	3	1982	28	no	yes	technical	Annual report 2009; Bloomberg BusinessWeek
British American Tobacco PLC	17.06.09	Paul Adams	55	January 2004	5	July 1991	18	no	no	business	Annual report 2008, 2009; Bloomberg BusinessWeek; http://www.independent.co.uk/news/people/profiles/paul-adams-addicted-to-innovation-addicted-to-growth-but-not-addicted-to-fags-404415.html (accessed: 03/05/2014)
British Sky Broadcasting Group PLC	01.03.13	Jeremy Darroch	50	December 2007	6	August 2004	9	no	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
	04.06.10	Jeremy Darroch	47	December 2007	3	01.08.04	6	no	yes	business	Annual report 2012, 2010; Bloomberg BusinessWeek
BT Group PLC	08.11.04	Bernardus J. W. Verwaayer	52	February 2002	2	January 2002	2	yes	no	other	Annual report 2004; Bloomberg BusinessWeek
Bunzl PLC	10.05.04	Anthony John Habgood	57	1991	13	January 1991	13	yes	yes	business	Annual report 2007; Bloomberg BusinessWeek
Burberry Group PLC	16.07.10	Angela Ahrendts	50	July 2006	4	January 2006	4	no	no	business	Annual report 2012; Bloomberg BusinessWeek; http://www.telegraph.co.uk/finance/newsbysector/retailandconsumer/10379243/Angela-Ahrendts-Profile.html (accessed: 04/05/2014)
Capita PLC	23.10.13	Paul R. M. Pindar	53	1999	14	1987	26	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	14.02.13	Paul R. M. Pindar	53	1999	14	1987	26	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	23.12.11	Paul R. M. Pindar	51	1999	12	1987	24	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	01.07.11	Paul R. M. Pindar	51	1999	12	1987	24	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	01.06.10	Paul R. M. Pindar	50	1999	11	1987	23	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	21.12.09	Paul R. M. Pindar	49	1999	10	1987	22	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
	05.06.08	Paul R. M. Pindar	48	1999	9	1987	21	no	yes	business	Annual report 2008, 2007; Bloomberg BusinessWeek
Centrica PLC	21.11.11	Samuel Laidlaw	55	July 2006	5	July 2006	5	yes	yes	business	Annual report 2007; Bloomberg BusinessWeek
	17.09.07	Samuel Laidlaw	51	July 2006	1	July 2006	1	yes	yes	business	Annual report 2007; Bloomberg BusinessWeek
	01.07.05	Roy A. Gardner	59	1997	8	1997	8	no	yes	business	Annual report 2005; Bloomberg BusinessWeek
	08.06.04	Roy A. Gardner	58	1997	7	1997	7	no	yes	business	Annual report 2005; Bloomberg BusinessWeek
Diageo	21.02.11	Paul Steven Walsh	56	September 2000	11	1997	14	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek; http://www.thecompleteuniversityguide.co.uk/manchester-metropolitan (accessed: 04/05/2014)
easyJet plc	25.10.07	Andrew Harrison	50	December 2005	2	November 2005	2	yes	yes	business	Annual report 2008; Bloomberg BusinessWeek
Experian PLC	06.11.13	Donald Robert	53	February 2005	8	2001	12	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek
	28.06.11	Donald Robert	51	February 2005	6	2001	10	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek
	03.05.11	Donald Robert	51	February 2005	6	2001	10	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek
	21.09.10	Donald Robert	50	February 2005	5	2001	9	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek
	10.12.08	Donald Robert	48	February 2005	3	2001	7	yes	yes	business	Annual report 2012; Bloomberg BusinessWeek
G4S PLC	04.06.08	Nick Buckles	47	July 2005	3	2004	4	yes	yes	business	Annual report 2008; Bloomberg BusinessWeek; http://www.independent.co.uk/news/people/profiles/nick-buckles-the-security-supremo-at-large-466268.html (accessed: 27/04/2014)
	18.12.07	Nick Buckles	46	July 2005	2	2004	3	yes	yes	business	Annual report 2008; Bloomberg BusinessWeek; http://www.independent.co.uk/news/people/profiles/nick-buckles-the-security-supremo-at-large-466268.html (accessed: 27/04/2014)
GKN PLC	05.07.12	Nigel Stein	56	January 2012	0	1994	18	no	yes	technical	Annual report 2012; Bloomberg BusinessWeek
	28.07.11	Kevin Smith	56	January 2003	8	1999	12	no	yes	business	Annual report 2010; Bloomberg BusinessWeek; http://files.shareholder.com/downloads/AMDA-IQL9S/0x0x51047469-13-4709/1544175/filing.pdf (accessed: 27/04/2014)
	18.07.11	Kevin Smith	56	January 2003	8	1999	12	no	yes	business	Annual report 2010; Bloomberg BusinessWeek; http://files.shareholder.com/downloads/AMDA-IQL9S/0x0x51047469-13-4709/1544175/filing.pdf (accessed: 27/04/2014)
	15.09.08	Kevin Smith	53	January 2003	5	1999	9	no	yes	business	Annual report 2010; Bloomberg BusinessWeek; http://files.shareholder.com/downloads/AMDA-IQL9S/0x0x51047469-13-4709/1544175/filing.pdf (accessed: 27/04/2014)
	03.08.06	Kevin Smith	51	January 2003	3	1999	7	no	yes	business	Annual report 2010; Bloomberg BusinessWeek; http://files.shareholder.com/downloads/AMDA-IQL9S/0x0x51047469-13-4709/1544175/filing.pdf (accessed: 27/04/2014)
GlaxoSmithKline PLC	04.08.04	Kevin Smith	49	January 2003	1	1999	5	no	yes	business	Annual report 2010; Bloomberg BusinessWeek; http://files.shareholder.com/downloads/AMDA-IQL9S/0x0x51047469-13-4709/1544175/filing.pdf (accessed: 27/04/2014)
	19.04.12	Andrew Philip Witty	47	May 2008	4	2000	11	no	yes	business	Annual report 2012; Bloomberg BusinessWeek; http://www.gsk.com/about-us/our-history.html (accessed: 27/04/2014)

