Skill Specialist or Generalist?

Does CEO Substitute or Complement Directors?

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Abstract

The policy reforms on disclosure of individual skills and the increasing number of studies focusing on individual attributes of CEOs and directors motivate this research to explore the role of skill generality and specialty of CEO and directors. This study answers the research question of whether the skill generality or skill specialty is beneficial to the firm. Specifically, this research asks the following questions: (i) Are different dimensions of skills and skill generality beneficial to the firm? (ii) Is CEO skill generality complementary or substitutional to director skill generality in relation to better corporate performances and reduced risks? (iii) Do the complementary/substitutional effects of CEOs'/directors' skill generality on corporate outcomes change when firms face complex business? Using the data from 2006 to 2014 for Taiwan listed non-financial firms, we find that executives and board members with higher educational background and greater expertise and experiences contribute to higher performance and lower risks. In addition, we find that the expertise of CEO and directors and complementary to improve performance, while the educational background and prior experiences are substitutional between CEO and directors.

Keywords: Corporate Governance, CEO, Board of Directors, Skill.
JEL Classifications: G30, G34, E24, M12.
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1. Introduction

Recent literature addresses the increasing importance of the individual skills of CEOs and board directors, particularly since the 2009 Regulation S-K requirement of disclosure on individual skills of each director and any nominee for board member. Several studies indicate that skill generality is positively associated with corporate outcomes,[1] whereas other research reports that skill specialty is crucial.[2] Thus, the question of whether and, if so, how skill generality or skill specialty relates to corporate outcomes remains still controversial. This research helps to resolve this controversy and contributes to this line of literature by arguing that generalists and specialists can play complementary or substitutional roles to improve performance and reduce risk.

Using 2006–2014 data and proxy statements of Taiwan listed non-financial firms, this research decomposes CEO and director individual skills into three dimensions—education background, professional expertise, and prior experience—to answer the following questions: (i) Are CEOs/directors with higher education, greater professional expertise, more prior experiences, or greater skill generality associated with better corporate performance and reduced risks? (ii) Is skills generality of CEOs and directors complementary or substitutional in relation to improved corporate performance and reduced risks? (iii) Do the complementary or substitutional effects of skill generality on corporate outcomes change when firms face complex business decisions, such as acquisition activities?

The practical motivation of this study is based on the recent policy reforms in the disclosure requirements of individual skills. Individual characteristics are an important component of the selection process for executives and the board. The 2009 Regulation S-K requires that U.S. listed firms disclose for each director and any nominee for director his or her particular

[1] See Bertrand and Schoar (2003), Adams, Almeida, and Ferreira (2005), Lazear (2009), Giannetti (2011), White, Woidtke, Black, and Schweitzer (2014), Custódio, Ferreira, and Matos (2013), and Tate and Yang (2014).
[2] See Groysberg, McLean, and Nohria (2006), Fahlenbrach, Minton, and Pan (2011), and Mobbs and Raheja (2012), and Mobbs (2014).

experience, qualifications, attributes, and skills. These disclosures in form of a summary chart or table provides a simple but comprehensive picture of internal corporate governance practices and provides shareholders with an understanding of the criteria that the company considers in selecting director candidates. The disclosure also clearly explains how the criteria support the company's business and strategy. For practitioners, this information summarizes the company's understanding of how individual characteristics and specific qualifications, attributes, skills, and experience align with its board and business development. For academics, it provides a unique experiment to explore an individual-level data set of CEO and director characteristics and their role in corporate governance.

In addition to a practical application of this study's findings, the theoretical and empirical literature also motivates this research. First, inconsistent findings in current literature leave unanswered the question of whether individual skills actually contribute value to companies. Fich (2005), Drobetz, Von Meyerinck, Oesch, and Schmid (2013), Dass, Kini, Nanda, Onal, and Wang (2014), Faleye et al. (2012), Landier, Sauvagnat, Sraer, and Thesmar, (2013), and Kim and Lu (2014) find that the experiences of CEOs and directors make an important difference to firm value and corporate outcomes. However, Fahlenbrach, Low, and Stulz (2010) and Kang, Kim, and Lu (2013) find that experience has an insignificant effect on value creation. These recent studies emphasize two types of managerial human capital: skill generality, defined as skill that is not specific to any organization and is transferable across firms, and skill specialty, defined as firm-specific human capital valuable only within an organization.

Second, the question of whether the CEOs/directors skill generality or specialty results in better corporate outcomes is increasingly important. Financial economists acknowledge the influence of individual-specific attributes and characteristics on corporate outcomes (Hambrick and Mason, 1984). Bertrand and Schoar (2003) and Graham, Li, and Qiu (2009) note that executives' fixed effects are important determinants in corporate

decision-making, and Akyol and Verwijmeren (2013) argue that directors are not one dimensional. Kaplan and Klebanov (2012) and Custódio et al. (2013) use factor analysis to extract different dimensions of directors' skills to examine commonalities in CEO characteristics. They find that some firms appoint directors with different skills to their board, whereas others focus on the same kills. Falato, Li, and Milbourn (2011) report differences in CEOs' skills and find that these differences cause large differences in their compensation arrangements. Inspired by these works, this study examines how the generality and specialty of CEOs' and directors' individual skills interact to affect corporate outcomes.

The level of skill generality of different CEOs and directors varies, and these variations may result in different corporate outcomes. Thus, this study examines whether skill generalists (specialists) as directors favor a CEO with higher skill specialty (generality) to affect better business performace. From the perspective of the substitutional effect of skill generality between CEOs and directors, Adams, Akyol, and Verwijmeren (2013) and Nguyen, Hagendorff, and Eshraghi (2014) show that directors need common ground and highly concentrated skills to substitute for each other's skills in the boardrooms. In addition, most newly appointed CEOs and directors have different background characteristics compared to current board members (Zhu and Westphal, 2011), and these differences can enhance board control over CEO compensation arrangement[3] and bring different perspectives to firm decision-making and strategic assessments.[4] If skill generality between CEOs and directors have a complementary effect, CEOs and directors would prefer to work with individuals with background characteristics similar to them (Nielsen, 2009; Dah, Frye, and Hurst, 2014) to reduce uncertainties[5] and to improve decision-making.[6] Therefore, this

[3] See Finkelstein, Whitehead, and Campbell (2009), Zhu and Westphal (2011), and Westphal and Zajac (2013).
[4] See Peterson, Owens, Tetlock, Fan, and Martorana (1998), Hillman, Cannella, and Harris (2002), and Knyazeva, Knyazeva, and Rahej (2009).
[5] See Westphal and Zajac (1995), Young and Buchholtz (2002), and Zhu and Westphal (2011).
[6] See Pelled, Eisenhardt, and Xin (1999), Simons, Pelled, and Smith (1999), and Kaczmarek, Kimino, and Pye (2012).

study investigates whether a complementary substitutional effect of skill generality level between CEOs and directors contributes to the value of companies.

Our empirical findings show that executives and board members with higher educational background and greater expertise and experiences contribute to higher performance and lower risks. In addition, the skill generality is helpful to increase performance and reduce risk. Furthermore, we find that the expertise of CEO and directors and complementary to improve performance, while the educational background and prior experiences are substitutional between CEO and directors.

This research contributes to prior literature in a number of important ways. First, the individual skills of CEOs and directors, including their education background, professional expertise, and prior experience, are hand collected from Taiwan Economic Journal database and proxy statements. Thus, this research provides a comprehensive data set of CEO/director skills. Because individual characteristics and abilities are multidimensional and hard to observe and previous theoretical and empirical studies do not specifically indicate which particular characteristics are more important for corporate governance, this empirical study focuses on the most important manifest criterion, skills. An increasing number of studies focus on different criteria of skills, including education background, professional expertise, and prior experience. However, few studies consider all of the skills in combination. This study therefore complements previous studies by including all criteria of individual skills to provide a comprehensive examination of the roles of different skills in corporate governance.

Second, this empirical research includes the skills of both CEOs and directors. Custódio et al. (2013) use data on CEO prior experience as skills for the 1993–2007 period, and Adams et al. (2013) use 2009 data on directors' prior experience. Taking advantage of the disclosure policy reforms instituted by 2009 Regulation S-K, which require U.S. listed firms to disclose the particular individual attributes for each director and any nominee for director, this research adds to this line of literature by collecting 2010–2014 data on

education, expertise, and experience as skills of both CEOs and directors. These natural experiment data are unique and insightful and allow for the exploration of the effect of individual skills on corporate outcomes.

