Board Composition, ‘Grey Directors’ and the Incidences of Corporate Failure in the UK

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Abstract

This study contributes to the debate by empirically examining the characteristics of board prior to failure and their relationships with the incidences of corporate failure. Specifically, this research splits board of directors into inside directors, grey directors and independent outside directors in the analyses. It has been found that the likelihood of corporate failure is negatively related to the percentage of non-executive directors. After categorizing non-executive directors as either independent outside directors or grey directors, there is no significant association between corporate failure and the percentage of independent outside directors. However, the results show that greater grey directors on the board, the lower probability of corporate failure. Additionally, corporate failure and leadership duality is not related. The findings might suggest that the role of grey directors is distinct from both inside directors and independent outside directors, and overemphasizing on the independence of board is not favorable to firm survival.

Keywords: corporate governance, board composition, audit committee, grey directors, corporate failure

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**The authors would like to thank for helpful comments from an anonymous reviewer, A. Rashad Abdel-khalik (the editor), Nikos Vafeas, and conference participants at the 2010 British Accounting Association Meetings in Cardiff and the 2010 Finance & Corporate Governance Meetings in Melbourne.
1. Introduction

This study investigates the relationships between board structure and the incidences of corporate failure in the UK. Specifically, this paper split board members into inside, grey and outside directors in the discussions of board and audit committee compositions. From an agency perspective, the need to establish an appropriate corporate governance mechanism arises because the separation of ownership from control produces agency problems and such problems cannot be solved through a contract (Hart, 1995). The debate on the role and quality of corporate governance was initiated by a series of financial scandals in the 1980s in the United Kingdom (Demirag et al., 2000). In early 1990s, the Cadbury committee was set up in response to some unexpected corporate failure of major companies and criticisms of board ineffectiveness (Cadbury, 1992). Overall, corporate governance is a well-established dimension to study, but its association to corporate failure is not yet clear. Especially, there is no empirical research on the relationship between corporate failure and corporate governance in the context of UK market.

Studying situations where companies are experiencing survival difficulties might be beneficial to gain better understanding of the effectiveness of corporate governance mechanisms (Frankforter et al., 2000, Kosnik, 1987, Mangena and Chamisa, 2008). Despite a large number of literatures on corporate governance mechanisms and their effects on decision making and firm performance (e.g. McConnell and Servaes, 1990, Short and Keasey, 1999, Agrawal and Knoeber, 1996, Hermalin and Weisbach, 1991), their findings remain inconclusive. Some studies discuss the impact of corporate governance on corporate failure and those studies have been primarily US based (Changanti et al., 1985, Daily and Dalton, 1994a, Daily and Dalton, 1994b, Daily, 1996, Hambrick and D'Aveni, 1992), but they also provide mixed results¹.

A study to empirically link corporate failure to corporate board characteristics is desirable in the UK. Vafeas and Theodorou (1998) indicated that the importance and value of various governance mechanism should be separately investigated in each country since the differences in regulatory and economic environment, development of capital market and corporate governance practices may vary across national boundaries. In spite of the fact that commentators often refer to ‘Anglo-Saxon’ systems of corporate governance (see, for example, Sykes, 1994) and the UK and the USA have market-based systems of corporate governance,

¹For example, Changanti et al (1985) documented that the percentage of outside directors was not associated with corporate failure. However, Hambrick and D'Aveni (1992) found a significantly negative relationship between the percentage of outside directors and the likelihood of corporate failure.
these systems display differences in a number of ways. For example, the operation of corporate board and board culture are different. There is an significant difference on the operation of corporate boards between the UK and US (Short and Keasey, 1999). In contrast to the boards of US companies dominated by outside directors, the boards of UK companies are typically dominated by executive directors (Dahya and McConnell, 2007, Short and Keasey, 1999). The leadership duality of CEO and chairman is more prevalent in the USA than the UK counterpart. The form of shareholder activism is different between the two countries. Financial institutions in the USA, for example, are more frequently to present shareholder resolutions to companies than those in the UK (Solomon and Solomon, 2004, Monks and Minow, 2001). Another difference is on the level of executive remuneration. Cheffins (2003) documented that the remuneration of US executives traditionally were far higher than those of executives in the rest of the world, such as the UK.

In addition, there was also difference in the governance regulatory environment between the UK and USA. The UK governance codes have been brought into practice from the publication of the Cadbury Report in 1992. However, prior to the Sarbanes-Oxley Act (2002), the US securities laws did not directly address board structure. The sample periods used in the major existing US failure-governance studies were before early 1990s when the USA did not have a definitive corporate governance code in the same way that the UK do. Therefore, the results generated by the existing US studies may not be extended to explain the relationship between corporate failure and board structure in the UK.

Particularly, in a departure from extant literature, this research addresses the relationship between corporate failure and the percentage of ‘grey directors’ on board, a setting in which the evidence is almost non-existent internationally. An important issue in the current debate on board structure is the independence of the board. In the UK, an overall trend of the board structure is to make boards relatively independent. Young (2000) and Dahya et al. (2002) documented that UK companies were more willing to separate the roles of chairman and CEO and increase the weight of non-executive directors on their board over the period of their studies. Hillier and McColgan (2006) further highlighted that, after the Cadbury Report (1992), there were significant growth in the fraction of non-executive and independent outside directors serving on company boards, and a corresponding decrease in the fraction of inside directors (executive directors). Interestingly, the fraction of non-executive directors who are considered as non-independent remained relatively consistent at around 15% of total board members over their study period. It reflects that non-independent non-executive
directors (also known as ‘grey director’) still commonly serve in the board in the UK.

However, prior studies primarily focus on the effectiveness and governance roles of independent outside directors or inside directors. The role of grey directors to be more like inside directors or outside directors remains ambiguous in the corporate governance literature. Some prior studies classified inside and grey directors as affiliated directors because they both have certain types of economic or personal ties with companies and top management teams (Carcello and Neal, 2000, Carcello and Neal, 2003, Beasley, 1996, Hillier and McColgan, 2006, Vicknair et al., 1993). From that point of view, grey director is considered to be more like inside director. On the other hand, the responsibility of grey directors is more like that of outside directors since all non-executive directors are expected to scrutinize management performance according to the governance codes (e.g. Combine Code, 2003, Cadbury, 1992). Therefore, the corporate governance role and the effectiveness of inside directors, grey directors and outside directors need to be clarified.