Company	Acquisition Announcement date	CEO	Age at M&A	CEO since	CEO tenure (until M&A)	Firm since	Firm tenure (until M&A)	CEO experience	Other board memberships	Education	Sources
Rexam PLC	04.07.07	Leslie van de Walle	50	February 2007	0	January 2007	0	yes	yes	business	Annual report 2006; Bloomberg BusinessWeek
	08.06.07	Leslie van de Walle	50	February 2007	0	January 2007	0	yes	yes	business	Annual report 2006; Bloomberg BusinessWeek
	14.11.05	Lars Emilson	63	October 2004	1	2000	5	yes	no	business	Annual report 2004; Bloomberg BusinessWeek
	06.09.05	Lars Emilson	63	October 2004	1	2000	5	yes	no	business	Annual report 2004; Bloomberg BusinessWeek
Rio Tinto PLC	06.12.10	Tom Albanese	52	May 2007	3	1993	17	no	yes	both	Annual report 2009; Bloomberg BusinessWeek
SAB Miller PLC	19.11.07	Graham Mackay	57	1999	8	1978	29	no	yes	both	Annual report 2007; Bloomberg BusinessWeek; http://www.sabmiller.com/index.asp?pageid=356 (accessed: 21.04.2014)
	19.07.05	Graham Mackay	55	1999	6	1978	27	no	yes	both	Annual report 2007; Bloomberg BusinessWeek; http://www.sabmiller.com/index.asp?pageid=356 (accessed: 21.04.2014)
Shire PLC	08.01.13	Angus Russell	57	June 2008	5	December 1999	14	no	yes	business	Annual report 2012; Bloomberg BusinessWeek
	15.03.12	Angus Russell	56	June 2008	4	December 1999	13	no	yes	business	Annual report 2012; Bloomberg BusinessWeek
	17.05.11	Angus Russell	55	June 2008	3	December 1999	12	no	yes	business	Annual report 2012; Bloomberg BusinessWeek
	30.06.10	Angus Russell	54	June 2008	2	December 1999	11	no	yes	business	Annual report 2012; Bloomberg BusinessWeek
	20.02.07	Matthew Emmens	55	March 2003	4	March 2003	4	yes	yes	business	Annual report 2006; Bloomberg BusinessWeek
21.04.05	Matthew Emmens	53	March 2003	2	March 2003	2	yes	yes	business	Annual report 2006; Bloomberg BusinessWeek	
Smith & Nephew PLC	28.11.12	Olivier Bohuon	53	April 2011	1	April 2011	1	yes	yes	both	Annual report 2012; Bloomberg BusinessWeek
	12.03.07	Christopher O'Donnell	60	July 1997	10	1988	19	no	yes	technical	Annual report 2006; Bloomberg BusinessWeek
Sports Direct International PLC	07.08.09	David Forsey	43	May 2001	8	1984	25	no	yes	unknown	Annual report 2009; Bloomberg BusinessWeek; http://www.sportsdirectplc.com/about-us/leadership.aspx (accessed: 27.04.2014)
The Sage Group PLC	09.01.06	Paul Walker	48	1994	12	1984	22	no	yes	business	Annual report 2006; Bloomberg BusinessWeek
Travis Perkins PLC	28.05.10	Geoff Cooper	55	March 2005	5	February 2005	5	no	yes	business	Annual report 2009; Bloomberg BusinessWeek
	07.04.08	Geoff Cooper	53	March 2005	3	February 2005	3	no	yes	business	Annual report 2009; Bloomberg BusinessWeek
	16.12.04	Frank MacKay	58	January 2000	4	November 1999	5	no	yes	unknown	Annual report 2003; Bloomberg BusinessWeek
Tullow Oil PLC	11.12.12	Aidan Heavey	58	1985	27	1985	27	no	yes	business	Annual report 2011; Bloomberg BusinessWeek
	24.05.11	Aidan Heavey	57	1985	26	1985	26	no	yes	business	Annual report 2011; Bloomberg BusinessWeek
	25.09.06	Aidan Heavey	52	1985	21	1985	21	no	yes	business	Annual report 2011; Bloomberg BusinessWeek
	20.12.04	Aidan Heavey	50	1985	19	1985	19	no	yes	business	Annual report 2011; Bloomberg BusinessWeek
	26.03.04	Aidan Heavey	50	1985	19	1985	19	no	yes	business	Annual report 2011; Bloomberg BusinessWeek
Unilever PLC	27.09.10	Paul Polman	53	January 2009	1	November 2008	2	no	yes	business	Annual report 2009; Bloomberg BusinessWeek
