School of Accounting

Three Essays on CEO Characteristics and Corporate Financing Decisions

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Declaration

To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university.

Signature:----------
Date: 02 October, 2020

Authorship declaration and attrition statement

The candidate, Md Ariful Islam, has submitted this thesis for examination and given its structure of three essays, for both examination and clarity purposes, it is necessary to provide some details on the extent to which this thesis is the candidate's work and the extent to which the candidate's supervisors have contributed to its final form.

The candidate is solely responsible for all of the literature reviews and hypotheses development, and for all of the empirical analyses including descriptive statistics and the main, sensitivity and econometric outcomes. In addition, the candidate has also prepared all the results and discussions resulting from the analyses on his own, including writing the research design sections of the thesis.

As supervisors, we have assisted and guided the candidate in a broad sense in framing the motivation to the three essays, helping identify the types of analyses to be undertaken and making suggestions in relation to the contributions of the candidate's research. In addition, we have also provided suggestions in terms of the research design in the areas of the sample period to be investigated and the choice of variables to be used.

If we were to put a quantitative value on the split between the candidate's efforts in this thesis and the collective efforts of the supervisors, we would suggest a contribution of 80 per cent in the candidate's favour and 20 per cent for the collective efforts of the supervisors.

Candidate	Principal Supervisor	Co-Supervisor	Co-Supervisor
Md Ariful Islam	Nigar Sultana	Imran Haider	Harjinder Singh

Dedication

To my father whose love and blessing always with me, Mr. Abdur Razzak (late).

To my beloved mother Rupia Begum who sacrificed a lot to bring me here.

To my brother Md Rayhan Islam who is my ideal and the person who always motivates me.

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Abstract

This thesis examines three different but interrelated topics regarding Chief Executive Officer (CEO) characteristics, namely CEO power, CEO outsider, and corporate financing decisions, specifically corporate cash holdings and dividend policy. The global financial crisis and an increasing number of scandals in the corporate arena create an awareness for stringent governance structures. The new corporate governance structure brings increased diversity to the board and affects its monitoring mechanism. As such, the role of the CEO became the centre of debate in accounting and financing literature for the last two decades. The rationale behind this is that the CEO is the person who makes the ultimate decisions for the organization, including strategic, investment and financial decisions for the better performance of the organization. Additionally, the CEO is the sole person who is rewarded or punished for the success or failure associated with his/her decisions. Therefore, it brings forward the question, are CEO characteristics associated with different financial strategies? As such, this thesis examines two distinct but related CEO characteristics, namely CEO power and CEO outsider, and how these characteristics affect corporate cash holdings and dividend policy. The first topic explores the relationship between CEO power and corporate cash holdings. The second topic explores the relationship between CEO outsider and corporate cash holdings. Finally, the third topic explores the relationship between CEO power and dividend policy together with moderating role of internal and external monitoring mechanisms from an imputation tax environment. These three new topics are largely unexplored in the research literature. Particularly, this thesis contributes to the CEO literature and corporate finance literature in relation to these topics.

Chapter one of the thesis is the introduction. In this chapter, the rationale behind the thesis and the structure of the thesis is discussed. Additionally, this chapter also presents the summary results of all three studies and the contribution of the thesis to the literature.

Chapter two, titled “Do powerful CEOs adopt greater cash holdings?”, focuses on the relationship between CEO power and corporate cash holdings. By adopting principal component analysis, two CEO power indices are constructed from eight individual CEO power proxies. The results of this study suggest that a positive

association between the CEO power indices and corporate cash holdings indicate that powerful CEOs hold more cash. A number of additional tests are undertaken to corroborate the main results.

Chapter three, titled "Outsider CEOs and cash holdings: What's going on?", examines the association between outsider CEOs and the level of cash holdings. This study finds that outsider CEOs are negatively linked with cash reserves and it is postulated that, due to their external reputation, such outsider CEOs are better able to raise external financing and therefore choose to have lower cash reserves. Instead, this study finds that such outsider CEOs initially choose to invest surplus cash on capital expenditure projects when they first join a firm but when the CEOs are close to leaving, they tunnel cash surpluses from capital investment projects to increase dividend payments. The rationale behind this is that the departing outsider CEOs seeking an increase in their reward structure when leaving the firm.

Chapter four, titled "CEO power, dividend policy and monitoring: An imputation tax environment" examines the association between CEO power and dividend policy as well as the moderating role of internal and external monitoring mechanisms. The results of this study shows that the likelihood of a powerful CEO paying a dividend is positively and significantly related to the dividend payment decision but the relationship between CEO power and dividend payout ratio is negative among the dividend payee firms. However, the internal and external monitoring results show that the relationship between CEO power and the dividend payment decision is again positive when interacting with internal monitoring variables, i.e. blockholders, but the relationship between CEO power and dividend payout ratio turns to positive when interacting with internal monitoring variables, i.e. blockholders. However, external monitoring variables do not have any significant impact on the relationship between CEO power and dividend policy. Finally, the franking credit nature of a dividend intensifies powerful CEOs' dividend payment decision and reduces the dividend payout ratio.

Finally, chapter five concludes the thesis and suggests future research directions.

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List of abbreviations

AI	Asymmetric information
AR(1)	First-order autoregressive
ASX	Australian Securities Exchange
Austrade	Australian Trade and Investment Commission
CAPEX	Capital expenditure
CEO	Chief Executive Officer
CPS	CEO pay slice
DID	Difference-in-differences
DPR	Dividend payout ratio
EBITDA	Earnings before interest, tax, depreciation and amortization
FE	Fixed effect
FFM	Functional form misspecification
GDP	Gross domestic product
GFC	Global financial crisis
GLS	Generalized least squares
GMM	Generalized method of moments
IMF	International Monetary Fund
NPV	Net present value
OLS	Ordinary least squares
PCA	Principal component analysis
PSM	Propensity score matching
QR	Quantile regression
R&D	Research and development
RE	Random effect
ROA	Return on assets
ROE	Return on equity
SIRCA	Securities Industry Research Centre of Asia-Pacific
SQR	Simultaneous quantile regression
US	United States

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CHAPTER 1

Introduction

1.1 Background and motivation

Over the past three decades, CEO characteristics and the role of the CEO has drawn significant research interest in the field of accounting and finance (Farrell & Whidbee, 2003). CEO choice and selection is an important decision and represents a significant event for the smooth running of a firm (Kesner & Sebora, 1994). The organization's success largely depends on the right choice of CEO. Selection of the right CEO has drawn special attention in recent years because of the increasing competitiveness in the world marketplace (Lam, McGuinness, & Vieito, 2013; Schrand & Zechman, 2012). Perhaps as a consequence of recent events, researchers exhibit significant interest in finding the characteristics of the individuals occupying the CEO position. Particularly this includes the characteristics involved in making effective corporate financing decisions that positively affect the performance of the firm and increase the competitiveness in the marketplace (Herrmann & Datta, 2002).