This research employed a matched pair design of 79 failed firms and 79 non-failed control firms and performed conditional logistic regression method in the analyses. The results show a negative association between the incidences of corporate failure and the percentage of non-executive directors on board. After categorizing non-executive directors into independent outside directors and grey directors, it is found that the likelihood of corporate failure is not significantly related to the percentage of independent outside directors on board. However, the non-failed firms are more likely to have greater grey directors on board, suggesting that grey directors may have distinct roles from both inside and independent outside directors. The findings can also be extended to reinforce a view by the Hampel Report (1998) that non-executive directors who are not in the sense of independence may nonetheless contribute to the board. In addition, the probability of corporate failure is not related to the leadership duality and board size. Overall, the results do not completely support the notion that independent boards are more effective in protecting shareholders. It implies that over-emphasizing on the independence of board is unfavorable to firm survival.

The remainder of this paper is structured as follows. Section 2 review previous literatures and develops the hypotheses, while Section 3 describes the sample selection procedure and research design. The results are presented and discussed in Section 4. Finally, Section 5 concludes.
2. Literature review and hypotheses development

2.1 Board of directors

The board is the supreme decision-making unit in the company. The board of directors, therefore, has responsibility to safeguard and maximize shareholders’ wealth, oversee firm performance, and assess managerial efficiency. Fama and Jensen (1983) pointed out four actions of initiation, ratification, implementation and monitoring, undertaken by board in the decision-making processes, but they argued that the board (assumed to be dominated by independent outsiders) would normally delegate the decision management functions to managers/executives. Harrison (1987) confirmed this phenomenon and found that the board do not actively participate in the initiation and formulation of corporate policies. Therefore, the main role of the board is seen as the ratification and monitoring of decisions, overseeing the actions of managers/executives. However, Chaganti et al. (1985) indicated that corporate board plays both control function and services function. Whenever the board fails in one function or in both, firm performance would become deficient.

As parts of members of unitary board, executive directors have full-time executive responsibilities and involve in day-to-day activities. Non-executive directors are normally part-time and do not play any administrative or executive role in the firms. Non-executive directors are generally expected to act on behalf of external shareholders to oversee executive directors and management (Fama, 1980, Connors, 1989, Baysinger and Hoskisson, 1990, Cadbury, 1992). Consequently, non-executive directors are expected to be independent in performing their monitoring function. However, in a unitary board, all directors are legally responsible for all aspects of the company’s activity in the UK firms. Therefore, the non-executives also have to work closely with the executives in initiating and implementing corporate policy and provide administrative and strategic advice. McNulty and Pettigrew (1999) found that non-executive directors were able to influence corporate strategy. However, Ezzamell and Watson (1997) argued that there is a potential conflict in the governance role of non-executives.

From an agency perspective, non-executive directors may be perceived as playing monitoring role on executives. According to previous studies and the corporate governance codes, the appointment of non-executive directors may improve the effectiveness of the monitoring function undertaken by board. Non-executive directors possess professional knowledge and skills useful to senior manager (Baysinger and Butler, 1985). An independent board structure is capable
to enhance more objective assessment of firm and management performance (Weidenbaum, 1986).

The quality of board oversight also depends on the board members’ incentive to monitor managerial activities. It is suggested that non-executive directors are also concerned about their personal reputation in the labour market (Fama and Jensen, 1983, Carter et al., 2003). Therefore, Fama (1980) indicated that the presence of non-executive directors is an important mechanism to oversee executive activities and ensure that those activities are based on the best interests of shareholders. The Cadbury report (1992) suggested that the presence of non-executives should be effective in improving board independence and firm performance and thus, reduce financial fraud. The Code of Best Practice recommended that the board of directors should include non-executive directors of sufficient number and caliber in order to give non-executive directors significant weight in the board’s decisions.

An implicit assumption of the agency model is that inside directors are opportunistic agents who have incentive to maximize personal wealth at the expense of shareholders. Nevertheless, stewardship theory proposes that executives may have intrinsic motivation to pursue, for example, achievement and recognition (Donaldson, 1990). Managers therefore are motivated to maximize firm value and work in the best interests of the shareholders (Davis et al., 1997). According to this view, executive inside directors are in a better position and have greater commitment to the firm, compared to outside directors, to examine managerial decisions and activities because they are more knowledgeable about the firm and its industry (Baysinger and Hoskisson, 1990, Wagner III et al., 1999, Boyd, 1995). Conversely, Mace (1986), Patton and Baker (1987) and Lorsch and Maclver (1989) argue that if outside directors do not have incentives, firm-specific knowledge and do not devote their time to the company, they could not provide effective monitoring services.

Similarly, from the perspective of strategy implementation and control, it is also argued that outside directors are usually part-time and have positions on a number of other boards. Therefore, outside directors may not be able to understand each business thoroughly (Baysinger and Hoskisson, 1990, Patton and Baker, 1987). Inside directors, who are normally well-informed relative to outsiders, may be more likely to accurately evaluate the performance of top management (Williamson, 1975) and ratify corporate decision and strategies (Rosenstein and Wyatt, 1990). Ang et al. (1999) found evidence to suggest that agency costs are higher when outside directors dominate the firm.
2.2 Classification of directors

Two kinds of directors classification schemes are traditionally used in corporate governance literature: affiliated directors – independent directors or executive directors – non-executive directors. Prior research generally fails to examine and recognize the governance role of the non-executive directors who have affiliations with the firms or executives. This paper therefore follows the criteria used to classify the independence of non-executives by the Combined Code (2003), and places directors into three categories: executive directors (inside directors), grey directors (affiliated non-executive directors) and independent non-executive directors (independent outside directors).

Directors classified as inside directors normally have executive responsibility. They work closely with the top management of the company. Inside directors provide a source of expertise in formulating and implementing corporate strategies and the process of corporate decision making (Baysinger and Hoskisson, 1990, Patton and Baker, 1987, Rosenstein and Wyatt, 1990, Baysinger and Butler, 1985, Adams and Ferreira, 2007b). Independent outside directors have no affiliations with the company. Their primary activity is to exercise independent judgment on scrutinizing management performance. Raheja (2005) indicates that inside directors are an important source of firm specific knowledge for the boards, but they may not behave to pursue better shareholder benefits due to self-interests and lack of independence from top management. Compared to inside directors, outside directors are more independent to monitor managerial activities, but are less informative about the firm’s operation.