	25.09.09	Paul Polman	52	January 2009	0	November 2008	1	no	yes	business	Annual report 2009; Bloomberg BusinessWeek
Vodafone Group PLC	09.02.09	Vittorio Colao	46	July 2008	1	1996	13	yes	yes	business	Annual report 2008; Bloomberg BusinessWeek
	13.12.05	Arun Sarin	50	July 2003	2	June 1999	6	yes	yes	technical	Annual report 2004; Bloomberg BusinessWeek
	04.11.05	Arun Sarin	50	July 2003	2	June 1999	6	yes	yes	technical	Annual report 2004; Bloomberg BusinessWeek
	15.03.05	Arun Sarin	49	July 2003	2	June 1999	6	yes	yes	technical	Annual report 2004; Bloomberg BusinessWeek
Weir Group PLC	25.01.12	Keith Cochrane	47	September 2009	3	July 2006	6	yes	yes	business	Annual report 2011; Bloomberg BusinessWeek
	23.11.11	Keith Cochrane	46	September 2009	2	July 2006	5	yes	yes	business	Annual report 2011; Bloomberg BusinessWeek
	14.06.10	Keith Cochrane	45	September 2009	1	July 2006	4	yes	yes	business	Annual report 2011; Bloomberg BusinessWeek
	24.06.08	Mark Selway	48	June 2001	7	June 2001	7	no	yes	technical	Annual report 2007; Bloomberg BusinessWeek
	04.12.07	Mark Selway	47	June 2001	6	June 2001	6	no	yes	technical	Annual report 2007; Bloomberg BusinessWeek
	21.06.07	Mark Selway	47	June 2001	6	June 2001	6	no	yes	technical	Annual report 2007; Bloomberg BusinessWeek
Whitbread PLC	11.12.09	Alan Parker	62	June 2004	5	1992	17	no	yes	business	Annual report 2009, 2008; Bloomberg BusinessWeek
	26.09.07	Alan Parker	60	June 2004	3	1992	15	no	yes	business	Annual report 2009, 2008; Bloomberg BusinessWeek
William Hill PLC	20.03.13	Ralph Topping	60	February 2008	5	1973	40	no	yes	unknown	Annual report 2012; Bloomberg BusinessWeek; http://www.independent.co.uk/news/business/analysis-and-features/the-business-onralph-topping-chief-executive-william-hill-2226114.html (accessed: 26.04.2014)
	14.04.11	Ralph Topping	58	February 2008	3	1973	38	no	yes	unknown	Annual report 2012; Bloomberg BusinessWeek; http://www.independent.co.uk/news/business/analysis-and-features/the-business-onralph-topping-chief-executive-william-hill-2226114.html (accessed: 26.04.2014)
	16.05.05	David Harding	49	2000	5	2000	5	no	no	business	Annual report 2004; Bloomberg BusinessWeek; http://www.williamhillplc.com/media/press-releases/2007pr2007-06-25.aspx (accessed: 03/05/2014); http://www.telegraph.co.uk/finance/migrationtemp/2807324/Business-profile-William-Hills-thoroughbred.html (accessed: 03/05/2014)
Wolsley PLC	02.10.06	Chip Hornsby	50	August 2006	0	1982	24	no	yes	business	Annual report 2006; Bloomberg BusinessWeek; http://www.wolsley.com/index.asp?pageid=69&newsid=27 (accessed: 03/05/2014)
	24.07.06	Charles A. Banks	64	May 2001	5	1982	24	no	yes	business	Annual report 2005; Bloomberg BusinessWeek; http://www.ferguson.com/corporate/about-us (accessed: 26/04/2014)
	31.10.05	Charles A. Banks	64	May 2001	4	1982	23	no	yes	business	Annual report 2005; Bloomberg BusinessWeek; http://www.ferguson.com/corporate/about-us (accessed: 26/04/2014)
	30.07.04	Charles A. Banks	62	May 2001	3	1982	22	no	yes	business	Annual report 2005; Bloomberg BusinessWeek; http://www.ferguson.com/corporate/about-us (accessed: 26/04/2014)
WPP PLC	29.09.08	Martin Sorrell	63	1986	22	1986	22	no	yes	business	Annual report 2007; Bloomberg BusinessWeek
	17.05.07	Martin Sorrell	62	1986	21	1986	21	no	yes	business	Annual report 2007; Bloomberg BusinessWeek
	13.09.04	Martin Sorrell	59	1986	18	1986	18	no	yes	business	Annual report 2007; Bloomberg BusinessWeek