One of the big puzzles in the field of both accounting and finance is to what extent the CEO of a firm actually makes a difference in the firm's success. As such, CEO selection becomes an interesting debate on whether CEO "matter" in formulating a strategy for the firm and making corporate financial decisions. Hannan and Freeman (1977) do not believe the manager can affect firm performance because manager conduct operations within organizational and environmental restrictions that may produce scope limitations. However, Hambrick and Mason (1984) and Tushman and Romanelli (2008) provide evidence that managerial leadership is one of the main factors that lead to an organization's success.

The CEO's role is considered as a source of power in the organization, and they are also considered to be the planner of the organization's strategic decision making and policy formulation (Adams, Almeida, & Ferreira, 2005; Lewellyn & Muller-Kahle, 2012; Sheikh, 2019). CEOs along with other members of the board of directors ultimately approve the investment and financial decisions of the organization. Therefore, the CEO's influence depends on how much power they enjoy in comparison to the board members and other top executives. So, CEOs capacity to influence the

financial decisions of the organization is reflected by the power exercising ability of the CEOs.

The research study by Bebchuk, Cremers, and Peyer (2011) provides empirical evidence that strong CEO power or dominance is related to lower firm value. Therefore, CEO power may affect firm performance and subsequently worsen the agency conflict. This study further reports that CEO dominance is an important variable that has numerous corporate outcomes. Moreover, the way in which powerful CEOs influence these corporate outcomes appears to be associated with agency cost. Prior literature (Caliskan & Doukas, 2015; Lewellyn & Muller-Kahle, 2012; Li, Lu, & Phillips, 2018; Onali, Galiakhmetova, Molyneux, & Torluccio, 2016) provides evidence that high CEO power enables CEOs to take decisions in such a way that gives benefit to rather then to the shareholders and subsequently exacerbate the agency conflict. However, Sheikh (2019) reports that powerful CEOs consider themselves as optimistic about the inherent benefits of their decision and have a tendency not to consider the impending risk associated with their decisions. This optimism can lead them to be overconfident about their knowledge and skills and subsequently poses a greater possibility of costly mistakes at the time of making investment decisions (Adams et al., 2005). Consequently, the possibility of experiencing extreme outcomes, which can be either beneficial or detrimental for the organization, and the variation of the performance is very high when CEOs enjoy increased power.

The CEO role is vital for an organization. As such, the corporate board of directors has two options available regarding CEO appointment. They can either recruit someone from outside the organization or promote someone from the inside. In both cases, there are some advantages and disadvantages. Outsider CEOs bring new knowledge, vast experience, an established external network, different skills and a novel perspective on how to run the organization and combat newer challenges. On the other hand, insider CEOs already have firm-specific knowledge, comprehensive knowledge on the firm's current policies and information on the skill set of the employees so that they can implement the policies at a lower cost. The article titled "The rise of the outsider CEO" by forbes.com highlights CEO succession statistics and shows that the appointment of outsider CEOs is experiencing a rising trend in recent years. The article also points out some reasons for this rising trend. First, discontinuing the existing policy is one of the reasons for an external CEO appointment. Second,

corporate governance structures have been changed due to the regulatory reforms that have taken place after 2000. Therefore, the corporate board has become more diversified and independent, and consequently, boards are expanding their horizons beyond the boundary of the company and looking for an external candidate for better performance and innovation.

Because of the corporate scandals e.g., Enron, WorldCom, Freddie Mac, HealthSouth and subsequent change in corporate governance structure, researchers have demonstrated significant interest in examining how outsider CEOs deal with the policy formulation and strategic decisions of the company (Jiang, Huang, & Kim, 2013; Karaevli & Zajac, 2012; Zhang & Rajagopalan, 2010). Jongjaroenkamol and Laux (2017) explain that looking for new CEOs beyond the boundaries of the organization is important because outsider CEOs bring new knowledge, innovative ideas and a novel perspective to the organization, and they are adaptive to the new and changing environment. However, outsider CEOs may be considered more risky than internal CEOs to the board because the corporate board may not have enough information regarding the strength and managerial capacities. Moreover, they do not have firm-specific knowledge (Jongjaroenkamol & Laux, 2017). Due to their wider networks and experience in different firms, outsider CEOs possess different leadership styles and skill sets, which can help initiate and implement policy change in alternative ways. Subsequently, Parrino (1997) advocates that poor performing firms prefer to recruit outsider CEOs because they are looking for a new direction, which outsider CEOs are assumed to bring, to magnify their performance.

Cash is the most liquid asset in any firm's balance sheet. Therefore, cash holdings become one of the most important areas of corporate financial policy where the CEO can influence policy formulation and ultimate decision taking (Ferreira & Vilela, 2004; Harford, Mansi, & Maxwell, 2008; Jiang & Lie, 2016; Opler, Pinkowitz, Stulz, & Williamson, 1999). Because of its liquid nature, cash holdings also attract significant attention from investors, stockholders, capital market analysts and corporate boards (Subramaniam, Tang, Yue, & Zhou, 2011). As such, cash attracts special attention both in economic affluence and in recession. In late 2007, at the time of the global recession, the major concern was the liquidity crisis, which had a long-term impact on most of the firms' operations in the affected economy. During a period of the liquidity crisis, firms maintaining surplus cash can avoid sourcing funds from

costly and scarce external debt markets (Subramaniam et al., 2011). On the other hand, at a time of economic affluence and expansion, CEOs need to decide whether to increase the buffer cash, spend the cash as a share repurchase or disburse the cash as a dividend, purchase capital goods, grasp new investment opportunities or use the cash for external acquisition (Harford et al., 2008). As such, corporate finance literature still continues the debate on the determinants of cash holdings. It is not still evident how CEOs choose between increasing cash reserves and disbursing or spending the surplus cash.