The role of grey director remains unclear. According to definitions stated in the Combined Code (2003), grey directors have personal or commercial ties with the firm or executives. Such ties inferred where the non-executive is related to any of the firm’s directors, advisors or senior employee, has served on the board for more than nine years, was formerly an employee of the company or group, has received additional remuneration apart from director’s fee, has any material business relationships with the company, represents a significant shareholder, or interlocking directors\(^2\). Grey directors may be functionally different from both independent outside directors and inside directors. From agency perspective, they cannot be expected to effectively play the primary monitoring and control roles since they are close to the executives or companies (Ezzamel and Watson, 1997). Their monitoring duty as non-executive directors may be constrained on some issues where the

However, grey element of the board is made up of directors who have interests in the firms. Compared to independent outsiders, grey directors may have higher incentive and better firm-specific knowledge to devote their time and efforts to the companies. They might be therefore more capable to support board to carry out its managerial functions. Additionally, from resource dependency perspective, some grey directors who represent business partners on board also serve to link the firms to external resources and business community (Pfeffer, 1972, Burt, 1980). Accountants, lawyers, consultants and finance providers who sit on the board may also provide advice and monitoring to management. Westphal (1999) also suggest that social ties between CEO and outside directors may facilitate the involvement of board in the strategy-making process. Consequently, the role of grey directors is conceptually distinct from the inside and independent outside directors.

2.3 Hypotheses development

2.3.1 Board composition

In the UK, the corporate governance regulations include recommendations aimed at strengthening the independence of non-executive directors, and highlight the proportion or number of independent non-executive directors on board. For example, the Combined Code (2003) requires companies to identify independent non-executive directors and at least half of board should comprise independent non-executive directors. Therefore, the presence of non-executive directors is generally believed to provide 'better' governance. On the other hand, Estes (1980) indicated that it is hard for outside directors to understand the complexities of a company and, hence, to carry out the effective monitoring activities. Additionally, a large number of outside directors on board may lead to the conflict between board and top management team and then affect board efficiency (Sethi et al., 1979).

The empirical results of previous studies regarding the relationship between board independence are still inconclusive. Rosenstein and Wyatt (1990) reported significant positive movements in share prices in response to the appointment of outside directors. Weir and Laing (2002) also indicated that the proportion of independent non-executive directors on the board has positive effect on the Tobin’s Q in the UK. Moreover, Hambrick and D’Aveni (1992) and Gales and Kesner (1994) found that bankrupt firms experience a decline in the number of outside directors on the board in the years prior to their failure.

In contrast, Agrawal and Knoeber (1996) and Yermack (1996) suggested that a
higher proportion of outside directors on board is unfavorable to firm performance. In support of this finding, Wier and Laing (2000) reported a negative relationship between the number of non-executive directors and firm performance in the UK. However, a number of research did not document any significant relationship between board structure and firm performance (e.g. Hermalin and Weisbach, 1991, Bhagat and Black, 1999). Accordingly, the research hypothesizes:

**H1a.** There is a negative or positive relationship between the probability of corporate failure and the proportion of non-executive directors.

**H1b.** There is a negative or positive relationship between the probability of corporate failure and the proportion of independent outside directors.

Non-executive directors can be categorized into independent outside directors and grey directors; however, the difference in their governance roles and influences has not been broadly discussed. Grey directors are those who have some affiliation with top management and company. Although, based on the governance codes (e.g. Combine Code, 2003), the responsibilities of grey directors is not distinguishable from those of independent outside directors, grey directors are considered to be more like executive directors in nature in many corporate governance research because they have commercial or personal ties with the firms. Therefore, prior research primarily addressed the monitoring role of independent outside directors (e.g. Brickley et al., 1994, Denis and Sarin, 1999). They generally believed that grey directors are unable to oversee management effectively.

Unfortunately, only very limited governance research empirically discuss the distinctions between executive directors, grey directors and independent outside directors. Vance (1964) studied 113 companies in the Furtune-200 groups and concluded that ‘Inside boards are superior in performance to outside boards; outside boards with relatively strong management representation are superior to those lacking such management representation;...’ Adams and Ferreira (2007b) also mentioned that insiders play an important monitoring role since they could access better information to the business and understand better the actions taken by the CEO. Fama and Jensen (1983) suggested that inside directors are also important to effective governance since they provide useful information to outsiders for evaluating managerial performance. To extend from those points, grey directors may perform better than independent outside directors on monitoring managerial activities.

Moreover, the Hampel Report (1998) states that the effectiveness of a board is related to the form, timing and quality of the information which it receives. It is
argued that it is costly for outside directors to acquire information and transform their knowledge to the specific firm (Linck et al., 2008). It is also costly for firms to transfer inside information to outside directors (Maug, 1997). Therefore, the social ties between grey directors and firms may facilitate non-executive directors to play effective service function. According to the above arguments and counter arguments relating to the independence and composition of board, this research hypothesizes:

**H2.** There is a negative or positive relationship between the probability of corporate failure and the proportion of grey directors.

### 2.3.2 Leadership duality

Another issue in relation to the board control mechanism is the independence of board chairperson. The Cadbury report (1992) recommended that one person should not take the positions of board chairperson and chief executive. It has been argued that the incidence of leadership duality would diminish the control power (Fama and Jensen, 1983, Morck et al., 1987) and independence (Rechner, 1989) of the board. On the contrary, Weir et al. (2002) mentioned that having the same person acting the combined role of both positions would help to understand the business environment more. Nevertheless, the empirical results with regard to the relationship between the leadership duality and firm performance remain mixed. Rechner and Dalton (1991) found that leadership duality impaired the profitability of firms. In contrast, Boyd (1995) concluded that firm performance is positively associated with the incidence of leadership duality. However, Baliga et al. (1996) and Dalton et al. (1998), Vafeas and Theodorou (1998), Weir and Laing (2000) and Weir et al. (2002) did not find that the leadership duality has any significant relationship with firm performance. Accordingly,

**H3.** There is a negative or positive relationship between the probability of corporate failure and leadership duality.