Bloomberg Business Week; Available online: <http://www.businessweek.com>

Appendix E: Descriptive statistics for control variables

I. Absolute values

	DEALSIZE	ASSETS	MARKETCAP	OPCF	CAPEX	Q	ROA	SOLVENCY	OPINC
Mean	656.9350	11657.17	12598.49	1329.395	-6.669.124	1.649599	0.076890	0.386975	1180.593
Median	193.3516	3830.000	4840.900	390.0000	-9.850.000	1.400075	0.069500	0.353000	369.4000
Maximum	9635.228	147197.0	114873.6	18729.30	-2.500.000	7.291927	0.211000	1.202000	20189.40
Minimum	4.363600	219.4000	150.3000	-2.100.000	-33354.00	0.428297	-0.020000	0.000000	-5.070.000
Std. Dev.	1322.915	25582.72	21308.84	2751.738	2922.273	0.936818	0.039177	0.201411	2535.684
Skewness	4.254745	4.308116	2.882360	3.935141	-9.351.770	1.966326	0.642921	0.855603	4.029708
Kurtosis	23.74276	22.09942	10.95687	20.60440	100.5795	10.31998	3.546087	4.540158	25.33288
Jarque-Bera	3434.935	3000.020	659.7163	2541.018	66221.79	466.0731	13.33595	35.33541	3852.030
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.001271	0.000000	0.000000
Observations	164	164	164	164	161	162	164	160	164