Third, this research helps to examine the debate over the value of generalist versus specialist as CEOs/directors. The crucial question of whether skill generalists or skill specialists are beneficial to business is still controversial (Lazear, 2004; Murphy and Zabojnik 2007; Cremers and Grinstein 2014; Custódio et al. 2013; Custódio and Metzger, 2013). Currently, little empirical evidence examines their interacting effect. This research argues that the level of skill generality of CEOs and directors can be complementary or substitutional in its influence on governance practices and corporate outcomes.

2. Theories and Lines of Literature

CEOs and directors skills are crucial in corporate decision-making and business operations. Their increasing importance is due to product market competition and industry deregulation (Hubbard and Palia, 1995; Cunat and Guadalupe, 2009a, 2009b). The literature shows that executives' major background characteristics, as reported in their biographies, can influence their strategic decision-making (Finkelstein et al., 2009) and performance (Gabaix and Landier, 2008). However, the scope of skills is multidimensional and multidisciplinary. For example, Adams and Ferreira (2009), Anderson, Reeb, Upadhyay, and Zhao (2011), and Knyazeva et al. (2011) indicate that heterogeneous skills are measured differently relative to firm value. Adams et al. (2013) indicate that boards vary in the variety of skills of their directors. Kaplan and Klebanov (2012) find that companies are more likely to conduct successful buyouts and venture capital transactions if executives are skilled in personal characteristics related to such activities. Following Custódio et al. (2013) and Falato et al. (2011) in constructing skills measures based on publicly observable data to reflect experience and educational and professional records, this research decomposes the skills of CEOs and

directors into three dimensions: education background, professional expertise, and prior experience.

2.1 Education Background as a Skill

CEO educational background provides a signal of skills to the board whether executives invest in costly education credentials. A high-quality education background can provide CEOs access to certain other elites including executives in other companies or experts in different areas (Spence, 1973). The quality of educational background, such as selective college or schooling, can proxy managerial talent over firm-specific human capital. In other words, elite educational institutions and number and type of degrees attained can reflect executive quality (Butler and Gurun, 2012). Educational networks can generate information flow that leads to improved CEO decision-making, outperforming portfolio trades (Cohen, Frazzini, and Malloy, 2010), and higher performance-sensitive compensation (Butler and Gurun, 2012).

Several studies argue that that education background signals individual talent and is an important determinant of compensation premium and shareholder wealth (Falato et al., 2011; Nguyen et al. 2014). In addition, appointees with an MBA degree have extensive social links developed during their time of study (Hochberg, Ljungqvist, and Lu, 2007; Shue, 2013). Engelberg, Gao, and Parsons (2012) consider the educational overlap of both executives and directors to measure potential network size. This research therefore suggests that educational background is a skill of CEOs and directors.

2.3. Professional Expertise as a Skill

Recent research indicates the importance of CEO professional expertise over firm-specific human capital. Fich (2005) finds that financial markets usually react favorably to the appointment of executives with expertise to boards of directors. Custódio et al. (2013)

examine CEO expertise and find an annual pay premium for generalist CEOs. In addition to executives' expertise, prior studies also investigate the role of professional expertise for board of directors. Some directors have potentially valuable professional expertise (Adams et al. 2013), such as legal (Krishnan, Wen and Zhao, 2011), foreign country (Masulis, Wang and Xie, 2012), or leadership or financial expertise (Fahlenbrach et al. 2010; Baxter, Bedard, Hoitash and Yezegel, 2013). During spin-offs activities, placement of directors on the board in either the parent or the acquired firm is related to whether the appointed directors can provide unique and varied expertise and different valuable sources to the board (Denis, Denis, and Walker, 2014).

Masulis, Ruzzier, Xiao, and Zhao (2012) report that industry-specific expertise for directors can help to reduce information asymmetry between directors and executives and allow them to perform their advisory and monitoring roles effectively to prevent value-destroying acquisitions and capital expenditures and to keep sufficient cash within the firms. Faleye et al. (2012) find that industry expertise on the board is related to higher firm value and performance because specialized expertise in certain business is an important qualification to serve in the boardroom and can be used to assess industry characteristics, competitive threats, strategic opportunities, industry connections, and informational benefits. Other research also highlights the role of financial expertise in firm decision-making (Guner, Malmendier, and Tate, 2008; Kroszner and Strahan, 2001). Therefore, the professional expertise of CEOs and directors are also taken as a needed skill.

2.4. Prior Experience as a Skill

CEO and director skills based on career experiences have a significant effect on different corporate outcomes, including CEO pay (Custódio et al. 2013), types of actions taken by executives (Hu and Liu 2015), and shareholder wealth (Nguyen et al. 2014). Fee and Hadlock (2003) adopt prior experience in stock price performance as a proxy for managerial ability

and find that experienced CEOs are more likely to be appointed by other firms and receive higher pay at the new firm.

Skills acquired from a diversified set of industry experiences are increasingly important (Lazear, 2004; Custódio et al., 2013; Cremers and Grinstein, 2014). Hu and Liu (2015) argue that prior executive or directorship positions provide signals of track record and past accomplishments as well as the existence of social ties and networks. CEO career experiences help firms to accumulate social connections (Hu and Liu. 2015), and experienced CEOs can expand company accessible resources by exploiting these personal social connections (Adler and Kwon, 2002). CEOs who have worked in different firms provide the new firm not only with knowledge gained through personal experiences with other firms' policies and practices but also through their relationships and communication links with former contacts and associates (Virany, Tushman, and Romanelli, 1992; Geletkanycz and Boyd, 2011). Engelberg et al. (2012) and Hu and Liu (2015) show that diverse external experiences helps CEOs to accumulate social connections that reduce information asymmetry and lower investment–cash flow sensitivity and thus increase a firm's access to more bank loans and trade credit for investments or to offset a shortage of working capital.

Prior research indicates that industry-specific experiences are necessary for successful acquisitions (Custódio and Metzger, 2013), corporate decision-making (Huang, 2014), and higher performance (Masulis et al., 2012). Industry-specific information and skills can be developed through industry experience (Masulis et al. 2012). Such industry experiences help executives be in a better position to make significant contributions. For example, CEOs who engage in the high-level executives' job market can accumulate substantial firm or industry experience (Giannetti, 2011). Huang (2014) finds that a better match between CEO industry expertise and assets improves firm value. Fahlenbrach, Minton, and Pan (2011) find that former CEOs with industry experience are more likely to be reappointed to the board because firms can benefit from their experience.

Dass et al. (2014) find that experienced directors appointed from related supplier and customer industries provide knowledge of a variety of corporate policies and help to bridge the information gap between supplier and customer. Directors with well-connected experience in the same industry have opportunities to obtain valuable information by accumulating more and higher level experience. These experiences lead to more advising and monitoring skills, and these skills ultimately lead to higher performance and lower leverage (Faleye et al. 2012; Masulis et al. 2012; Dass et al. 2014; Drobetz et al. 2013 Adams et al. 2013; Denis, Lee, and Lee, 2014). Therefore, based on theories and empirical findings in the literature, this research takes education background, professional expertise, and prior experience as a skill of CEOs and directors.

3. Hypothesis Development

The hypotheses are developed in the following to answer the research questions: (i) Do CEO/director better education backgrounds, greater professional expertise, more prior experiences, and higher skill generality lead to better corporate performances/risks? (ii) Are skills generality of CEOs and directors complementary or substitutional in relation to improved corporate performance and reduced risks? (iii) Does the complementary or substitute effects of skill generality on corporate outcomes changes when the firms are faced with complex business, such as acquisition activities?

3.1. Generalist or Specialist?

3.1.1. Skill Specialist as CEO/Director

CEOs and directors provide several benefits. Faleye et al. (2012) argue that specialized expertise is the most important qualifications that directors bring to the boardroom. Specialist CEOs bring firm-specific knowledge, which is an important dimension of the CEO skill set. Internal candidates for CEO have more firm-specific knowledge than external candidates

(Groysberg et al. 2006). For example, Mobbs and Raheja (2012) and Mobbs (2014) find that insiders with specific talent are valuable resources to their boards to force CEO turnover sensitivity and to improve accounting performance. In addition, Custódio et al. (2013) reports that specialist CEOs can encourage and promote other skilled specialists to invest in innovation and to identify good projects. Fahlenbrach et al. (2011) note that former CEO's specific knowledge can help the board to overcome some of the difficulties in evaluating current CEO's performance and to increase performance–turnover sensitivity.