### 2.3.3 Board size

The relationship between board size and firm performance is another inconclusive issue in the previous research. A larger board is supposed to be more diversified in terms of the backgrounds of board members (Bacon, 1973). Meanwhile, the CEOs are less likely to dominate corporate decision making in the firms with a large board because the control power in such firms are more diluted (Zahra and Pearce, 1989). In this circumstance, firm performance therefore is considered to be positively related to board size (Zahra and Stanton, 1988).
Changanti et al. (1985) empirically suggested that firms with small board size are more likely to be bankrupt. Additionally, Gales and Kesner (1994) also found that there is a decline on the board size of bankrupt firms over the period preceding their actual failure. On the other hand, some researches however suggested that large board size would reduce managerial efficiency and increase managerial costs (Jensen, 1993, Lipton and Lorch, 1992). From this view, firms with smaller board size should have better performance (Yermack, 1996, Eisenberg et al., 1998). Thus,

**H4.** There is a negative or positive relationship between the probability of corporate failure and board size.

### 3. Sample and research design

#### 3.1 Sample selection and data

This research aims to discuss the relationship between corporate governance mechanisms and firm failure by examining such structures across four years prior to the corporate failure event. Failed companies are identified by investigating the outcomes of all quoted companies cancelled from the Official List on The London Stock Exchange (LSE) between the years of 1997 and 2005. Additionally, companies were included in the sample data if they were transferred from the Official List to the AIM (Alternative Investment Market) List and subsequently cancelled from the AIM List between 1997 and 2005, but they did not file any annual account during their AIM listing periods. A company is considered to be a failed company in this research if the reason for the cancellation of its listing was because it had entered receivership, administration or liquidation, consistent with the

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3 The lists of companies removed from the Official List and AIM on The London Stock Exchange are obtained from the Citytext or Hemscott Company Guru electronic resources.

4 Bankruptcy codes in the UK differ between England and Wales, Northern Ireland and Scotland. Firms in the UK can be voluntarily and compulsorily liquidated when they are unable to meet the required payments to their creditors. The process of liquidation involves winding up the firm’s operation, selling off the assets of firms and distributing the proceeds to the creditors. Alternatively, the company can determine to be in administration and appoint an administrator, which allow the firm to restructure its debt and equity claims, rescue the company as a going concern or realize assets to make distribution to creditors by selling the company or its assets. In addition to liquidation and administration, an additional bankruptcy act in Scotland that was introduced in 1986 allows firms to go into receivership. This is also a case in England and Wales for firms that have outstanding securities from before 2003. When a firm goes into receivership, an administrator (typically an insolvency practitioner) is appointed to take control and possession of the assets of the firm and then run the firm’s main day-to-day business. The receivership ends when the company’s floating assets have been realized and payments from those have been made to creditors or winding up take place (Hillier et al., 2008).

Companies were excluded from the sample for the two additional reasons. First, non-UK companies were excluded. Second, companies in financial or mining sectors were excluded because they have a number of significant differences in the accounting systems and industrial characteristics such as the income measuring accounting rules.

Based on the stated criteria, an initial sample of 101 failed companies removed from the Official List between the years of 1997 and 2005 was obtained. Table 1 presents the number of the failed companies classified by the nature of failure for each year from 1997 to 2005. It shows that the number of the failed companies increased over the period between 1997 and 2002, and then decreased after 2002. Table 2 documents the distributions of the age and listing period on LSE of the failed companies. The average age and listing period of the failed companies was 37 and 15 years, respectively. 50% of the failed companies were younger than 20 years old. Meanwhile, 53% of the failed companies listed on the LSE for less than 10 years.

However, due to the fact that the complete data regarding corporate governance and financial information across four years before failure is not available to all the 101 failed companies, the final sample is made up of 79 failed companies. Therefore, the failed company sample comprises of 79 with full corporate governance and financial information across the four years prior to failure. The distribution of the industrial classifications for the 101 failed companies and 79 failed sample companies have been shown in Table 3.

[Insert Table 1]

[Insert Table 2]

[Insert Table 3]

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5 Company age is the period between the failure date and incorporation date.
Furthermore, each failed sample company used in this analysis was matched with a live (non-failed) company. A matching procedure was employed in this study because corporate governance data needed to be collected manually and so the matching approach keeps the data set in a manageable size. Moreover, the matching approach develops a systematic method to determine the sample of non-failed companies and is used in the majority of research in this area (Beaver, 1966, Altman, 1968, Keasey et al., 1990, Hambrick and D’Aveni, 1992, Daily and Dalton, 1994a, Daily and Dalton, 1994b). Peasnell et al. (2001) indicated that the matching-pairs approach “provides a parsimonious means of controlling for certain potentially important confounding (non-accounting) firm specific characteristics” of target firms.

The matching process is based on three criteria in this study. First, failed and non-failed companies are matched in terms of the fiscal years of accounts used to form corporate governance information and financial ratios. Second, the companies have to be matched in terms of the FTSE industrial sector. So the firms in each pair were under the influence of similar economic and industrial conditions (Changanti et al., 1985). Third, non-failed companies were sampled in terms of failed company size (as measured by sales) stated in the last complete filed account prior to the failure. Table 5 shows that there is no significant difference on total sales between the failed and non-failed sample firms.

Corporate governance data used in this research are collected manually from the annual reports of the failed and non-failed sample companies, ICC Plum electronic resource or Lexis-Nexis electronic resource over four fiscal years prior to the failure year of failed companies and over the equivalent period for the matched companies. Financial information is also collected manually from the companies’ financial annual accounts for the majority parts of the failed companies. The financial information for the non-failed companies and part of the failed companies is obtained from the electronic resources of the Perfect Analysis or Datastream.

Table 4 shows that, on average, the delisting date of the failed companies is only half a month after the failure date. Additionally, the average length of time between the failure date and the date of the last annual report (account issue date) is 14 months.