II. Log-values

	LN_DEALSIZE	LN_ASSETS	LN_MARKETCAP	LN_OPCF	-LN_CAPEX	Q	ROA	SOLVENCY	LN_OPINC
Mean	5.377870	8.325393	8.570767	5.950980	-4.800.764	1.649599	0.076890	0.386975	5.889559
Median	5.263935	8.250620	8.484837	5.966147	-4.590.057	1.400075	0.069500	0.353000	5.911871
Maximum	9.173181	11.89953	11.65159	9.837844	-0.916291	7.291927	0.211000	1.202000	9.912913
Minimum	1.473297	5.390897	5.012633	-3.044.522	-1.041.493	0.428297	-0.020000	0.000000	-8.531.096
Std. Dev.	1.509884	1.354502	1.285974	1.817862	1.611727	0.936818	0.039177	0.201411	1.964909
Skewness	0.116374	0.393114	0.233538	-1.316.630	-0.422607	1.966326	0.642921	0.855603	-2.779.863
Kurtosis	2.627818	3.130290	3.193859	8.252287	3.936738	10.31998	3.546087	4.540158	20.75048
Jarque-Bera	1.316724	4.340057	1.747568	235.8907	10.67876	466.0731	13.33595	35.33541	2364.264
Probability	0.517699	0.114174	0.417369	0.000000	0.004799	0.000000	0.001271	0.000000	0.000000
Observations	164	164	164	164	161	162	164	160	164