This line of research also indicates that specialists have potential drawbacks. Internal candidates for CEO usually do not hold a top position at the corporation and therefore may lack leadership skills (Groysberg et al. 2006). In addition, Brockman, Lee, and Salas (2012) find that CEOs with more in-house experience receive lower total compensation arrangements, higher cash payment, fewer performance-based incentives, and lower wealth–risk sensitivities.

3.1.2. Skill Generalist CEO/Director

Some related literature argues that generalist CEOs and directors provide benefits to the firm. For example, generalist executives are better at thinking outside the box to take advantage of knowledge beyond the current technological domain (Custódio et al. 2013). Lazear (2009) develops a theory that firms weigh various skills differently and finds that diversified firms usually need across-industries experiences. Tate and Yang (2014) show that individuals leaving diversified firms have better outcomes in labor market. Also, Custódio and Metzger (2013) note that generalist CEOs spur innovation because they have different skills that can be easily applied elsewhere.

Prior literature also shows that managerial heterogeneity affects corporate actions and performance (Bertrand and Schoar, 2003; Adams et al. 2005; Bennedsen, Perez-Gonzalez, and Wolfenzon, 2008). Knyazevaa et al. (2009) indicate that heterogeneity in board member

expertise influences the board's coordination costs to evaluate managers and its ability to formulate corporate strategies. Particularly, uncertainty in the business environment and product markets increases the benefits of diverse board expertise and skill sets by helping companies move forward in the uncertainty conditions. Appointing academics from different fields or research areas who have varied expertise and networks as outside directors leads to a favorable market reaction and highlights the importance of skill heterogeneity in the director selection process (Whiteet al. 2014).

By working in multiple positions, generalists accumulate firm and industry experiences. Thus, these executives may engage in job hopping because they are more commonly recruited and can move across industries more easily than specialists (Giannetti, 2011; Custódio et al. 2013). Because generalist CEOs are more high profile, many studies explore how general skills contribute to increased executive compensation (Murphy and Zabojnik, 2007). Custódio et al. (2013) find a pay premium for generalist CEOs, thus providing direct evidence of the importance of general managerial skills over firm-specific human capital in the market for CEOs. The generalist pay premium is particularly higher when generalist CEOs are appointed to perform complex tasks such as restructurings and acquisitions.

Similar to specialist CEOs and directors, the literature reveals potential drawbacks for generalist CEOs or directors. Murphy and Zabojnik (2007) develop a model of generalist pay premium and find that the premium surplus generated by general skills does not lead to higher firm value and performance-sensitive turnover. Custódio et al. (2013) use firm fixed effects and annual changes regressions to measure the index of general skills and find a negative relation between generalist CEO pay premium and accounting and stock market performance. This finding is consistent with Gabaix and Landier's (2008) model, which shows that a small dispersion of CEO talent results in higher firm value and higher CEO compensation.

3.2. Hypothesis: Skill Specialist or Skill Generalist

Although the literature shows that both generalists and specialists can be beneficial to companies in different ways, extant empirical results are inconsistent and the question of whether CEO/director skill generality or specialty is more helpful to the firm and its board is controversial. From the perspective of the nominating and appointing process, Murphy and Zabojnik (2007) argue that general managerial skills have become more important than firm-specific skills. Generalists can acquire higher compensation rents as skills can be applied elsewhere, thereby reducing specialists' bargaining power in labor market. Custódio et al. (2013) indicate that outside hires are more likely than internal promotions because the benefit of a better match between an outside-appointed generalist CEO and the firm outweighs the cost of a lack of internal firm-specific capital. Custódio et al. (2013) find that the CEO pay premium increases 19% when firms appoint an external CO and switch from a specialist to a generalist because, compared to specialist CEOs, generalist CEOs bring broader benefits from the outside that can foster innovation.

From the perspective of skill generality and specialty, Adams et al. (2013) show that outside directors have 2.7 skills, compared to 2.2 skills for inside directors. Custódio et al. (2013) find that firms with CEOs with more general managerial skills and experiences are more likely to exploit innovative projects, invest more in research and development (R&D), and produce more patents. They also find that generalists with more diverse business experiences are less sensitive to termination risk compared to CEOs with focused professional experience. Manso (2011) and Almeida, Hsu, and Li (2012) show that generalist CEOs engage more in exploratory strategies that involve higher risk-taking in the search for new technologies than exploitative strategies that refine existing technologies. Thus, we hypothesize that, relative to skill specialty, skill generality is more beneficial to corporate outcomes.

Hypothesis 1a: *Skill generalists as CEOs and board directors help to create*

better corporate performance and reduce risk.

Another argument suggests that generalist CEOs are not necessarily the best match for every firm and that specialists help to create better performance because complex business operations require more specific advice and greater expertise. Companies thus with greater need for firm-specific knowledge require large boards (Coles, Daniel, and Naveen, 2008). Dah et al. (2014) suggest that costs are associated with transforming generalists' knowledge and experience to firms as they lack firm-specific information. Adams et al. (2013) find that skills variety does not improve firm performance, suggesting that directors with a skill-concentrated background provide benefits to firm performance. This research therefore provide a competing hypothesis that, compared to skill generality, skill specialty is beneficial to corporate outcomes.

Hypothesis 1b: *Skill specialists as CEOs and board directors help to create better corporate performance and reduce risk.*

3.3. Hypothesis: Complementary versus Substitutional

Because prior research on generalist or specialist CEOs and directors provides inconsistent findings on corporate outcomes, this study argues that CEOs and directors may choose complementary or substitutional roles in skill generality. From the perspective of the influence of executives on board directors, the directorship market provides an effective mechanism to identify managerial skill and talent for nominating candidates (Mobbs, 2014). Denis et al. (2014) suggest that board composition can reflect the particular preferences of current CEO. From the perspective of the influence of board directors on executives, boards are more likely to appoint executives from other well-performing firms with premium compensation for this performance difference (Fee and Hadlock, 2003). Also, Fich, Starks, and Yore (2014) show that boards consider CEOs' skills deal-making and leadership when

determining CEO compensation arrangements. Fee, Hadlock, and Pierce (2013) find that executive-specific attributes are shaped by the board of directors and that boards appoint new executives with the desired characteristics to strategically align firm with the board. In addition, generalist CEOs are high profile and attract more attention from boards. Therefore, based on the previous literature, this study presumes that the board of directors considers individual skills when nominating, incentivizing, and evaluating executives and that CEOs consider director skills in director selection.

Several studies find that appointing directors with diversified skills or characteristics improves the board's decision-making. For example, Sibert (2003) shows that greater aggregation across heterogeneous director skills results in smoother committee decision-making. Also, based on resource theory, Nguyen et al. (2014) find that a firm's improvement in human capital is smaller when internal candidates are appointed, suggesting that externally appointed directors are substitutes for the skills needed in the boardroom. Adams et al. (2013) report that firms with directors with highly concentrated skills or with common ground between inside and outside directors have fewer board meetings and committees with less specialized members. This relation is positively related to firm performance as directors with a lower concentration of skills communicate more effectively and interact more with members with different skill sets. In addition to research on the differences in skill among directors, an increasing number of studies focus on the heterogeneity between executives and board directors.

Although prior literature has traditionally suggested that directors and CEOs have similar background characteristics (Westphal and Zajac, 1995; Young and Buchholtz, 2002), Zhu and Westphal (2011) find that most new directors differ from the CEO in demographic characteristics. Research also shows that the difference in demographic background between CEOs and directors is increasingly crucial (Daily, Certo, and Dalton, 1999; Hillman et al., 2002; Hillman et al. 2007; Westphal and Stern, 2006) and that such difference can enhance

board control over CEO compensation arrangements (Finkelstein et al., 2009; Zhu and Westphal, 2011; Westphal and Zajac, 2013). In addition, directors with backgrounds that differ from the CEO bring unique perspectives to firm decision-making and strategic assessments, which can improve corporate outcomes (Finkelstein et al., 2009; Hillman et al., 2002; Peterson et al., 1998; Finkelstein et al., 2009). Knyazeva et al. (2009) also find that CEOs can take advantage of differences in board member expertise to make corporate decisions and expertise heterogeneity leads to variation in forecasts of investment outcomes.