Most of the recent cash holdings literature examines CEO overconfidence and the value of cash holdings (Aktas, Louca, & Petmezas, 2019). Florackis and Sainani (2018) investigate chief financial officers' influence on corporate cash holdings. Jiang and Lie (2016) investigate how firms adjust their cash reserves when they have decreased from optimal levels. Kee H. Chung, Jang-Chul Kim, Young Sang Kim, and Hao Zhang (2015) examine information asymmetry and cash holdings. On the other hand, most CEO power-related studies investigate areas such as corporate risk, firm performance, pay parity, market competition and capital structure choice. Vo and Canil (2019) investigate whether managerial power or efficient contracting affect CEO pay disparity. Sheikh (2019) examines CEO power and its impact on idiosyncratic measures of risk by considering market competition and corporate governance. Chao, Hu, Munir, and Li (2017) examine CEO power and the corporate capital structure. Veprauskaitė and Adams (2013) investigate the effect of CEO power on firm performance. Chapter two of this thesis addresses this gap and investigates an overlooked but important relationship between CEO power and corporate cash holdings.

Cash holdings are considered an important source of funds necessary to meet the firm's investment need when scouting funds from external sources are costly or when the firm has limited access to other sources of funds. Similarly, it is argued that when the management of the firms assume difficulties in obtaining fund from external sources, they tend to stockpile more cash to reduce the uncertainty (Harford, 1999; Opler et al., 1999). Therefore, the adjustment of the cash to determine the optimal level of cash holdings creates a corporate financing decision dilemma for the manager or CEO: to invest or acquire capital goods or to disburse cash as a dividend (Harford, Mansi, & Maxwell, 2012). Consequently, as head of the organization, the CEO may

need to take the final decision among the alternatives, and how CEOs deal with the dilemma is still not clear. Zhang and Rajagopalan (2003) argue outsider CEOs appointment has a significant implication for firms' policy formulation because outsider CEOs are treated as a change maker and can implement the policy shifting strategy more swiftly than insider CEOs. As such, outsider CEOs may choose to accumulate cash or may reduce the cash balance by increasing the spending, which is still unexplored. As such, Chapter three of this thesis attempts to fill this gap in the literature by investigating an overlooked but important relationship between outsider CEOs and corporate cash holdings.

Dividend policy is one of the most important corporate financing decisions that an organization needs to take. Prior literature identifies several factors that affect corporate dividend policy, such as growth opportunity, tax rate, organizational structure, capital structure and financial flexibility (DeAngelo, DeAngelo, & Stulz, 2006; Jordan, Liu, & Wu, 2018; Twite, 2001). Exhaustive works have been done to decide how firms choose between investment and dividend payout (Oded, 2019). Oded (2019) further argues that the majority of the literature uses the signalling framework or taxes to explain how firms choose between these two alternatives, but the propensity to pay a dividend still remains the big "puzzle". Agency theory of free cash flows is commonly used in capital structure literature, but this theory is not commonly used in dividend payout literature (Oded, 2019). Similarly, Denis and Osobov (2008) find that clientele, catering and signalling theories are not a strong explanation for the propensity to pay a dividend, but they find support for the agency perspective of dividend payout. However, Jensen (1986) argues that dividend payment helps to alleviate agency conflict between the management of the firms and shareholders. When shareholder's active monitoring is absent, dividend payment can provide indirect control benefits, as explain by Rozeff (1982). However, in some firms, the CEO role is very important in making any final decision irrespective of the financial and strategy formulation, whereas in other firms, the decision is the outcome of top management's mutual agreement (Adams et al., 2005). If there are difficulties in reaching consensus decision, then the decision-making power flows to the person whose position is influential. As such, prior studies such as (Bertrand & Schoar, 2003; Frank & Goyal, 2009) explain that in an organization, the position of CEO is the most vital and influential. Therefore, it is assumed that the CEO position plays a significant

role in a firm's financial decision-making policy. However, there have been no studies until now that investigate the relationship between CEO power and dividend policy with a moderation effect of internal and external monitoring mechanisms. Therefore, Chapter four of this thesis attempts to fill this gap in the literature by exploring this relationship using agency theory from an imputation tax environment perspective.

1.2 Thesis structure and summary of findings

This design of this thesis is based on three essays. These three essays investigate three different but interrelated aspects of CEO characteristics, namely CEO power and CEO outsider, and corporate financial decisions, specifically cash holdings and dividend policy, using Australian data. All firms listed on the Australian Securities Exchange (ASX) for the observation period 2001 to 2015 are examined, excluding financial institutions, banks and insurance companies. As SIRCA started its coverage in 2001, this is considered the starting point of the data, and the latest data available in the database is collected from 2015. Overall, this thesis consists of five chapters including the introduction chapter. The main findings for Chapters two to four are presented below.

Chapter two presents the first essay of this thesis and investigates the relationship between CEO power and corporate cash holdings. CEO power is an important CEO characteristic as it has a substantial influence on corporate outcomes and the decision-making process. Although several studies examine the impact of CEO power on corporate governance characteristics, for example, firm characteristics, firm performance and risk-taking incentives, the relationship between CEO power and corporate cash holdings has not been examined. Moreover, powerful CEOs receive poor credit ratings and strong CEO power increases information asymmetry. Consequently, it becomes difficult for bondholders to monitor the powerful CEO's activities. As such, a powerful CEO may assume that access to the external fund may be limited as well as costly. In addition to this, because of the agency perspective, a powerful CEO may like higher flexibility and may choose to increase the cash holding reserve.

To test the relationship, two CEO power indices are constructed based on the sources of power identified by Finkelstein (1992) and Daily and Johnson (1997). This study includes eight different proxies in the construction of the CEO power indices so

that it can provide a comprehensive picture of CEO power. The empirical investigations indicate that all three different measures of cash holdings are positively and significantly associated with the two CEO power indices, meaning that powerful CEOs hold more cash than non-powerful CEOs. Results are consistent with all robustness analyses.

Chapter three presents the second essay of the thesis and investigates the relationship between outsider CEOs and cash holdings. Outsider CEOs are an important source of new CEO appointments. Due to the change in corporate governance structure, the number of independent directors has increased in corporate boards. Therefore, the outside directors are also looking for CEOs beyond the boundary of the firms because outsider CEOs bring innovative ideas, wider experience, new knowledge, established networks and a new leadership style. Therefore, outsider CEOs' experience and outside networks enable them to get easy access to the capital market for external funds at a time of necessity. Due to this competitive advantage, outsider CEOs may assume easy access to the external funds and thereby reduce the cash reserve for grasping investment opportunity.