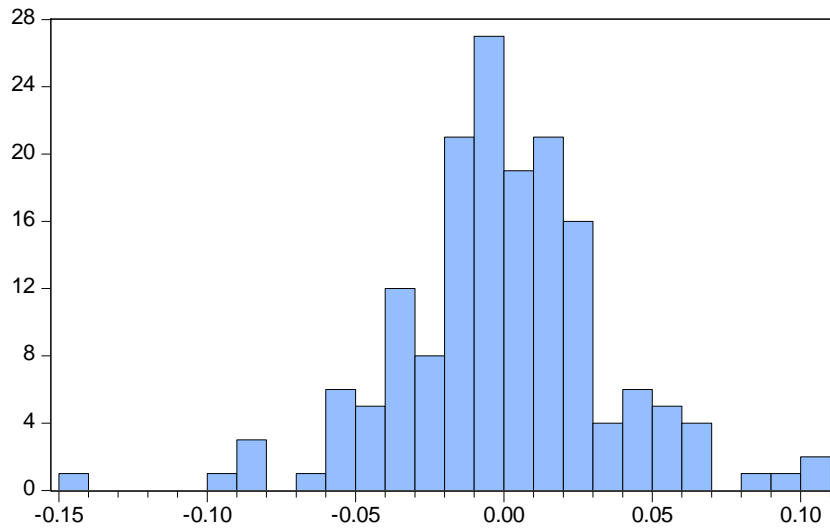
Appendix F: Correlation matrix

	AGE	CEOTENURE	FIRMTENURE	BOARD-OUTSIDE	EXPERIENCE	EDUCATIONBT	BUSINESS-ONLY	TECHNICAL-ONLY	THREORMORE
AGE	1.000000	0.299178	0.114636	0.116401	0.118231	-0.016224	-0.079464	-0.099271	0.306650
CEOTENURE	0.299178	1.000000	0.437774	0.134134	-0.206999	-0.108206	0.018678	-0.093464	0.412400
FIRMTENURE	0.114636	0.437774	1.000000	0.022523	-0.520969	0.017942	-0.157672	0.145966	0.142521
BOARDOUTSIDE	0.116401	0.134134	0.022523	1.000000	0.044120	-0.043609	0.097982	-0.007153	0.238645
EXPERIENCE	0.118231	-0.206999	-0.520969	0.044120	1.000000	0.034261	-0.001471	-0.151420	0.080773
EDUCATIONBT	-0.016224	-0.108206	0.017942	-0.043609	0.034261	1.000000	-0.454756	-0.155329	-0.026190
BUSINESSONLY	-0.079464	0.018678	-0.157672	0.097982	-0.001471	-0.454756	1.000000	-0.520480	0.045725
TECHNICALONLY	-0.099271	-0.093464	0.145966	-0.007153	-0.151420	-0.155329	-0.520480	1.000000	-0.080633
THREORMORE	0.306650	0.412400	0.142521	0.238645	0.080773	-0.026190	0.045725	-0.080633	1.000000
FIRSTDEAL	-0.242164	-0.312685	-0.117515	-0.249146	-0.045777	0.054386	-0.063850	0.075249	-0.589314
LN_DEALSIZE	-0.012225	0.010777	0.002723	0.056443	0.081218	0.071531	-0.001482	0.008238	-0.100945
LN_ASSETS	0.029262	-0.109407	0.008308	0.051788	0.107751	0.048439	-0.123734	0.078515	-0.102209
LN_MARKETCAP	-0.033753	-0.050484	0.076083	0.024011	0.063550	0.159977	-0.127086	0.065525	-0.078443
LN_OPCF	-0.031507	-0.077976	0.065271	0.062215	0.086822	0.125730	-0.154355	0.069135	-0.132975
LN_CAPEX	-0.146899	-0.154443	-0.021369	0.025432	-0.052461	0.158314	-0.160063	0.164914	-0.238220
Q	-0.072428	0.202466	0.131727	-0.034576	-0.096929	0.222520	0.019117	-0.039071	0.049185
ROA	-0.099192	-0.041107	0.156480	-0.257630	-0.164965	0.334995	-0.026590	-0.173838	-0.144821
SOLVENCY	0.095895	-0.025664	-0.121401	-0.006793	0.018599	-0.080386	0.274789	-0.239345	-0.034522
LN_OPINC	0.039520	-0.055554	0.104605	-0.045680	-0.038181	0.148413	-0.020537	-0.131191	-0.075689

	FIRSTDEAL	LN_DEALSIZE	LN_ASSETS	LN_MARKETCAP	LN_OPCF	LN_CAPEX	Q	ROA	SOLVENCY	LN_OPINC
AGE	-0.242164	-0.012225	0.029262	-0.033753	-0.031507	-0.146899	-0.072428	-0.099192	0.095895	0.039520
CEOTENURE	-0.312685	0.010777	-0.109407	-0.050484	-0.077976	-0.154443	0.202466	-0.041107	-0.025664	-0.055554
FIRMTENURE	-0.117515	0.002723	0.008308	0.076083	0.065271	-0.021369	0.131727	0.156480	-0.121401	0.104605
BOARDOUTSIDE	-0.249146	0.056443	0.051788	0.024011	0.062215	0.025432	-0.034576	-0.257630	-0.006793	-0.045680
EXPERIENCE	-0.045777	0.081218	0.107751	0.063550	0.086822	-0.052461	-0.096929	-0.164965	0.018599	-0.038181
EDUCATIONBT	0.054386	0.071531	0.048439	0.159977	0.125730	0.158314	0.222520	0.334995	-0.080386	0.148413
BUSINESSONLY	-0.063850	-0.001482	-0.123734	-0.127086	-0.154355	-0.160063	0.019117	-0.026590	0.274789	-0.020537
TECHNICALONLY	0.075249	0.008238	0.078515	0.065525	0.069135	0.164914	-0.039071	-0.173838	-0.239345	-0.131191
THREORMORE	-0.589314	-0.100945	-0.102209	-0.078443	-0.132975	-0.238220	0.049185	-0.144821	-0.034522	-0.075689
FIRSTDEAL	1.000000	0.106322	0.050991	0.032177	0.056983	0.166599	-0.038099	0.065728	-0.001569	-0.010323
LN_DEALSIZE	0.106322	1.000000	0.613483	0.651703	0.623341	0.546069	0.071420	0.152399	-0.145332	0.398046
LN_ASSETS	0.050991	0.613483	1.000000	0.913011	0.880582	0.817172	-0.238702	-0.100174	-0.064969	0.548130
LN_MARKETCAP	0.032177	0.651703	0.913011	1.000000	0.889914	0.808917	0.153016	0.200406	-0.090707	0.595079
LN_OPCF	0.056983	0.623341	0.880582	0.889914	1.000000	0.789309	-0.021521	0.129834	-0.036139	0.555168
LN_CAPEX	0.166599	0.546069	0.817172	0.808917	0.789309	1.000000	-0.036524	0.051848	0.006182	0.485382
Q	-0.038099	0.071420	-0.238702	0.153016	-0.021521	-0.036524	1.000000	0.702888	0.087201	0.079464
ROA	0.065728	0.152399	-0.100174	0.200406	0.129834	0.051848	0.702888	1.000000	0.131315	0.349181
SOLVENCY	-0.001569	-0.145332	-0.064969	-0.090707	-0.036139	0.006182	0.087201	0.131315	1.000000	0.077049
LN_OPINC	-0.010323	0.398046	0.548130	0.595079	0.555168	0.485382	0.079464	0.349181	0.077049	1.000000