However, whether the heterogeneous level of skill generality between executives and directors is beneficial to the business operation is an open question. Namely, how is the heterogeneity resolved? CEOs who appoint new directors with dissimilar backgrounds and demographic attributes can resolve the dilemma by finding common values and beliefs and reduce less favorable views through social interaction (Knyazeva et al., 2009). Also, CEOs who face more pressure from shareholders and corporate governance reform are more likely to appoint directors with different backgrounds from them (Filatotchev and Toms, 2003; Nielsen and Huse, 2010). Thus, this study hypothesize that the heterogeneity of skill generality between CEOs and directors is substitutional and leads to better corporate outcomes.

Hypothesis 2a: *CEOs and directors act as substitutes in the level of skill generality to achieve higher corporate performance and lower risk.*

The competing hypothesis for H2a is that the heterogeneity of skill generality between CEOs and directors is not necessarily beneficial to corporate outcomes. Individuals are usually attracted to others who are similar to them and evaluate them more positively and attractively based on their common beliefs (Montoya and Horton, 2004). For example, CEOs

favor directors with similar backgrounds to them (Nielsen, 2009) to reduce uncertainties (Kaczmarek et al. 2012; Westphal and Zajac, 1995; Young and Buchholtz, 2002). In addition, CEOs with a finance background perceive directors with a similar background as attractive because the CEOs presume that directors with a common background will be more likely to share and validate their decisions (Kaczmarek et al. 2012; Westphal and Zajac, 1995). Therefore, CEOs prefer to appoint board members with prior experiences similar to theirs to facilitate a positive relationship (Zhu and Westphal, 2011).

Board directors also prefer executives with similar experiences and skills because they fit well with the firm (Dah et al. 2014). Zhu and Westphal (2011) note that directors with different background characteristics from the CEO are less likely to appreciate CEOs' decisions and CEOs have limited information about directors' preferences. Overall, having a board with members who share common backgrounds can facilitate effective decision-making (Pelled et al. 1999; Simons et al., 1999). Knyazeva et al. (2009) argue that divergence in director abilities and expertise can lead to ineffective decision-making and more conflicts in the board. Thus, the competing argument hypothesizes that the skill generality between CEOs and directors is complementary and leads to better corporate outcomes.

Hypothesis 2b: *CEOs and directors are complementary in the level of skill generality to have higher corporate performance and lower risk.*

Other firm characteristics, such as company size and business complexity, may also affect the complementary or substitutional effect of skill generality on performance and risk. Complex business needs larger boards and members with more firm-specific knowledge and a greater variety of expertise who can provide quality advice (Coles et al., 2008). Ferreira and Sah (2012) suggest that generalist managers occupy top spots in the corporate hierarchy due to increased business environment complexity and improved communication technologies.

Hambrick and Mason (1984) argue that executives characteristics matter because idiosyncratic experiences affect their strategic decision-making and performance and that this effect is most salient when the decisions are complex and uncertain.

Custódio and Metzger (2013) show that when the acquirer CEO has prior experience in the target industry, the acquirer's announcement returns are higher. Experiences in government or financial institutions also improve corporate financial decision-making (Hu and Liu, 2015). Using firm size (Boone, Field, Karpoff, and Raheja, 2007; Coles et al., 2008) and acquisition activity (McDonald, Westphal, and Graebner, 2008) as proxies for the scope and complexity business operations, this research hypothesizes that the degree to which the firm faces complex operations influences the relation between the complementary or substitutional effect of skills generality and corporate performance and risk.

Hypothesis 3: *The complementary or substitutional effect of skills generality between CEOs and directors changes when business activities are complex.*

4. Research Method

4.1. Data

Data are collected from the Taiwan listed non-financial firms from 2006 to 2014. This time period is selected because the 2006 Regulation requires Taiwan listed firms to disclose the particular experience, qualifications, attributes or skills of each of the executives and directors. Because this research explores skills along three dimensions (education background, professional expertise, and prior experience), the 2006 disclosure policy reforms provide a unique and comprehensive data set to explore the properties of individual skills and background characteristics of directors. The detailed data on individual skills of directors and executives are acquired from Taiwan Economic Journal database and corporate annual

reports.

4.2. Variables

4.2.1 Education Background

The education variable is scored 1 for each of the following criteria that a CEO or director satisfies.

1. *BA* is a dummy variable that equals 1 if the CEO's highest educational degree is bachelor's degree, and zero otherwise.
2. *MBA* is a dummy variable that equals 1 if the CEO's highest educational degree is master's degree, and zero otherwise.
3. *PhD* is a dummy variable that equals 1 if the CEO's highest educational degree is PhD, and zero otherwise.

EDU is the level of educational background which is sum of the above educational degrees, ranged from 0 to 3.

4.2.2. Professional Expertise

The expertise variable is scored 1 for each of the following criteria that a CEO/director satisfies.

1. *Finance* is a dummy variable that equals 1 if the CEO/director has banking, economics, or finance expertise in his or her background, and zero otherwise.
2. *Accounting* is a dummy variable that equals 1 if the CEO/director has accounting or auditing expertise in his or her background, and zero otherwise.
3. *Governance* is a dummy variable that equals 1 if the CEO/director has corporate governance expertise in his or her background, and zero otherwise.
4. *Compensation* is a dummy variable that equals 1 if the CEO/director has compensation and incentives expertise in his or her background, and zero otherwise.
5. *Legal* is a dummy variable that equals 1 if the CEO/director has governmental, policy,

regulatory, or legal expertise in his or background, and zero otherwise.

6. *International* is a dummy variable that equals 1 if the CEO/director has international affair expertise in his background and zero otherwise.
7. *Leadership* is a dummy variable that equals 1 if the CEO/director is someone that has leadership, management, or communications expertise in his or her background, and zero otherwise.
8. *R&D* is a dummy variable that equals 1 if the CEO/director has engineering, scientific, technology, or R&D expertise in his or her background, and zero otherwise.
9. *Manufacturing* is a dummy variable that equals 1 if the CEO/director has manufacturing expertise in his or her background, and zero otherwise.
10. *Marketing* is a dummy variable that equals 1 if the CEO/director has marketing or sales expertise in his or her background, and zero otherwise.
11. *Risk* is a dummy variable that equals 1 if the CEO/director has risk management expertise in his or her background, and zero otherwise.
12. *Strategies* is a dummy variable that equals 1 if the CEO/director has strategy planning expertise in his or her background, and zero otherwise.
13. *Sustainability* is a dummy variable that equals 1 if the CEO/director has environmental or sustainability issues expertise in his or her background, and zero otherwise.

PRO is the level of expertise which is the sum of the above expertise variables, ranged from 0 to 13.

4.2.3. Prior Experience

The experiences variable is scored 1 for each of the following criteria that a CEO/director satisfies.

1. *Academic* is a dummy variable that equals 1 if the CEO/director is from academia, and zero otherwise.

2. *Firm* is a dummy variable that equals 1 if the CEO/director has worked for other companies, and zero otherwise.
3. *Industry* is a dummy variable that equals 1 if the CEO/director has worked in other industries, and zero otherwise.
4. *Experience* is a dummy variable that equals 1 if the CEO/director had held CEO position at another company, and zero otherwise.
5. *Conglomerate* is a dummy variable that equals 1 if the CEO/director had worked for multisegmented company, and zero otherwise.
6. *Recession* is a dummy variable that equals 1 if the CEO/director experienced a recession year, defined by National Bureau of Economics Research, after his or her first academic-degree graduation, and zero otherwise.
7. *OutsideBoard* is a dummy variable that equals 1 if the CEO/director has outside board experience, and zero otherwise.
8. *OutsideExecutive* is a dummy variable that equals 1 if the CEO/director was an executive of another company, and zero otherwise.
9. *Entrepreneurial* is a dummy variable that equals 1 if the CEO/director has entrepreneurial experience, and zero otherwise.

EXP is the level of experuence which is the sum of the above experience variables, ranged from 0 to 9.