In this study, a generalized least square (GLS) model has been used to test the relationship between outsider CEO and cash holdings. The empirical results of this study represent a strong negative relationship between outsider CEOs and cash holdings, indicating that firms with outsider CEOs hold lower cash. As standard regression models such as the GLS model focus on the central tendency of the distribution of the sample, the simultaneous quantile regression (SQR) model has been used in this study to capture the impact of the outsider CEO at the 10th, 25th, 50th, 75th and 90th quantiles of cash holdings. Outsider CEOs are consistently negatively associated at all quantiles except the 10th quantile. The coefficient of cash holdings increases consistently from lower to higher quantiles, indicating that the impact of outsider CEOs is significantly higher in firms with high cash holdings than in firms with low cash holdings. Subsequently, the outcome from the GLS and the SQR models triggers another question. Do outsider CEOs follow operational considerations of cash holdings or an agency perspective for cash adjustment or both? To investigate the relationship, the dependent variable was replaced by CAPEX and the regression was rerun, resulting in a strong positive relationship between outsider CEOs and CAPEX in year $t+1$. This means that outsider CEOs diminish the cash reserve after their

appointment but increase capital expenditure in the following year to grasp better investment opportunities. On the other hand, because of the agency perspective, the CEO may act differently in the long run when their next appointment is imminent. To examine the relationship, the CEO outsider variable is replaced with a dummy variable for outsider CEOs who stay with a firm for five years or more and the regression is rerun. The results show a significant positive association between outsider CEOs with equal to or more than five years' tenure and cash holdings and supports the prior literature of agency perspective.

According to the agency perspective, outsider CEOs' long-run behaviour change may be a trigger to secure their empire-building agenda because cash is the most liquid asset that top management may use to achieve personal benefits. Consequently, this study considers the tunnelling perspective introduced by Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000), who discuss that tunnelling refers to the transfer of resources from a company to its controlling shareholders, specifically the top management. Additionally, this study also considers CEOs' action in the long run with the likelihood that they may stockpile cash in order to gain or secure a personal benefit within the agency theory framework. Therefore, following Chen, Jian, and Xu (2009), dividends are used as the tool for tunnelling by outsider CEOs when they perceive their next appointment to be imminent. The new result presents a strong positive relationship between outsider CEOs with equal to or more than five years' tenure and dividend pay in year $t+5$, confirming the tunneling assumption under the principal-agent relationship.

Chapter four presents the third essay of the thesis and investigates the relationship between CEO power and dividend policy with moderation role of internal and external monitoring mechanisms from an imputation tax environment. CEOs play a vital role in the organization's policy formulation and corporate financial decision making. Additionally, this impact is heightened when the CEO is powerful because power is described as dissymmetric control over valued outcomes (Keltner, Gruenfeld, & Anderson, 2003; Magee & Galinsky, 2008). Approach-inhibition theory of power by Keltner et al. (2003) explains that power amplifies the activation of the behavioural approach system and leads the individual to be sensitive to rewarding probabilities. Consequently, powerful CEOs are those who can influence the vital decisions of the firm in spite of having probable opposition from other top executives and board

members. It is argued that a powerful CEO may choose to pay a dividend in order to pass a positive signal to the marketplace and to avoid monitoring from the external capital market but they may choose to lower the dividend payment from the dividend payee firm to achieve the flexibility needed to implement their personal agenda under agency theory.

The empirical results of this study show that the likelihood of a dividend payment is strongly positively associated with the CEO power index. Subsequently, this study investigates the relationship between the dividend payout ratio (DPR) with year *t* and one-year lag periods *t-1* and *t+1* and the CEO power index, and the results indicate a significant negative association, confirming the conjecture under the principal-agent relationship. Subsequently, to examine the impact of internal and external monitoring variables as a moderating variable on the CEO power index, the regression was run by interacting internal and external monitoring variables with the CEO power index. The results show that the dividend payment decision is still positive and significant when the CEO power index interacts with 5% Blockholder and the coefficient of DPR is significant, but this turns into positive from negative when the CEO power index interacts with 5% Blockholder. These results indicate that with the presence of strong internal monitoring mechanisms, dividend payout is increased, agency costs are reduced and shareholders' rights are protected. On the other hand, external monitoring variables such as institutional ownership do not have any impact on dividend policy when interacting with the CEO power index. Therefore, this study runs a partitioning test given the franked and unfranked dichotomy of the dividend and the results show that the relationship is stronger when the firms are offering a franking credit on the dividend.

Finally, Chapter five presents the overall conclusion of the thesis and the future research direction.

1.3 Contribution to the literature

This thesis examines three aspects of CEO characteristics and corporate financing decisions that have largely not been explored in the accounting and finance literature. The findings of these three essays contribute to the literature in the following ways.

Chapter two contributes to the CEO-based corporate finance literature by investigating the relationship between CEO power and corporate cash holdings. Existing literature (Bernile, Bhagwat, & Rau, 2017; Custódio & Metzger, 2014; Liu & Mauer, 2011; Liu, Mauer, & Zhang, 2014) investigates CEO characteristics in relation to corporate financing decisions by overlooking the relationship between CEO power and corporate cash holdings, although the existing literature (Adams et al., 2005; Bertrand & Schoar, 2003; Florackis & Sainani, 2018; Malmendier & Tate, 2005; Veprauskaitė & Adams, 2013) clearly shows that CEOs are the most influential people in financing decisions. As such, this study also helps to bridge the gap between behavioural finance and corporate financing decisions. In this study, to get a comprehensive picture of CEO power, two CEO power indices are developed by considering eight different power proxies to better capture the CEO power indices identified by Finkelstein (1992) and Daily and Johnson (1997) and therefore this study provides a methodological contribution.

Chapter three of this thesis extends the CEO-based corporate finance literature by investigating how outsider CEOs manage cash holdings during their tenure at a firm. This study shows, in the first instance, outsider CEOs choose to maintain lower cash reserves because of the outsider CEOs' existing external networks and easy access to the external capital market. Interestingly, outsider CEOs in the year after their appointment increase the capital expenditure, and in the later years of their appointment they bring the cash back to tunnel the cash as a dividend payment, confirming the agency theory perspective. Therefore, these findings provide relevant insight to the board of directors when making CEO appointment decisions. Finally, this study also contributes to the debate on the merits of insider and outsider CEO appointment decisions and the literature on the life cycle of a CEO. This study makes a methodological contribution by combining both GLS and SQR estimators to examine the relationship between outsider CEOs and cash holdings, thereby not only focusing on the conditional mean function but also scrutinizing the relationship at different levels of cash holding distributions, making the results and conclusions more robust than prior studies.