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6 The matching criteria of time period, industry classification and company size employed in this study were commonly used in prior bankruptcy studies (e.g. Blum, 1974, Beaver, 1966, Daily, 1996).
7 Each failed sample company is matched with a non-failed company at the 3-digit level of sub-sector code of FTSE industrial classification.
8 Within the industry group of each failed sample firm, the firm whose total sales is closest to the total sales of the failed firms was selected as a non-failed sample firm.
months⁹ (10 months). Therefore, the corporate governance and financial information in the most recent four annual reports and accounts across four fiscal years prior to the corporate failure will be basically used in the analysis for the failed companies; meanwhile, the information for the non-failed companies will be matched by the same fiscal year. However, if a failed sample company has been in the material distress situation, such as no trading activities or trading suspension on the LSE, before the fiscal year-end of its final filed annual account, the year in which the significant distress occurs is considered as the actual failure year and the annual report from the previous fiscal year is substituted in order to meet the economical reality.

3.2 Model

This research will employ conditional logistic analysis to examine the hypotheses regarding the relationships between corporate governance characteristics and corporate failure. The conditional logistic regression is used for two main reasons (Hosmer and Lemeshow, 2000). First, the dependent variable employed in the empirical analysis is dichotomous. Second, a conditional logistic model is an appropriate method because it takes into consideration the matched character of the sample. The general models are developed as follows:

\[
\text{STATUS} = \beta_0 + \beta_1 \text{BOARDCOM} + \beta_2 \text{DUALITY} + \beta_3 \text{BSIZE} + \beta_4 \text{CONTROL} + \epsilon
\]

The control variables are drawn from previous literature. Four groups of control variables are applied in the analysis. First, the percentage of shares held by directors (DOWN) is used to control managerial incentive (e.g. Short and Keasey, 1999, Jensen, 1993). Second, CEO tenure (CEOTEN) and director’s age (DAGE) are controlled. They are measured of CEO and director’s experience and attitude on corporate strategy (e.g. He, 2008, Simsek, 2007, Hambrick and D’Aveni, 1992, Hambrick and Mason, 1984). Third, the shareholdings concentration (BLOWN) is also controlled. It is argued that block shareholders have higher incentive and more capable to involve in the monitoring activities (e.g. Shleifer and Vishny, 1986, Fama and Jensen, 1983, Brickley et al., 1988). Forth, this paper controls ex ant failure

⁹ This is similar to the findings of Citron and Taffler (1992) and Lennox (1999).
risk by employing cash flow ratio (CFO), leverage ratio (LEV), liquidity ratio (LIQ) and company’s age (COMAGE) which are commonly used in previous bankruptcy research (e.g. Altman, 1968, Blum, 1974, Daily and Dalton, 1994a, Howton, 2006).

The variables are defined as follows:

**STATUS**  
Firm survival status, measure as a dummy variable coded on if firm was failed, zero if it’s is a non-failed firm.

**BOARDCOM**  
The composition of main board members.

**PNED**  
The percentage of board members classified as non-executive directors.

**POUT**  
The percentage of board members classified as outside directors. Outside directors are non-executive directors without economic or personal ties to company or management.

**PGREY**  
The percentage of board members classified as grey directors. Grey directors are non-executive directors who fail to be classified as independent outsiders.

**DUALITY**  
Leadership duality, measured as a dummy variable with a value of one if the position of chair and CEO are held by one person, zero if otherwise.

**BSIZE**  
Number of members seated on main board.

**CONTROL**  
Control variables

**DOWN**  
Total percentage shareholdings of directors.

**CEOTEN**  
CEO tenure years, number of years which the incumbent CEO in the board.

**DAGE**  
Average board of directors’ age.

**BLOWN**  
Total percentage shareholdings held by external blockholders.

**CFO**  
Cash flow ratio, measured as total operating cash flow scaled by total assets.

**LEV**  
Leverage ratio, measured as percentage of total debt to total assets.

**LIQ**  
Liquidity ratio, measured as percentage of current liabilities to current assets.

**COMAGE**  
Company’s age, measured from the year of incorporation.

4. Empirical results

4.1 Descriptive statistics and univariate analysis

Table 5 presents the descriptive statistics, by survival status, for each of the independent variables. Panel A provides the statistics on the continuous variables and the results of the Wilcoxon rank sum test, while Panel B shows the statistics for categorical variables and the results of the chi-square test.

Panel A documents that, for board composition the non-failed firms have significantly higher proportion of non-executive members on their boards than the failed firms (PNED), a finding consistent with Hambrick and A’Dveni (1992).

10 The definition of grey directors has been stated in Section 2.2.
Interestingly, after splitting non-executive directors into independent outside directors and grey directors, the percentage of grey directors (PGREY) for the non-failed firms is significantly greater than that for the failed firms at the 5% level. However, there is no significant difference in the percentage of independent outside directors (POUT) between the failed and non-failed firms. Additionally, the failed firms employ smaller number of directors on board (BSIZE) than the non-failed counterparts, which is not consistent Changanti et al. (1985). Panel B shows that slightly more non-failed firms combine the role of CEO and chairman (DUALITY).

As for control variables, the failed firms’ CEOs had significantly shorter tenures (CEOTEN), consistent with the suggestion by Hambrick and D’Aveni (1992) that high top management turnover occurs in troubled firms. The average age of directors (DAGE) in the failed firms is significantly younger than that in the non-failed counterparts. There is no significant difference on the managerial shareholdings (DOWN) and external block shareholdings (BLOWN) between the failed and non-failed firms. Additionally, compared to the non-failed firms, the failed firms have significantly smaller cash flow (CFO), return on assets (ROA), liquidity (LIQ) and greater leverage level (LEV). The difference on the company’s age is not significant between the failed and non-failed firms.

\[\text{Insert Table 5}\]

4.2 Results of conditional logistic regression analysis

4.2.1 Correlation matrix and multicollinearity

Due to the fact that multicollinearity in regression analysis is considered harmful, the Spearman’s rho correlations between the independent variables is provided in Table 6 and the variance inflation factors (VIFs) are computed and examined for each independent variable in order to examine whether multicollinearity is problematic. All independent variables included in each regression analysis in this research are below 0.47. Multicollinearity in regression analysis is regarded harmful only when correlations exceed 0.7 (Tabachnick and Fidell, 2007). In addition, in all cases shown in Table 7, the VIFs are below 1.5, which are far lower than the critical
value of 10 (Tabachnick and Fidell, 2007), also suggesting multicollinearity is not a major problem in the regression analyses.