4.2.4. Skill

The CEO/director skills variable is scored based the following criteria.

1. *EDU* is the sum of all dimensions of education background is scored from zero (lowest educational background) to 3 (highest educational background.
2. *PRO* is the sum of all dimensions of education background is scored from zero (less professional expertise) to 13 (most professional expertise).

3. *EXP* is the sum of all dimensions of education background is scored from zero (fewest prior experiences) to 9 (most prior experiences).
4. GNR is the s*kill generality*, measured by the first factor of the principal components analysis of the three dimensions of skills, including *EDU*, *PRO*, and *EXP*. A lower (higher) index score indicates that the CEO/director is a specialist (generalist).

4.2.5. Performance

Performance proxies are as follows:

1. *ROE* is the ratio of net income to total assets;
2. *EPS* is earnings per share;

4.2.6. Risk

Risk proxies are as follows:

1. ZSCR is z-socre, calculated by the formula: z-socre = 1.2 * (working capital / total assets) + 1.4 * (retained earnings / total assets) + 3.3 * (earnings before interest and taxes / total assets) + 0.6 * (market value of equity / total liabilities) + 0.99 * (sales / total assets).
2. σ(*ROE*) is the standard deviation of *ROE* in last 12 quarters

Table 1 provides descriptive statistics of the variables used in this research.

Table 1: Descriptive Summaries and Correlation Coefficients

		Mean	Std. Dev.	Min	Max	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ROE	(1)	1.48	0.76	-2.71	5.37	-0.21	0.50	-0.02	-0.02	0.11	-0.10	0.04	0.07	-0.34	0.04	-0.13	0.00	0.09	0.06	-0.09
EPS	(2)	1.66	0.86	-2.80	18.60	1.00	-0.08	0.03	-0.05	-0.12	0.07	-0.03	0.02	0.09	0.03	0.08	0.02	-0.27	-0.06	0.04
ZSCR	(3)	0.65	0.39	0.02	4.03		1.00	0.00	0.00	0.00	-0.05	-0.17	-0.05	-0.18	0.18	-0.12	0.12	0.03	-0.02	-0.11
$\sigma(ROE)$	(4)	0.16	0.37	0.00	1.00			1.00	0.09	0.12	0.04	0.03	0.09	-0.11	0.01	-0.01	-0.10	-0.17	-0.01	0.26
fsize	(5)	22.81	1.49	18.86	28.53				1.00	0.28	0.13	0.02	0.02	-0.06	-0.03	0.09	-0.03	-0.04	-0.05	0.06
lvrg	(6)	0.50	0.13	0.03	0.98					1.00	0.07	-0.05	0.13	0.07	-0.04	-0.02	-0.09	0.02	-0.04	0.01
mbr	(7)	0.66	0.52	0.04	10.54						1.00	0.12	0.01	-0.04	0.00	-0.01	-0.04	-0.06	0.04	0.08
tgbl	(8)	0.31	0.18	0.00	0.95							1.00	-0.05	0.00	0.03	0.00	0.00	-0.05	0.02	0.08
prft	(9)	0.02	0.04	-2.77	0.84								1.00	0.18	-0.15	-0.10	-0.47	-0.06	-0.06	-0.02
bsize	(10)	7.06	2.16	3.00	20.00									1.00	-0.01	0.05	0.10	0.01	-0.05	0.01
dual	(11)	0.46	0.49	0.00	1.00										1.00	0.63	0.14	0.03	0.03	-0.06
indp	(12)	0.16	0.19	0.00	1.00											1.00	0.12	-0.02	-0.09	0.01
inst	(13)	0.38	0.22	0.00	1.00												1.00	0.10	-0.05	-0.16
mngr	(14)	0.01	0.02	0.00	0.28													1.00	0.01	-0.19
blck	(15)	0.22	0.11	0.00	0.79														1.00	-0.10
devt	(16)	0.84	0.24	0.00	1.00															1.00

5. Empirical Finding

5.1 Regression Model

Table 2 provides the discrepancy analyses that examine hypotheses *H1a* and *H1b*, which posit that skilled generalist and specialist CEOs/directors, respectively, help to improve corporate performance and reduce risk. Using panel data estimations, this research also examines whether different dimensions of skills provided by the CEOs and directors lead to variation in corporate performance and risk. Specifically, the performances and risks are regressed by different dimensions of CEOs and directors skills with firm characteristics as control variables as

$$Performance/Risk = f(CEOs/Directors\ EDU, Control\ Variables) \quad (1)$$

$$Performance/Risk = f(CEOs/Directors\ PRO, Control\ Variables) \quad (2)$$

$$Performance/Risk = f(CEOs/Directors\ EXP, Control\ Variables) \quad (3)$$

$$Performance/Risk = f(CEOs/Directors\ GNR, Control\ Variables) \quad (4)$$

Control variable includes firm characteristics, governance characteristics, and loan characteristics.

Firm Characteristics:

(1) fsize: firm size is the natural logarithm of total assets

(2) lvrg: leverage is ratio of total debts including long-term debt and short term debt to total assets

(3) tgbl: tangibility is the ratio of property, plant, and equipment plus inventories to total assets

(4) prft: profitability is the ratio of net income to total sales

(5) mbr: market to book ratio is the ratio of market value to total assets

Governance Characteristics:

(6) bsize: board size is the natural logarithm of number of board directors

(7) dual: duality is a dummy variable that equals 1 if the CEO fulfills both the function as CEO and chairman of the board of directors, and 0 otherwise

(8) indp: independence is a dummy variable that equals 1 if firms have independent board in their board, and 0 otherwise

(9) inst: institutional shareholding is the ratio of the number of shares held by institutional investors to the number of shares outstanding

(10) mngr: managerial shareholding is the ratio of the number of shares held by executives to the number of shares outstanding

(11) blck: blockholder shareholding is the ratio of the number of shares held by 10 largest shareholders to the number of shares outstanding

(12) devt: deviation ratio is the ratio of voting rights to cash-flow rights

Models 1 to 3 examine the effects of different dimensions of skills on corporate performance and risk. A positive (negative) effect is expected on performance (risk). Model 4 examines hypotheses *H1a* and *H1b* to determine whether generalists (higher *Skills* index score) or specialists (lower *Skills* index score) as CEOs and directors contribute to better performance and reduced risk.

The empirical results for Hypotheses 1a and 1b are provided in Table 2. The evidence shows that executives and board members with higher educational background and greater expertise and experiences contribute to higher performance and lower risks.

Table 2: Effect of Skills on Performance and Risk

Panel A

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EDU	0.21**	0.05	0.15***	-0.46				
	(2.11)	(0.07)	(3.50)	(-1.37)				
PRO					0.19***	0.13*	0.01*	-0.96**
					(3.39)	(2.26)	(2.16)	(-2.80)
fsize	0.24	0.11	0.23	0.64	0.24	0.10	0.23	1.13
	(1.86)	(0.45)	(1.87)	(0.66)	(1.98)	(0.39)	(1.84)	(1.14)
lvrg	0.94*	-0.97	0.49*	-8.38	0.63**	-1.05	0.41*	-9.55
	(2.18)	(-0.85)	(2.30)	(-1.89)	(2.97)	(-0.88)	(2.06)	(-1.85)
mbr	0.01	-0.02	0.01	3.88*	0.00	-0.02	0.01	4.29*
	(0.67)	(-0.90)	(1.39)	(1.99)	(0.23)	(-0.77)	(1.16)	(2.31)
tgbl	-0.84	2.67*	-0.42	7.47*	-1.24	2.78*	-0.44	8.29*
	(-1.30)	(2.02)	(-1.16)	(2.74)	(-1.97)	(2.28)	(-1.22)	(2.69)
prft	0.01	-0.02	0.01	0.07	0.02	-0.02	0.01	0.06
	(1.70)	(-0.89)	(1.20)	(1.03)	(1.96)	(-0.94)	(1.23)	(0.99)
bsize	-3.31***	-15.40	0.41	2.12*	-3.62***	-15.33	0.80	7.73**
	(-4.49)	(-1.86)	(0.36)	(2.12)	(-1.66)	(-1.88)	(0.71)	(3.47)
dual	0.17	-0.54	0.04	0.04	0.23	-0.56	0.07	-0.28
	(1.06)	(-1.24)	(0.55)	(0.07)	(1.45)	(-1.26)	(0.91)	(-0.46)
indp	0.87	2.02	0.84*	-0.52	1.02	1.98	0.90*	-1.27
	(1.29)	(1.38)	(2.06)	(-0.24)	(1.43)	(1.48)	(2.15)	(-0.64)
inst	0.00	0.00	0.00	0.05**	0.00	0.00	0.00	0.05***
	(1.60)	(0.06)	(1.16)	(2.93)	(1.92)	(0.01)	(1.27)	(4.33)
mngr	0.10	-0.20*	-0.05	-1.52	0.06	-0.19*	-0.07	-1.35
	(0.62)	(-2.41)	(-0.57)	(-1.23)	(0.38)	(-2.39)	(-0.74)	(-1.24)
blck	0.48	1.49**	0.39*	-1.49	0.49	1.49**	0.39*	-1.25
	(1.46)	(2.83)	(2.15)	(-1.36)	(1.40)	(2.86)	(2.09)	(-1.71)
devt	-0.05	-0.44	-0.25	4.66*	-0.13	-0.42	-0.28	5.80**
	(-0.09)	(-0.52)	(-0.84)	(2.55)	(-0.20)	(-0.53)	(-0.89)	(2.87)
constant	-11.04*	-27.55**	-16.72**	3.12	-12.94*	-26.22*	-16.72**	4.09
	(-2.41)	(-3.06)	(-3.30)	(0.30)	(-2.63)	(-2.44)	(-3.13)	(0.39)
N	119	113	127	107	119	113	127	133
R^2	0.326	0.279	0.369	0.529	0.327	0.280	0.357	0.562