Chapter four extends the CEO-based corporate finance literature by providing empirical evidence that a powerful CEO has a significant impact on corporate dividend policy, and that internal monitoring mechanisms restrict the behaviour of the CEO and

therefore protect the shareholders' interest. This study also contributes to the CEO-based dividend literature debate from the monitoring perspective by considering the classical and imputation tax environments. Additionally, this study also contributes to the debate as to whether the CEO matters in the corporate decision-making process and provides evidence that a powerful CEO does influence corporate dividend policy. Finally, this study contributes to the agency theory-based CEO literature (Easterbrook, 1984; Hu & Kumar, 2004; Jensen, 1986; Korkeamäki et al., 2017; La Porta et al., 2000; Sharma, 2011) and provides evidence that internal monitoring mechanisms reduce the agency conflict between the shareholder and the management of the firm.

CHAPTER 2

Do powerful CEOs adopt greater cash holdings?*

2.1 Introduction

In July 2018, Australian council of superannuation investors released the report of CEO salaries for the ASX200 companies in 2017. This report shows that the top highly paid CEOs in 2017 as being Don Meij (Domino's Pizza Enterprises), Peter & Steven Lowy (Westfield Corporation), Nicholas Moore (Macquarie Group), Chris Rex (Ramsay Health Care) and Louis Gries (James Hardie Industries) (Australian Council of Superannuation Investors, 2018, July 17). Their annual earnings are $36.84 million, $25.91 million, $25.19 million, $22.31 million and $18.03 million respectively making them the most powerful CEOs in Australia. Likewise, the cash and cash equivalent reserves of these above-mentioned companies also fall in the top 10th percentile among the listed firms under Australian Securities Exchange (ASX) in 2017. These statistics trigger an unexplored research question: Do powerful CEOs hold more cash or not?

One of the important components of the balance sheet which attracts substantial attention from shareholders, investors, capital market analysts, and boards is cash holding. Cash holding is important for economic prosperity and especially for economic recession and consequently resilience (Campello, Giambona, Graham, & Harvey, 2011). As a result, corporate cash holdings draw significant research attention (Aktas et al., 2019; Harford, 1999; Jensen, 1986; Subramaniam et al., 2011).

The global financial crisis of 2008, by highlighting the dangers of a liquidity crisis, reestablished the importance of maintaining optimal levels of cash holdings, which can shield a company in both economic prosperity and economic recession. Consequently, companies may seek a management team headed by a CEO who will work in the best interests of the company instead of personal wealth-building (Florackis & Sainani, 2018). Considering the importance of CEOs in organizations,

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CEO characteristics have attracted significant research attention in accounting and finance over the last several decades (Chikh & Filbien, 2011; Faccio, Marchica, & Mura, 2016; Farrell & Whidbee, 2003; Kaplan, Klebanov, & Sorensen, 2012). The selection of a CEO is a critical decision and represents an important event in the operations of a firm (Kesner & Sebora, 1994). One of the keys to the success of a firm depends on the correct selection of a CEO. Due to the increasing competitiveness in the world marketplace, the selection of the right CEO has received special attention in recent years (Lam et al., 2013; Schrand & Zechman, 2012). Perhaps as a consequence of this, researchers have a significant interest in identifying the characteristics of individuals occupying CEO positions best suited to making effective corporate financing decisions, affecting the performance of the firm positively and increasing its competitiveness in the marketplace in general (Herrmann & Datta, 2002).

The approach inhibition theory of power by Keltner et al. (2003) indicates that power augments the activation of the behavioral approach system and results in individuals being sensitive to rewarding probabilities. A number of scholars support this theory and add that people become more sensitive to positive and awarding information after acquiring power (Anderson & Galinsky, 2006) and express themselves by making decisions with greater autonomy (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008). Based on the former, Fast, Sivanathan, Mayer, and Galinsky (2012) describe a sense of power as leading individuals so as to be overconfident in their decision-making accuracy and ability. For example, CEOs always choose projects that generate the maximum value under a principal–agent framework as a result of the different types of agency concerns.[1] Theoretically, for such CEOs, any model of the firm is an approximation, and the main concern of this approximation ignores management and assumes investment as the first priority (Pan, Wang, & Weisbach, 2013). Consequently, this position brings two questions to mind. First, if the CEO or top management affects a firm's behavior, is this the result of an

[1] In the principal–agent literature, CEOs are negatively framed as exerting minimum effort only and accused of underinvesting or overinvesting and being interested in enjoying the quiet life. Furthermore, CEOs are willing to invest in those projects that maximize their own human capital and cause delays in recognizing mistakes. They are also interested in building empires that escalate their own utility rather than the value of the firm and so on. See Bertrand and Mullainathan (2003); Jensen and Murphy (1990), and Bebchuk and Fried (2006) for a more complete discussion.

agency problem or a problem regarding the efficient allocation of the firm's resources? Second, what will be the way to determine the quantitative significance of the CEO to the understanding of corporate financing decisions? According to Pan et al. (2013), one technique to measure CEOs' influence on firms' investment activities is to estimate the firms' different financing activities over the duration of CEO tenure.

Most of the recent cash holdings literature examines chief financial officers' influence on corporate cash holdings (Florackis & Sainani, 2018). Jiang and Lie (2016) investigate how firms adjust their cash reserves when these have decreased from optimal levels, Liu et al. (2014) focus on firms' cash holdings in relation to CEO inside debt, Steijvers and Niskanen (2013) investigate the determinants of cash holdings in private firms, and Subramaniam et al. (2011) study firm structure and cash holdings. On the other hand, most CEO power-related studies investigate firm performance, market competition, risk and capital structure choice, and so on. Huang, Jain, and Shao (2017) investigate CEO power and product market competition, Chao et al. (2017) examine CEO power and the corporate capital structure, study CEO pay parity, Vo and Canil (2019) and Chen (2014) focuses on board capital and R&D investment with the moderating effect of CEO power, and Veprauskaitė and Adams (2013) investigate the effect of CEO power on firm performance.