[Insert Table 6]

4.2.2 Regression analyses results and discussion

Table 7 presents the results of the conditional logistic regression model used to examine the relationship between the likelihood of corporate failure and the board composition. The overall models are highly significant (p < 0.001). In Equation (1), the incidence of corporate failure is found significantly related to the percentage of non-executive directors on board (PNED) negatively, which is in line with Hambrick and D’Sveni (1992). This means that there is a positive relationship between the likelihood of corporate failure and the percentage of executive directors. After splitting non-executive directors into independent outside directors and grey directors, the percentage of independent outside directors on board (POUT) is positively related to corporate failure (Equation (2)), but the result is not significant. This result is not consistent with Daily and Dalton (1994a) who find a negative relationship between corporate bankruptcy and percentage of independent outsiders. However, the incidence of corporate failure is associated to the percentage of grey directors on board (PGREY) negatively at the 1% significance level (Equation (3)). In contrast to the finding by Daily and Dalton (1994a), the likelihood of corporate failure is not significantly related to the presence of leadership duality (DUALITY). There is no significant relationship between the likelihood of corporate failure and the board size (BSIZE).

The differences on the findings regarding independent outside directors and leadership duality between this paper and the US study by Daily and Dalton (1994a) may be caused by the difference in national regulatory environment and time period studied. The UK governance codes were implemented from the Cadbury Report in 1992 and generally require UK companies to have more independent non-executive directors and separate the position held by CEO and chairman, but the US securities laws did not address the board structure until the US brought in the Sarbanes-Oxley Act in 2002. The sample in this study was selected for the period after the publication of the Cadbury Report (1992), while Daily and Dalton (1994a) used a sample in early 1990s.

11 Percentage of executive directors = 1 – percentage of non-executive directors.

12 This also reflects that there is no significant relationship between the likelihood of corporate failure and the proportion of affiliated directors (executive directors + grey directors).
The empirical results regarding board structure reflect that executive directors, grey directors and independent outside directors may have different influences on firm survival. Grey directors might have distinct role from both executive directors and independent outside directors. The findings regarding the grey directors might be extended to support a suggestion by the Hampel Report (1998) that non-executive directors who are not in the sense of independence may nonetheless contribute to the board. Three possible reasons could be used to explain the findings. First, compared to independent outside directors, grey directors have more personal or commercial ties with the companies and top management and thus they have more interests in the companies. They therefore may have higher incentive to provide effective advisory and monitoring to safeguard their interests, as well as shareholder’s interest.

Second, it is argued that it is costly for firms to transfer firm specific information to outside directors (Maug, 1997). Simultaneously, outside directors face information acquisition costs in contributing their knowledge to the firms (Linck et al., 2008). Additionally, Fama and Jensen (1983) suggested that inside director are also important to effective governance because they could provide useful information to outsiders for evaluating the performance of top management. Insiders have better access to information of business environment and decision made by the CEO; they therefore play an important monitoring role (Adams and Ferreira, 2007a). To extend those points to grey directors, unlike independent outsiders, grey directors are supposed to have close relationship with insiders. They may have more firm specific knowledge and are more informed about the firm’s opportunities and constraints than independent outsiders. They could be more capable to exercise their advisory and monitoring responsibilities.

Finally, Patro et al (2005) indicated that firms with higher growth opportunities are more likely to have greater insider representation in order to fulfill the demand for the strategy function of the board. However, the UK governance codes basically suggest firms to have more non-executive directors. Therefore, firms with greater growth opportunities may have greater incentives to employ more affiliated non-executive directors in response to the recommendation by the governance codes. In addition to the compliance of the codes, firms may also benefit from the expertise and resources provided by non-executive directors to satisfy their strategic needs. Consequently, non-failed firms, compared to failed firms, tend to have greater grey directors.

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13 For example, the Cadbury (1992) requires a minimum of three non-executive directors and majority of them should be independent.
4.2.3 Additional analyses

Additional analyses are also performed to examine the robustness of the results shown above. For the relationship between the likelihood of corporate failure and board composition, consistent to the result of the percentage of non-executive directors on board (PNED), the number of non-executive directors on board is significantly related to the likelihood of corporate failure negatively ($p < 0.05$). After categorizing number of non-executive directors into number of grey directors and number of independent outside directors, it is found that non-failed firms are more likely to employ greater number of grey directors on board ($p < 0.05$). The presence of grey directors on board is also negatively associated with the likelihood of corporate failure significantly ($p < 0.001$). However, the number of outside directors is not significantly related to the incidence of corporate failure.

Prior corporate governance studies provided inconclusive findings on the relationships between independent outside directors (e.g. Hermalin and Weisbach, 1991, Bhagat and Black, 2002), board size (e.g. Yermack, 1996, Eisenberg et al., 1998) and firm performance. Those conflicting results may suggest a trade-off between the advantages and disadvantage in independent outside directors and board size. Moreover, Byrd and Hickman (1992) examined the association between independent outside directors and the returns to shareholders of bidding firms in tender offer. They found a non-linear relationship between bidding firms’ abnormal stock return and the percentage of independent outside directors. Therefore, two additional tests were implemented to discuss whether the non-linear relationships exist between the likelihood of corporate failure, the proportion of independent outside directors and board size. However, the non-linear relationships are not significant.

In addition, previous literature has suggested interrelationships or tradeoffs between various internal governance mechanisms. This research therefore also employ the interactions between percentage of independent outsiders and leadership duality (Daily and Dalton, 1994a, Daily and Dalton, 1994b), managerial ownership (Agrawal and Knoeber, 1996, Bathala and Rao, 1995, Charitou et al., 2007, Raheja, 2005), CEO tenure (Bathala and Rao, 1995, Linck et al., 2008) and external block shareholdings (Charitou et al., 2007, Mak and Li, 2001) in the
regression models. However, those interactive variables were not found significantly related to the likelihood of corporate failure.