Table 2 continues

Table 2 (*continued*)

Panel B

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EXP	0.33*	-1.33	0.02	-4.07*				
	(2.04)	(-1.85)	(0.12)	(-2.50)				
GEN					0.54**	2.39*	0.25	-0.76**
					(3.56)	(2.08)	(0.92)	(-2.75)
fsize	0.21	0.25	0.23	1.03	0.22	0.16	0.22	0.82
	(1.71)	(0.94)	(1.75)	(0.82)	(1.70)	(0.59)	(1.79)	(0.89)
lvrg	0.69**	-1.11	0.40*	-11.38*	0.85*	-0.81	0.42	-8.97*
	(2.74)	(-0.98)	(2.08)	(-2.29)	(2.38)	(-0.65)	(1.96)	(-1.99)
mbr	0.00	-0.02	0.01	4.81*	0.01	-0.02	0.01	4.14*
	(0.47)	(-0.88)	(1.20)	(1.97)	(0.53)	(-0.99)	(1.22)	(2.19)
tgbl	-1.04	2.25	-0.42	9.35*	-1.06	2.69*	-0.45	8.05*
	(-1.74)	(1.73)	(-1.21)	(2.36)	(-1.72)	(2.22)	(-1.32)	(2.77)
prft	0.01	-0.01	0.01	0.08	0.02	-0.03	0.01	0.06
	(1.61)	(-0.50)	(1.25)	(1.01)	(1.91)	(-1.20)	(1.41)	(1.09)
bsize	-3.52*	-14.33	0.76	8.41*	-2.60***	-9.04	0.27	5.69**
	(-2.60)	(-1.83)	(0.68)	(2.49)	(-4.15)	(-1.00)	(0.26)	(3.32)
dual	0.22	-0.59	0.07	-0.11	0.20	-0.55	0.07	-0.19
	(1.46)	(-1.34)	(0.94)	(-0.19)	(1.30)	(-1.28)	(0.92)	(-0.32)
indp	1.02	1.78	0.90*	-1.28	1.01	2.03	0.92*	-0.94
	(1.55)	(1.22)	(2.13)	(-0.59)	(1.48)	(1.56)	(2.19)	(-0.46)
inst	0.00*	-0.00	0.00	0.06***	0.00	-0.00	0.00	0.05***
	(2.04)	(-0.09)	(1.24)	(3.34)	(1.73)	(-0.10)	(1.30)	(3.43)
mngr	0.07	-0.26*	-0.07	-2.33	0.07	-0.14*	-0.07	-1.35
	(0.48)	(-2.55)	(-0.73)	(-1.45)	(0.47)	(-2.30)	(-0.80)	(-1.30)
blck	0.51	1.43*	0.40*	-1.55	0.49	1.48**	0.40*	-1.07
	(1.57)	(2.61)	(2.09)	(-1.63)	(1.45)	(2.82)	(2.16)	(-1.37)
devt	-0.20	-0.05	-0.29	7.73***	-0.10	-0.46	-0.29	4.96**
	(-0.34)	(-0.06)	(-0.90)	(3.99)	(-0.17)	(-0.59)	(-0.96)	(2.70)
constant	-0.62	-2.25**	-0.49	0.85	-0.59	-2.27**	-0.49	0.17
	(-1.52)	(-3.15)	(-1.88)	(0.52)	(-1.39)	(-3.40)	(-1.93)	(0.15)
N	119	113	127	133	119	113	127	130
R^2	0.330	0.320	0.357	0.601	0.326	0.310	0.362	0.551

Notes: The models are estimated by OLS with robust standard errors clustered at the level of acquirer banks. t-statistics are reported in parentheses. Symbols ***, ** and * indicate significance at the 0.01, 0.05 and 0.1 levels, respectively.

Hypotheses *H2a* and *H2b* explore whether the skill generality of CEOs and directors are complementary to or substitutional related to performance and risk. Specifically, if both CEO and director education, expertise, or experience are significantly higher (H/H), CEOs skills and director skills are complementarily related to improved performance and reduced risk. If either CEO or director education, expertise, or experience are significantly lower (L/H and H/L, respectively), CEOs skills and director skills act as substitutes.

Table 3 Subsample identification

	Director Education, Expertise, Experience, or Skills			
Performance / Risk	High 30%	Medium 40%	Low 30%	High minus Low
High 30%	(H/H)	(M/H)	(L/H)	
Medium 40%	(H/M)	(M/M)	(L/M)	
Low 30%	(H/L)	(M/L)	(L/L)	
High minus Low				

To examine whether CEO and director skills are complementary or substitutional in the level of skill generality as related to their influence on corporate performance and risky, we follow Becher and Frye's (2011) method to examine the complementary and substitutional effects. If CEO skill generality substitutes for director skill generality, firms with higher skill-generality CEOs will appoint specialists directors. Similarly, if boards are composed of generalist directors, they will nominate and appoint specialist CEOs. Therefore, the following regression models specifically examines a subsample in which all dimensions of director skills are in the low 30% grouping for director education, expertise, or experience (L/H, L/M, and L/L; see Table 3):

$$Performance/Risk = f(CEOs\ Education, Control\ Variables) \quad (5)$$

$$Performance/Risk = f(CEOs\ Expertise, Control\ Variables) \quad (6)$$

$$Performance/Risk = f(CEOs\ Experience, Control\ Variables) \quad (7)$$

$$Performance/Risk = f\,(CEOs\ Skill\ Generality, Control\ Variables) \quad (8)$$

Likewise, the following regression models examine the subsample in which all dimensions of CEO skills are in the low 30% grouping in CEO education, expertise, or experience (H/L, M/L, and L/L; see Table 3):

$$Performance/Risk = f\,(Directors\ Education, Control\ Variables) \quad (9)$$

$$Performance/Risk = f\,(Directors\ Expertise, Control\ Variables) \quad (10)$$

$$Performance/Risk = f\,(Directors\ Experience, Control\ Variables) \quad (11)$$

$$Performance/Risk = f\,(Directors\ Skill\ Generality, Control\ Variables) \quad (12)$$

If CEO skill generality is positively related to better performance and reduced risk in Models 5 to 8 and director skill generality are positively related to better performance and reduced risk in Models 9 to 12, CEO skill generality and director skill generality are substitutional, implying a trade-off between skill specialists and skill generalists. In contrast, if CEO skill generality is complementary to director skill generality, firms with higher skill-generality CEOs prefer to appoint generalists directors; if boards are composed of specialist directors, they will nominate and appoint specialist CEOs in the same fields. To examine the complementary effect, Models 5 to 8 also examine a subsample in which all dimensions of director skills are in the high 30% grouping for director education, expertise, or experienc (H/L, M/L, and L/L). Similarly, Models 9 to 12 examine a subsample in which all dimensions of CEO skill generality are in the high 30% grouping for CEO education, expertise, or experience (H/H, M/H, and L/H).