Our paper investigates an overlooked but important relationship between CEO power and corporate cash holdings. The degree of CEO influence can direct firm performance in either positive or negative ways, as extreme decisions can be taken when CEOs are more powerful. Powerful CEOs seek to influence other top executives and sometimes board members (Adams et al., 2005). Such CEOs are also found to be less likely to compromise, which results in more extreme decisions that are either very effective or detrimental to the firm. Consequently, it can be envisaged that powerful CEOs are those who can regularly influence crucial decisions in their firms despite facing opposition within the firm. The levels of corporate cash holdings is one such crucial decision.

We empirically examine the relationship between CEO power and corporate cash holdings using a sample of 9,708 Australian firm-year observations from 2001 through to 2015. Although some studies have examined CEO power in the US, little is known about the impact of CEO power in a low regulation and less litigious country

such as Australia. Khurana and Raman (2004) suggest that less regulated settings better reveal the consequences of voluntary choices in managerial decision making. In these settings, managerial choices are based more on the potential liquidity outcomes through the choice of more powerful CEOs. As a result, such liquidity outcomes are less likely to be affected by external pressures such as threats of litigation and the regulatory environment. In addition, evidence from Australia is more applicable to other important markets such the US, United Kingdom and the European Union given similarities in their investor protection regimes, bigger capital markets, demand for independent audit services and similar financial reporting practices (Ali & Hwang, 2000; Bhattacharya, Daouk, & Welker, 2003; Hung, 2001). Finally, Australia has one of the most robust and resilient economies with a significant impact on the world economy (Australian Trade Commission, 2019, January). The Australian Trade and Investment Commission's (Austrade) Benchmark Report 2019 indicates that Australia is the only major country among developed nations to have faced no recession from 1992 to 2018. The Australian financial system is also largely service-based with such service sectors constituting the largest part of the Australian economy, accounting for 75% of employment and 70% of the GDP. This has implications for our research setting as service-based economies deal with higher levels of cash liquidity. Consequently, Australia provides an appropriate setting to examine the influence of powerful CEOs on cash holdings.

The construction of CEO power indices is also one of the key features of this study. Considering the sources of power identified by Finkelstein (1992) and Daily and Johnson (1997), we include eight different proxies for CEO power, some of which have not been used by more recent studies (Chao et al., 2017; Veprauskaitė & Adams, 2013), resulting in indices that comprehensively capture the multidimensional aspect of CEO power (see Section 3.3.2). We construct two power indices based on CEO decision-making autonomy and remuneration.

Our empirical investigation results in several important findings. After including three different measures of cash holdings, we find a significant positive association between both CEO power indices and corporate cash holdings, indicating that powerful CEOs hold more cash than non-powerful CEOs. We also use alternative measures of cash holdings to verify our results and find consistent results. Furthermore, we lag our dependent variable and find no change to our results, and

interact our independent variable with the global financial crisis (GFC) to assess whether the GFC affected our results. We find that powerful CEOs hold more cash in the GFC period than in the non-GFC period. To determine the robustness of our results, we also use alternative control variables and obtain quantitatively similar results.

We also employ four econometric tests to address the potential endogeneity concerns. Specifically, we seek to confirm that the results from our main model are not biased due to endogeneity. We identify several endogeneity concerns and to alleviate these concerns, we use a number of econometric techniques, namely propensity score matching (PSM), difference-in-differences (DID), two-stage system generalized method of moments (GMM), and two-stage least squares (2SLS) (see Section 6 for details). After implementing a battery of econometric techniques, we find that the overall results confirm the findings of our main model that there is a positive association between both CEO power indices and corporate cash holdings, indicating that powerful CEOs hold more cash.

We identify two possible reasons for our results. First, Opler et al. (1999) explain that firms prefer to hold more cash to save transaction costs, which are incurred when raising external funds, and, as an alternative, firms can use their own funds to finance their investments when the cost of debt is high or external funding is not available. In another study, Liu and Jiraporn (2010) find that dominant CEOs, as a result of agency conflicts, receive lower credit ratings. As a result, sourcing external funds at a time of necessity becomes difficult and expensive for these powerful CEOs. Second, due to the effect of agency theory, managers do not want to reserve cash at high levels, which maximizes the shareholder wealth (Opler et al., 1999). Instead, managers prefer flexibility and wish to reduce the risk of scarce cash in times of necessity to achieve their personal objectives, thereby holding onto greater cash reserves.

Our paper makes several contributions. First, our empirical investigation contributes to the CEO and cash holdings-related emerging literature documenting the fact that powerful CEOs control the corporate cash holdings decisions of firms. Second, most of the existing literature (Bernile et al., 2017; Custódio & Metzger, 2014; Liu & Mauer, 2011; Liu et al., 2014) examining CEO personal traits in relation to corporate financing decisions overlook the relationship between CEO power and

corporate cash holdings, although the existing literature (Adams et al., 2005; Bertrand & Schoar, 2003; Florackis & Sainani, 2018; Malmendier & Tate, 2005; Veprauskaitė & Adams, 2013) clearly shows that CEOs are the most influential persons in financing decisions. We also make a methodological contribution by developing indices that better capture the CEO power indices identified by Finkelstein (1992) and Daily and Johnson (1997) that influence corporate financing decisions, such as cash holdings. As such, this study also helps to bridge the gap between behavioral finance and corporate financing decisions. Furthermore, we consider agency theory in detail when explaining the relationship between CEO power and corporate cash holdings. Practically, the implications of our results provide important insights for firms' hiring CEOs based on their existing cash holdings policy. The outcomes from this study can also be a source of information to formulate new legislation to strengthen CEO-based corporate governance structures.

The remainder of the paper proceeds as follows. Section 2 describes the related literature. Section 3 provides an insight into the sample collection and the construction of the variables. Section 4 reports the empirical results. Section 5 provides more evidence and an explanation for our main findings. Section 6 concludes the study.