Appendix G: Test for normality distribution of the residuals

I. Regression 4

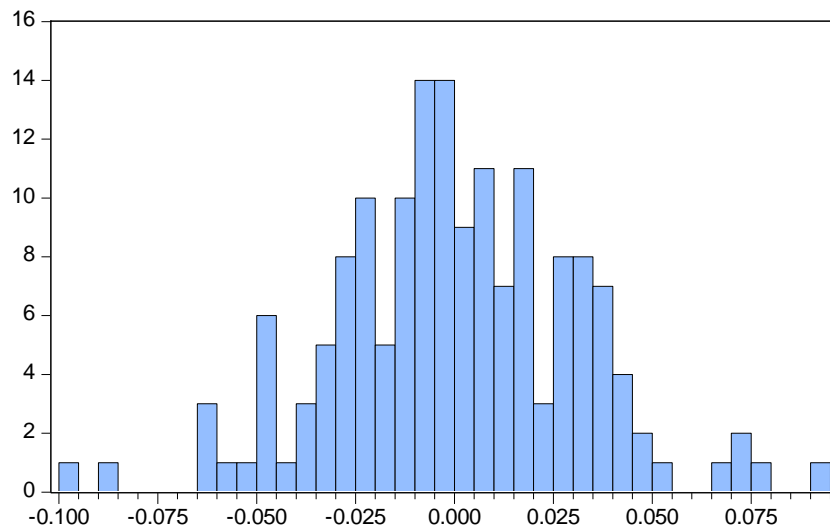


Series: Standardized Residuals
Sample 2/16/2004 11/19/2013
Observations 164

Mean	2.46e-17
Median	-0.001864
Maximum	0.107900
Minimum	-0.147508
Std. Dev.	0.036308
Skewness	-0.190502
Kurtosis	4.879888

Jarque-Bera	25.14080
Probability	0.000003

II. Regression 5, excluding outliers



Series: Standardized Residuals
Sample 2/16/2004 11/19/2013
Observations 159

Mean	4.04e-18
Median	-0.002092
Maximum	0.093276
Minimum	-0.096899
Std. Dev.	0.030739
Skewness	-0.011408
Kurtosis	3.621354

Jarque-Bera	2.561238
Probability	0.277865

The five excluded *CAR3Day* observations belong to the acquisitions:

- ARM Holdings PLC- 23.08.04
- Babcock International Group PLC- 10.05.07
- GKN PLC- 05.07.12
- Shire PLC- 21.04.05
- Weir Group PLC- 21.06.07