Table 4: Effect of CEO Skills on Performance and Risk with Subsample of higher Director Generality

Panel A

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EDU	0.03***	0.53*	0.03*	-0.49**				
	(3.22)	(1.91)	(1.33)	(-2.94)				
PRO					0.21	0.45	0.07	2.30
					(0.70)	(1.10)	(0.95)	(1.48)
fsize	0.24	0.11	0.23	0.81	0.27*	0.04	0.22	1.43
	(1.82)	(0.46)	(1.81)	(0.93)	(2.23)	(0.16)	(1.87)	(1.24)
lvrg	0.81**	-0.71	0.42*	-9.07	0.66**	-1.01	0.42*	-9.25*
	(2.95)	(-0.62)	(2.02)	(-1.90)	(2.57)	(-0.83)	(2.01)	(-2.08)
mbr	0.01	-0.03	0.01	4.11*	0.01	-0.03	0.01	4.56*
	(0.51)	(-1.21)	(1.23)	(-2.25)	(0.77)	(-1.24)	(1.04)	(-2.27)
tgbl	-1.01	2.13	-0.44	7.93	-1.26*	2.80*	-0.46	8.26
	(-1.54)	(1.58)	(-1.27)	(1.73)	(-2.06)	(2.48)	(-1.31)	(1.67)
prft	0.02	-0.02	0.01	0.07	0.02	-0.02	0.01	0.06
	(1.75)	(-0.72)	(1.23)	(1.08)	(1.91)	(-0.91)	(1.30)	(0.95)
bsize	-3.70**	-13.36	0.68	5.61*	-3.51*	-14.50	0.91	5.68*
	(-3.70)	(-1.61)	(0.58)	(2.31)	(-2.58)	(-1.82)	(0.82)	(2.27)
dual	0.20	-0.49	0.06	-0.15	0.22	-0.58	0.07	-0.33
	(1.27)	(-1.14)	(0.82)	(-0.23)	(1.43)	(-1.33)	(0.90)	(-0.57)
indp	0.97	2.34	0.89*	-0.65	1.06	1.94	0.88*	-1.03
	(1.38)	(1.60)	(2.12)	(-0.32)	(1.54)	(1.48)	(2.11)	(-0.51)
inst	0.00	0.00	0.00	0.05***	0.00	0.00	0.00	0.06***
	(1.70)	(0.21)	(1.21)	(3.98)	(1.93)	(0.01)	(1.16)	(3.60)
mngr	0.08	-0.27*	-0.06	-1.40	0.06	-0.19*	-0.06	-1.34
	(0.51)	(-2.57)	(-0.71)	(-1.34)	(0.36)	(-2.41)	(-0.73)	(-1.16)
blck	0.48	1.47**	0.40*	-1.09	0.51	1.51**	0.38*	-1.09
	(1.41)	(2.93)	(2.13)	(-1.46)	(1.49)	(2.98)	(2.01)	(-1.31)
devt	-0.08	-0.58	-0.29	4.86*	-0.19	-0.37	-0.24	5.81**
	(-0.13)	(-0.68)	(-0.93)	(2.57)	(-0.32)	(-0.48)	(-0.77)	(3.12)
constant	-0.58	-2.17**	-0.50	0.28	-0.58	-2.40***	-0.48	-0.10
	(-1.36)	(-3.22)	(-1.92)	(0.28)	(-1.35)	(-3.72)	(-1.83)	(-0.07)
N	119	113	127	133	119	113	127	133
R^2	0.316	0.290	0.358	0.556	0.332	0.291	0.361	0.575

Table 4 continues

Table 4 (*continued*)

Panel B

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EXP	0.02	1.49**	0.12**	-1.41				
	(0.41)	(2.76)	(2.78)	(-0.41)				
GEN					0.45***	3.16	0.59**	-1.66**
					(4.69)	(1.13)	(3.06)	(-2.81)
fsize	0.23	0.17	0.23	0.90	0.24	0.08	0.23	0.83
	(1.82)	(0.69)	(1.84)	(0.85)	(1.81)	(0.31)	(1.93)	(0.90)
lvrg	0.79*	-0.91	0.42*	-8.88*	0.86*	-0.55	0.47*	-8.96*
	(2.92)	(-0.77)	(2.10)	(-1.96)	(2.92)	(-0.44)	(2.11)	(-1.99)
mbr	0.01	-0.02	0.01	4.30*	0.01	-0.02	0.01	4.15*
	(0.48)	(-0.78)	(1.22)	(-2.06)	(0.48)	(-0.86)	(1.19)	(-2.19)
tgbl	-1.04	2.21	-0.54	8.04	-1.06	2.77*	-0.47	8.07
	(-1.70)	(1.71)	(-1.33)	(1.76)	(-1.73)	(2.25)	(-1.38)	(1.77)
prft	0.02	-0.02	0.01	0.06	0.02	-0.03	0.01	0.06
	(1.81)	(-0.84)	(1.31)	(1.04)	(1.85)	(-1.33)	(1.61)	(1.08)
bsize	-3.83*	-13.39	0.90	6.06	-3.48***	-12.72	0.38	6.39**
	(-2.69)	(-1.66)	(0.79)	(0.37)	(-4.58)	(-1.49)	(0.37)	(3.38)
dual	0.21	-0.60	0.07	-0.18	0.20	-0.50	0.06	-0.18
	(1.34)	(-1.39)	(0.89)	(-0.31)	(1.28)	(-1.17)	(0.81)	(-0.31)
indp	0.98	2.20	0.92*	-1.64	1.03	1.78	0.96*	-0.98
	(1.43)	(1.57)	(2.19)	(-0.70)	(1.50)	(1.35)	(2.32)	(-0.48)
inst	0.00	-0.00	0.00	0.05**	0.00	-0.00	0.00	0.05***
	(1.60)	(-0.16)	(0.96)	(2.62)	(1.79)	(-0.36)	(1.51)	(3.50)
mngr	0.08	-0.24*	-0.07	-1.43	0.07	-0.08*	-0.08	-1.35
	(0.49)	(-2.52)	(-0.79)	(-1.42)	(0.44)	(-2.16)	(-0.94)	(-1.29)
blck	0.48	1.61**	0.40*	-1.41	0.49	1.43**	0.41*	-1.08
	(1.38)	(3.02)	(2.06)	(-1.06)	(1.45)	(2.66)	(2.23)	(-1.39)
devt	-0.08	-0.70	-0.30	5.46*	-0.11	-0.25	-0.32	4.99**
	(-0.13)	(-0.88)	(-1.01)	(2.45)	(-0.19)	(-0.33)	(-1.06)	(2.73)
constant	-0.57	-2.31**	-0.47	0.56	-0.58	-2.31**	-0.49	0.18
	(-1.32)	(-3.41)	(-1.81)	(0.31)	(-1.36)	(-3.36)	(-1.95)	(0.15)
N	119	113	127	133	119	113	127	131
R^2	0.316	0.322	0.361	0.559	0.321	0.318	0.377	0.552

Notes: The models are estimated by OLS with robust standard errors clustered at the level of acquirer banks. t-statistics are reported in parentheses. Symbols ***, ** and * indicate significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 5: Effect of Director Skills on Performance and Risk with Subsample of higher CEO Generality