2.2 Literature review

2.2.1 CEO power

The corporate governance literature on CEO power indicates that the decision-making power of a firm is mainly concentrated in the CEO (Jiraporn, Chintrakarn, and Liu 2012). The concept of power has multiple dimensions, some of which are difficult to observe and, consequently, operationalize. Finkelstein (1992) distinguishes four different sources of power: ownership power, prestige power, structural power, and expert power. Similarly, Daily and Johnson (1997) identify different forms of CEO power, such as CEO duality, CEO ownership, CEO tenure, or the independent/interdependent composition distinction. Kor (2006) discusses power from two perspectives. From the perspective of agency theory, strong CEO power may inhibit board involvement in strategic decision-making by concealing critical information and weakening boards' monitoring decision-making agenda. On the other hand, strong CEO power may dominate meetings by controlling the decision-making

agenda, subsequently minimizing the potential conflict and strengthening the chain of command of the firm, facilitating rapid decision-making (Combs, Ketchen, Perryman, & Donahue, 2007). The most commonly cited type of power in the literature is structural power, which is based on organizational structure and hierarchical authority (Hambrick, 1981). Top executive officers generally make the decisions of the firm. According to the agency theory-based corporate governance literature, researchers develop their agenda based on the allocation of power between the board of directors and the CEO, which determines whose interests are likely to be investigated (Finkelstein, Hambrick, & Cannella, 2009; Lane, Cannella, & Lubatkin, 1998). In our study, we focus on the significance of CEOs' psychological processes and their influence on firm-level decision-making (Chatterjee & Hambrick, 2007; Li & Tang, 2010). We examine this particularly in a corporate decision-making setting and utilize the benefits of widely established knowledge of the CEO role and recent improvements to the social psychology research outcomes concerning how power affects psychological processes.

CEO power seems to aggravate agency costs and has a negative influence on corporate performance outcomes (Jiraporn et al. 2012). Bebchuk, Cremers, and Peyer (2011) state that strong CEO power is related to poorer accounting profitability, which eventually worsens the firm value as measured by Tobin's Q. Furthermore, they report that powerful CEOs are more interested in making imprudent acquisition decision that endangers the firm value, as measured by the market reaction to the acquisition announcement. The empirical evidence from Bebchuk, Cremers, and Peyer (2011) demonstrates that CEO dominance is one of the main variables that influence corporate outcomes significantly. It is particularly evident that powerful CEOs indulge in empire building and forgoing the shareholders' interest, hence increasing the agency conflict (Bebchuk, Cremers, and Peyer 2011). In a similar setting, Liu and Jiraporn (2010) find that bondholders view CEO power as a prime determining factor of the cost of firm debt. Furthermore, a firm with a powerful CEO experiences poor credit ratings and strong CEO power increases information asymmetry, making it very difficult for bondholders to monitor CEOs' actions.

CEO power is a critical CEO characteristic and has a substantial impact on corporate outcomes and decision-making processes. Although a number of studies investigate the impact of CEO power on corporate governance characteristics, firm

characteristics, firm performance, and risk-taking incentives, the relationship between CEO power and corporate cash holdings has not been examined.

2.2.2 Cash holdings

One of the important areas of corporate financing decisions is the optimum allocation of internal funds, and such decisions can lead to conflict between shareholders and top management (Jensen 1986). Increasing cash reserves is a common practice in times of economic prosperity and leaves CEOs in corporate financing dilemmas concerning whether to spend such reserves internally or disburse the cash to shareholders in the form of dividends (Harford et al. 2012). Additionally, CEOs trade off their personal advantages of current cash outlays against the elasticity provided by stockpiling surplus cash reserves. Before making any final decisions, CEOs must weigh the possible return either from visibly amassing excess cash or from additional spending (Harford et al. 2012).

Tong (2010) reports that cash holding can be treated both as a form of investment and as a source of financing decisions. Two characteristics of cash holdings from an investment viewpoint are identified by Opler et al. (1999). First, cash holdings are less risky and, second, cash holdings have negative net present value because interest from cash holdings is subject to double taxation. Dittmar and Mahrt-Smith (2007) recognize that the optimum levels of cash holdings are fixed by the prevailing shareholder protection law in different countries and explain that even firms operating within a low shareholder protection law cannot force CEOs to disregard the importance of holding cash consistent with the free cash flow hypothesis. On the other hand, Mikkelson and Partch (2003) demonstrate that continuous higher cash holdings of a firm do not result in a lower operating performance, and their results do not support the free cash flow hypothesis.

Recent studies in accounting and finance establish a link between CEO entrenchment and cash holding adjustments of firms. Jiang and Lie (2016) explain that it is difficult and costly to run businesses if the cash reserves are at a suboptimal level rather than having excess levels of cash. Scarcity of cash triggers managers to take quick action to reduce the shortfall rather than the opposite scenario. Managers also become anxious if the cash balances are low for firms with high leverage ratios or for firms with fewer or no rated borrowings. In this situation, managers take quick

remedial action to increase the cash reserves. Dittmar and Duchin (2016) investigate the influence of CEOs' previous experience on firms' debt and cash policies. In that study, the cash reserves and the value of cash holdings vary depending on determinants such as corporate governance mechanisms, corporate financial status constraints, and the existing laws to safeguard shareholders' rights. However, no attention is paid to determining whether CEO power has an influence on cash holding decision-making in the light of agency theory. Therefore, we focus on examining the relationship between CEO power and corporate cash holdings.

Pfeffer (1992) explains that powerful CEOs are those who can persistently influence key decisions in their firms despite facing different opinions from other top executives. Opler et al. (1999) document that, due to agency theory, managers do not want to hold cash reserves at levels that maximize the shareholder wealth. Additionally, managers wish to increase their flexibility and reduce the risks to achieve their personal objectives. Such motives may therefore lead managers to hold more cash than required. Consequently, this introduces a research question regarding whether powerful CEOs hold greater amounts of cash than necessary.

Liu and Jiraporn (2010) find a positive relationship between CEO power and new debt costs. This result suggests that bondholders expect a higher return from firms with powerful CEOs because they view such powerful CEOs as risky for their investment. Liu and Jiraporn (2010) further investigate dominant CEOs' influence on firms' credit rating and find that powerful CEOs experience lower credit ratings due to agency conflicts and, consequently, access to external sources of funds, like the bond market, becomes difficult and expensive for these powerful CEOs. Consequently, we argue that, due to such difficulties and the higher cost of external funding, powerful CEOs may keep higher cash reserves, leading to potential misalignment with firms that have different optimal levels of cash holdings.