5. Summary and conclusions

This paper has employed UK data to examine the relationship between the likelihood of corporate failure and the board structure. This research empirically compares the board and financial characteristics of 79 failed firms to a set of time period, industry and size-matched non-failed firms. Notably, unlike prior literature, which often treat executive (inside) directors and grey directors as a single class (affiliated directors), this research distinguishes executive directors, grey directors and outside directors in the analyses since grey directors are not independent of management or company, but, according to the governance codes, they are generally expected to play a monitoring role as independent outside directors. Apparently, the function of grey directors still remains ambiguous and relatively little has been done to access the governance role and influence of grey directors in the existing corporate governance literature. Therefore, this research addresses the role of grey directors on the issue of firm survival.

The empirical results suggest that the likelihood of corporate failure is significantly related to the percentage of non-executive (executive) directors negatively (positively). After splitting non-executive directors into grey directors and independent outside directors, it is found that the non-failed firms are more likely to employ greater grey directors compared to the failed firms. On the other hand, the association between corporate failure and the proportion of independent directors is not significant. Additionally, the presence of leadership duality and board size are not associated with the incidences of corporate failure.

This research contributes to classify the relationship between the incidence of corporate failure and board structures in the UK context. Overall, the findings do not completely support the notion that independent boards are more effective in protecting shareholders. The results presented in this paper suggest that executive, grey and independent outside directors may have distinguishable governance roles and functions. The finding regarding the grey directors can be extended to reinforce a view by the Hampel Report (1998) that non-executive directors who are not in the sense of independence may nonetheless contribute to the board, which has not attracted too much attention in prior literature. This research also implicitly reflects that over-emphasizing on the independence of board is not favorable to firm survival.
REFERENCES


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DAHYA, J., MCCONNELL, J. J. & TRAVLOS, N. G. 2002. The Cadbury Committee,


MAK, Y. T. & LI, Y. 2001. Determinants of corporate ownership and board structure:


YERMACK, D. 1996. Higher Market Valuation of Companies with a Small Board of


### Table 1  Number of the Failed Companies and Nature of Failure from 1997 to 2005

<table>
<thead>
<tr>
<th>Nature of Failure</th>
<th>Frequency</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Delisting</td>
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<td>4%</td>
</tr>
<tr>
<td>Liquidation</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td>Receivership</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td>Administration</td>
<td>25</td>
<td>25%</td>
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#### Table 1a Yearly Nature of Failure

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<th>Liquidation</th>
<th>Receivership</th>
<th>Administration</th>
<th>Total</th>
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<tr>
<td>1999</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>2000</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>12</td>
</tr>
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<td>2001</td>
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<td>6</td>
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<td>14</td>
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<td>2002</td>
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<td>9</td>
<td>6</td>
<td>0</td>
<td>28</td>
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<td>7</td>
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<td>2004</td>
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<td>6</td>
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<td>2005</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Total</td>
<td>31</td>
<td>45</td>
<td>25</td>
<td>25</td>
<td>101</td>
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</table>

#### Table 2  Distribution of Failed Companies’ Age and Listing Years

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Cumulative %</th>
<th>Frequency</th>
<th>Cumulative %</th>
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<td>0-5</td>
<td>9</td>
<td>9%</td>
<td>24</td>
<td>24%</td>
</tr>
<tr>
<td>6-10</td>
<td>19</td>
<td>28%</td>
<td>30</td>
<td>53%</td>
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<tr>
<td>11-20</td>
<td>22</td>
<td>50%</td>
<td>19</td>
<td>72%</td>
</tr>
<tr>
<td>21-30</td>
<td>9</td>
<td>58%</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>31-40</td>
<td>4</td>
<td>62%</td>
<td>19</td>
<td>99%</td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>66%</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>51-60</td>
<td>3</td>
<td>69%</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>61-70</td>
<td>10</td>
<td>79%</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>71-80</td>
<td>9</td>
<td>88%</td>
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<td>100%</td>
</tr>
<tr>
<td>81-90</td>
<td>1</td>
<td>89%</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>91-100</td>
<td>1</td>
<td>90%</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Above100</td>
<td>10</td>
<td>100%</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td></td>
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#### Table 3  The distribution of FTSE Industrial Classifications for All Failed Companies and the Failed sample companies from 1997-2004

<table>
<thead>
<tr>
<th>Industrial Classifications</th>
<th>101 Failed Companies</th>
<th>79 failed Sample Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Materials</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Industrials</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>Consumer Goods</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Health Care</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Consumer Services</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Utilities</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Technology</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td>79</td>
</tr>
</tbody>
</table>
Table 4 Average Length of Time between the Failure Date and Delisting Date, Last Account Date or Last Account Issue Date for the 79 Failed Sample Companies

<table>
<thead>
<tr>
<th>Time difference</th>
<th>Average time length between the delisting date and failure date</th>
<th>Average time length between the last account date and failure date</th>
<th>Average time length between the last account issue date and failure date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.5 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.4 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.9 months</td>
<td></td>
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</tr>
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</table>

Table 5 Descriptive Statistics of the Sample and Univariate Analysis

Panel A: Continuous Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Failed firms</th>
<th>Non-failed Firms</th>
<th>Wilcoxon Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Min/Max</td>
<td>Std dev</td>
</tr>
<tr>
<td>PNED(%)</td>
<td>43.42</td>
<td>20/72.00</td>
<td>13.64</td>
</tr>
<tr>
<td>POUT(%)</td>
<td>29.45</td>
<td>0/57.30</td>
<td>15.43</td>
</tr>
<tr>
<td>PGREY(%)</td>
<td>13.05</td>
<td>0/50.00</td>
<td>16.21</td>
</tr>
<tr>
<td>BSIZE</td>
<td>6.20</td>
<td>4/9</td>
<td>1.51</td>
</tr>
<tr>
<td>DOWN(%)</td>
<td>14.31</td>
<td>0.12/53.09</td>
<td>16.06</td>
</tr>
<tr>
<td>CEOTEN</td>
<td>6.12</td>
<td>1/31</td>
<td>5.46</td>
</tr>
<tr>
<td>DAGE</td>
<td>52.00</td>
<td>42.00/62.0</td>
<td>3.94</td>
</tr>
<tr>
<td>BLOWN(%)</td>
<td>35.79</td>
<td>6.60/65.80</td>
<td>16.74</td>
</tr>
<tr>
<td>CFO</td>
<td>0.03</td>
<td>-0.25/0.30</td>
<td>0.13</td>
</tr>
<tr>
<td>LEV</td>
<td>0.26</td>
<td>0.00 / 0.57</td>
<td>0.17</td>
</tr>
<tr>
<td>LIQ</td>
<td>1.12</td>
<td>0.10/20.86</td>
<td>1.52</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.05</td>
<td>-0.53 / 0.25</td>
<td>0.20</td>
</tr>
<tr>
<td>Sales (m)</td>
<td>85.23</td>
<td>5.70 /440.30</td>
<td>109.57</td>
</tr>
<tr>
<td>COMAGE</td>
<td>37.99</td>
<td>1/110</td>
<td>32.95</td>
</tr>
</tbody>
</table>