Panel A

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EDU	0.21***	0.05	0.15*	1.92**				
	(3.11)	(0.07)	(-2.50)	(-3.03)				
PRO					0.18	0.15	0.02	-0.96
					(-1.28)	(0.28)	(0.74)	(-0.81)
fsize	0.24	0.11	0.23	0.64	0.24	0.10	0.23	1.13
	(1.86)	(0.45)	(1.87)	(0.66)	(1.98)	(0.38)	(1.82)	(1.14)
lvrg	0.94*	-0.97	0.49*	-8.38	0.65*	-1.05	0.42*	-9.55
	(2.18)	(-0.85)	(2.30)	(-1.89)	(2.52)	(-0.89)	(2.07)	(-1.85)
mbr	0.01	-0.02	0.01	3.88*	0.00	-0.02	0.01	4.29*
	(0.67)	(-0.90)	(1.39)	(1.99)	(0.24)	(-0.76)	(1.16)	(2.31)
tgbl	-0.84	2.67*	-0.42	7.47	-1.22	2.78*	-0.43	8.29
	(-1.30)	(2.02)	(-1.16)	(1.74)	(-1.93)	(2.29)	(-1.26)	(1.69)
prft	0.01	-0.02	0.01	0.07	0.02	-0.02	0.01	0.06
	(1.70)	(-0.89)	(1.20)	(1.03)	(1.95)	(-0.94)	(1.22)	(0.98)
bsize	-3.31**	-15.40	0.41	2.12*	-3.70*	-15.36	0.78	7.74*
	(-3.49)	(-1.86)	(0.36)	(2.38)	(-1.69)	(-1.90)	(0.70)	(2.47)
dual	0.17	-0.54	0.04	0.04	0.23	-0.57	0.07	-0.28
	(1.06)	(-1.24)	(0.55)	(0.07)	(1.46)	(-1.26)	(0.90)	(-0.46)
indp	0.87	2.02	0.84*	-0.52	1.01	1.97	0.90*	-1.27
	(1.29)	(1.38)	(2.06)	(-0.24)	(1.43)	(1.47)	(2.14)	(-0.64)
inst	0.00	0.00	0.00	0.05**	0.00	0.00	0.00	0.05***
	(1.60)	(0.06)	(1.16)	(2.93)	(1.79)	(0.03)	(1.27)	(4.32)
mngr	0.10	-0.20*	-0.05	-1.52	0.06	-0.19*	-0.07	-1.35
	(0.62)	(-2.41)	(-0.57)	(-1.23)	(0.40)	(-2.39)	(-0.74)	(-1.24)
blck	0.48	1.49**	0.39*	-1.49	0.49	1.49**	0.39*	-1.25
	(1.46)	(2.83)	(2.15)	(-1.36)	(1.39)	(2.87)	(2.09)	(-1.71)
devt	-0.05	-0.44	-0.25	4.66*	-0.12	-0.42	-0.27	5.80**
	(-0.09)	(-0.52)	(-0.84)	(2.55)	(-0.19)	(-0.53)	(-0.89)	(2.87)
constant	-0.60	-2.33**	-0.50	1.09	-0.58	-2.35***	-0.48	0.10
	(-1.44)	(-3.32)	(-1.99)	(0.64)	(-1.30)	(-3.54)	(-1.87)	(0.07)
N	119	113	127	107	119	113	127	133
R^2	0.326	0.279	0.369	0.529	0.325	0.280	0.358	0.562

Table 5 continues

Table 5 (*continued*)

Panel B

	ROE	EPS	ZSCR	$\sigma(ROE)$	ROE	EPS	ZSCR	$\sigma(ROE)$
EXP	0.34	1.43*	0.03	-2.64				
	(1.17)	(2.09)	(0.17)	(-1.42)				
GEN					0.54*	2.39	0.25	0.14
					(1.86)	(1.08)	(0.92)	(2.86)
fsize	0.18	0.36	0.23	0.53	0.22	0.16	0.22	0.82
	(1.50)	(1.31)	(1.75)	(0.53)	(1.70)	(0.59)	(1.79)	(0.89)
lvrg	0.78	-0.87	0.41	-8.48**	0.85	-0.81	0.42	-8.97*
	(1.83)	(-0.74)	(1.97)	(-2.60)	(1.95)	(-0.65)	(1.96)	(-1.99)
mbr	0.01	-0.03	0.01	4.24*	0.01	-0.02	0.01	4.14*
	(0.69)	(-1.25)	(1.14)	(2.05)	(0.53)	(-0.99)	(1.22)	(2.19)
tgbl	-1.01	2.20	-0.44	8.76*	-1.06	2.69*	-0.45	8.05
	(-1.70)	(1.74)	(-1.28)	(2.21)	(-1.72)	(2.22)	(-1.32)	(1.77)
prft	0.01	-0.00	0.01	0.07	0.02	-0.03	0.01	0.06
	(1.52)	(-0.22)	(1.29)	(0.98)	(1.91)	(-1.20)	(1.41)	(1.09)
bsize	3.18	-12.60	0.81	-4.28	2.60	-9.04	0.27	-5.69
	(1.45)	(-1.62)	(0.72)	(-0.24)	(1.15)	(-1.00)	(0.26)	(-0.32)
dual	0.20	-0.49	0.07	0.30	0.20	-0.55	0.07	-0.19
	(1.34)	(-1.08)	(0.91)	(0.48)	(1.30)	(-1.28)	(0.92)	(-0.32)
indp	0.98	1.91	0.90*	-1.10	1.01	2.03	0.92*	-0.94
	(1.49)	(1.30)	(2.11)	(-0.54)	(1.48)	(1.56)	(2.19)	(-0.46)
inst	0.00*	-0.00	0.00	0.06***	0.00	-0.00	0.00	0.05***
	(2.10)	(-0.31)	(1.16)	(3.31)	(1.73)	(-0.10)	(1.30)	(3.43)
mngr	0.11	-0.39*	-0.07	-2.35	0.07	-0.14*	-0.07	-1.35
	(0.66)	(-2.80)	(-0.71)	(-1.48)	(0.47)	(-2.30)	(-0.80)	(-1.30)
blck	0.49	1.47**	0.39*	-1.28	0.49	1.48**	0.40*	-1.07
	(1.50)	(2.76)	(2.05)	(-1.80)	(1.45)	(2.82)	(2.16)	(-1.37)
devt	-0.18	-0.11	-0.28	6.19***	-0.10	-0.46	-0.29	4.96**
	(-0.30)	(-0.14)	(-0.87)	(4.16)	(-0.17)	(-0.59)	(-0.96)	(2.70)
constant	-0.61	-2.26**	-0.48	0.65	-0.59	-2.27**	-0.49	0.17
	(-1.47)	(-3.18)	(-1.83)	(0.51)	(-1.39)	(-3.40)	(-1.93)	(0.15)
N	119	113	127	133	119	113	127	130
R^2	0.334	0.329	0.358	0.575	0.326	0.310	0.362	0.551

Notes: The models are estimated by OLS with robust standard errors clustered at the level of acquirer banks. t-statistics are reported in parentheses. Symbols ***, ** and * indicate significance at the 0.01, 0.05 and 0.1 levels, respectively.

The results on the competing hypotheses that whether the skills of director and CEO are complementary or substitutional to improve firm performance are provided in Table 4 and 5. The evidence on Panel A of Table 4 and 5 shows that their expertise are complementary to contribute to firm performance and risk. However, in contrast, the educational background and experiences are substitutional to each other (Panel A and B of Table 4 and 5).

6. Conclusion

The policy reforms on disclosure of individual skills and the increasing number of studies focusing on individual attributes of CEOs and directors motivate this research to explore the role of skill generality and specialty in the boardroom. This line of literature shows that different skills provide variation in corporate outcomes. However, current empirical findings are inconsistent, and the question of whether the skill generality or skill specialty is beneficial to the firm is controversial.

Specifically, this research asks the following questions: (i) Are different dimensions of skills and skill generality beneficial to the firm? (ii) Is CEO skill generality complementary or substitutional to director skill generality in relation to better corporate performances and reduced risks? (iii) Do the complementary/substitutional effects of CEOs'/directors' skill generality on corporate outcomes change when firms face complex business?

Given the policy reforms imposed by the 2006 Regulation of disclosure on individual skills of each director and any nominee for board member, the data cover the period from 2006 to 2014 for Taiwan listed non-financial firms. We find that executives and board members with higher educational background and greater expertise and experiences contribute to higher performance and lower risks. In addition, we find that the expertise of CEO and directors and complementary to improve performance, while the educational background and prior experiences are substitutional between CEO and directors.

This research contributes to the literature in the following ways. First, instead of focusing on a single criterion, this study includes multiple criteria of individual skills: education

background, professional expertise, and prior experience. Second, the study examines the skills of both CEOs and directors, which allows for the investigation of the interaction between CEOs and directors. Third, this research resolves a controversy regarding what level of skills generality of CEOs and directors is beneficial by arguing that CEO and director skill generality can be complementary or substitutional to influence governance practices and corporate outcomes.

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