Panel B: Categorical Variable

<table>
<thead>
<tr>
<th>Variables</th>
<th>Failed Firms</th>
<th>Non-failed Firms</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUALITY</td>
<td>Coded 1</td>
<td>16.77%</td>
<td>19.62%</td>
</tr>
<tr>
<td></td>
<td>Coded 0</td>
<td>83.23%</td>
<td>80.38%</td>
</tr>
</tbody>
</table>

1. ****, *** , ** and * indicate significance at p < 0.001, p < 0.01, p < 0.05 and p < 0.1, respectively, based on two tailed tests.
2. Wilcoxon rank sum tests for continuous variables; and chi-square tests for categorical variables.
### Table 6 Spearman’s rho correlations among independent variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
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<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
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<tr>
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</tr>
<tr>
<td>POUT</td>
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<tr>
<td>PGREY</td>
<td>0.42 *** -0.57 *** 1.00</td>
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<tr>
<td>BSIZE</td>
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</tr>
<tr>
<td>DUALITY</td>
<td>0.23 *** -0.06 -0.20 *** -0.11 *** 1.00</td>
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</tr>
<tr>
<td>DOWN</td>
<td>-0.30 *** -0.39 *** 0.14 *** 0.07 * 0.12 *** 1.00</td>
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<tr>
<td>CEOTEN</td>
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<tr>
<td>DAGE</td>
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<tr>
<td>BLOWN</td>
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<tr>
<td>CFO</td>
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<tr>
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</tr>
<tr>
<td>LIQ</td>
<td>0.15 *** 0.13 *** 0.03 0.02 0.06 -0.01 -0.12 *** -0.03 -0.13 *** 0.10 *** 0.47 *** 1.00</td>
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</tr>
<tr>
<td>COMAGE</td>
<td>0.00 0.07 * -0.08 ** -0.08 ** 0.13 *** -0.26 *** 0.11 *** 0.16 *** 0.26 *** 0.01 0.01 -0.04 1.00</td>
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</tbody>
</table>

***, ** and * indicate significance at p < 0.01, p < 0.05 and p < 0.1, respectively. (2 tailed)

### Table 7 Conditional Logistic Regression of the Incidence of Corporate Failure on the Board Composition

**Dependent Variable: 1: Failed Firms, 0: Non-failed Firms**

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNED</td>
<td>-0.017</td>
<td></td>
<td>-0.019</td>
</tr>
<tr>
<td></td>
<td>(-1.82) *</td>
<td></td>
<td>(-2.68) ***</td>
</tr>
<tr>
<td>POUT</td>
<td>0.009</td>
<td></td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>(1.25)</td>
<td></td>
<td>(1.25)</td>
</tr>
<tr>
<td>PGREY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSIZE</td>
<td>-0.034</td>
<td>-0.007</td>
<td>-0.017</td>
</tr>
<tr>
<td></td>
<td>(-0.46)</td>
<td>(-0.10)</td>
<td>(-0.23)</td>
</tr>
<tr>
<td>DUALITY</td>
<td>-0.445</td>
<td>-0.160</td>
<td>-0.413</td>
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<tr>
<td></td>
<td>(-1.26)</td>
<td>(-0.48)</td>
<td>(-1.17)</td>
</tr>
<tr>
<td>DOWN</td>
<td>-0.004</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(-0.61)</td>
<td>(0.17)</td>
<td>(0.17)</td>
</tr>
<tr>
<td>CEOTEN</td>
<td>-0.026</td>
<td>-0.027</td>
<td>-0.026</td>
</tr>
<tr>
<td></td>
<td>(-0.92)</td>
<td>(-1.00)</td>
<td>(-0.93)</td>
</tr>
<tr>
<td>DAGE</td>
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<td>-0.050</td>
<td>-0.046</td>
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<td>(-1.26)</td>
<td>(-1.59)</td>
<td>(-1.41)</td>
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<tr>
<td>BLOWN</td>
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<td>(-0.009)</td>
<td>-0.007</td>
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<tr>
<td></td>
<td>(-0.61)</td>
<td>(-1.00)</td>
<td>(-0.77)</td>
</tr>
<tr>
<td>CFO</td>
<td>-7.115</td>
<td>-7.474</td>
<td>-7.586</td>
</tr>
<tr>
<td></td>
<td>(-6.04) ****</td>
<td>(-6.06) ****</td>
<td>(-6.19) ****</td>
</tr>
<tr>
<td>LEV</td>
<td>2.121</td>
<td>2.200</td>
<td>2.180</td>
</tr>
<tr>
<td></td>
<td>(2.58) ***</td>
<td>(2.65) ***</td>
<td>(2.76) ***</td>
</tr>
<tr>
<td>LIQ</td>
<td>0.806</td>
<td>0.704</td>
<td>0.775</td>
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<td></td>
<td>(2.55) **</td>
<td>(2.15) **</td>
<td>(2.47) **</td>
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<tr>
<td>COMAGE</td>
<td>-0.209</td>
<td>-0.115</td>
<td>-0.157</td>
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<tr>
<td></td>
<td>(-1.89) *</td>
<td>(-1.00)</td>
<td>(-1.37)</td>
</tr>
</tbody>
</table>

Number of pairs 79 79 79
Log likelihood -150.808 -151.842 -148.306
Chi-square 84.91 74.24 80.82
Probability 0.000 0.000 0.000
Pseudo R² 0.312 0.307 0.323

****, *** and * indicate significance at p < 0.001, p < 0.01, p < 0.05 and p < 0.1, respectively. z statistics in parenthesis