Jiang and Lie (2016) find that managers are reluctant to reduce their firm's cash ratio if it has higher levels of cash, because those managers pursue their own self-interest and will be reluctant to disburse or invest excess cash in a timely manner. Several studies on CEO power (Chao et al., 2017; Daily & Johnson, 1997; Lewellyn & Muller-Kahle, 2012; Liu & Jiraporn, 2010) state that, due to agency conflicts, powerful CEOs work in their own self-interest rather than toward wealth maximization for shareholders, suggesting that, in our case, powerful CEOs may stockpile cash rather than investing or disbursing it in a timely manner. In another instance, powerful CEOs prefer financial flexibility and liberty to capital market discipline. Therefore,

when a firm produces surplus cash flows, such CEOs prefer not to invest them all but rather increase the cash reserve by stockpiling some of the cash.

2.3 Sample collection and construction of variables

2.3.1 Data sources

We collect data primarily from two sources. All corporate governance data, such as board and CEO characteristics and data related to CEO power indices, are collected from the Securities Industry Research Centre of Asia-Pacific (SIRCA). Data related to the dependent variables and all other financial data related to control variables are obtained from Morning Star (DatAnalysis). Following La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2002) and Matsumoto (2002), this study excludes financial intuitions, banks, and insurance companies due to their unique regulatory framework. We examine all firms listed on the ASX for the observation period 2001 to 2015. The reason for starting our sample in 2001 is that SIRCA started its coverage in 2001 and we collect the latest data available in the database until 2015. After excluding duplicate observations, observations relating to financial and real estate industries, and firms with missing values, this study examines 9,708 firm-year observations and sample breakdown on the basis of year and industry is presented in Table 1. We perform winsorizing at the 1% and 99% levels, consistent with prior studies (Rajgopal, Shevlin, & Zamora, 2006), to remove the effect of outliers. Details of each variable used in the study are presented in Appendix A.

Table 1: Sample breakdown- year and industry wise

Year \ Industry	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrial	Information Technology	Material	Utilities	Total
2001	13	45	25	34	25	52	45	38	7	**284**
2002	10	41	18	34	23	48	37	105	5	**321**
2003	13	44	20	30	23	54	38	128	5	**355**
2004	29	96	31	68	62	107	70	193	10	**666**
2005	29	97	32	85	63	113	66	224	8	**717**
2006	31	102	29	93	69	120	66	226	6	**742**
2007	30	99	31	102	67	124	63	237	8	**761**
2008	33	96	31	104	70	130	67	256	10	**797**
2009	33	94	29	102	67	133	67	264	10	**799**
2010	31	88	29	104	66	133	63	260	11	**785**
2011	32	80	26	99	59	123	62	259	9	**749**
2012	30	81	26	95	58	117	57	248	11	**723**
2013	31	73	27	93	48	112	51	232	11	**678**
2014	34	71	26	87	56	104	55	225	10	**668**
2015	32	81	26	81	57	103	58	213	12	**663**
Total	**411**	**1188**	**406**	**1211**	**813**	**1573**	**865**	**3108**	**133**	**9708**

2.3.2 Model

In this study, we use pooled ordinary least squares (OLS) regression as well as OLS with cluster-robust standard errors to examine the relationship between cash holdings and CEO power. We use cluster-robust standard errors because these consider the heteroskedasticity in a model's unexplained variation. Therefore, if the magnitude of variation in the outcome variable is correlated with the independent variables, robust standard errors take this correlation into account. Furthermore, cluster-robust standard errors consider the heteroskedasticity across the cluster of observations. The OLS regression models used in this study are expressed as follows[2]:

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (1)$$

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ P\_INDEX\_2_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (2)$$

For our dependent variable, we use several different cash holding measures as proxies (see Section 3.3.1) and to calculate CEO power, our explanatory variable in this study, we use principal component analysis (PCA) to construct two CEO power indices, notated as *P_INDEX_1* and *P_INDEX_2* (see Section 3.3.2).

2.3.3 Variables

2.3.3.1 Cash holdings

Following the existing literature on cash holdings, this study uses three different proxies to measure the level of cash holdings. First, we measure cash holdings as the ratio of cash and marketable securities to total assets (Bates, Kahle, & Stulz, 2009; Lu & Wu, 2018; Opler et al., 1999; Tong, 2010). Following Bates et al. (2009) and Atif, Lui, and Huang (2019), we also measure cash holdings by deflating cash and marketable securities by net assets. We use net assets because a firm's future profitability is a function of its assets. Finally, we also use the ratio of cash to net assets to measure the cash holdings (K.H. Chung, J-C. Kim, Y.S. Kim, & H. Zhang, 2015).[3]

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[2] Variance Inflation Factor (VIF) tests has been conducted for all main and additional analyses to test for potential collinearity and no evidence of collinearity was observed.

[3] We also use the log of the ratio of cash to net assets as a robustness check. We obtain a similar result when using this alternative measure of cash holdings.

2.3.3.2 Construction of the CEO power indices

In the CEO power literature, researchers use different proxies to measure CEO power, because there are no commonly accepted measures of CEO power. However, most researchers consider the four sources of executive-level power identified by Finkelstein (1992) while measuring power. For example, researchers use CEO duality, CEO tenure, CEO ownership, CEO founder, CEO multiple ownership, and CEO compensation as proxies to measure CEO power (Adams et al., 2005; Bebchuk et al., 2011; Daily & Johnson, 1997; Han, Nanda, & Silveri, 2016; Huang et al., 2017). On the other hand, other researchers use these proxies in different combinations to construct their CEO power index (Chao et al., 2017; Han et al., 2016; Huang et al., 2017; Jiraporn, Chintrakarn, & Liu, 2012; Liu & Jiraporn, 2010; Morse, Nanda, & Seru, 2011; Veprauskaitė & Adams, 2013). No single study captures all the different dimensions of CEO power identified by Finkelstein (1992). Consequently, following Liu and Jiraporn (2010), Morse et al. (2011), Veprauskaitė and Adams (2013), and Chao et al. (2017), we construct two different CEO power indices (*P_INDEX_1* and *P_INDEX_2*) by using eight CEO power proxies related to structural power, ownership power, and expert power. All these CEO power proxies measure CEOs' decision-making capacity and influence on the board and other parts of the executive in an organization. We construct these two CEO power indices based on eight individual CEO power proxies in order to understand the magnitude by which a CEO exercises his/her influence on corporate cash policies. To construct *P_INDEX_1* and *P_INDEX_2*, we adopt principal component analysis (PCA), because PCA considers the total variance in the dataset and helps to reduce the number of variables from eight so that we capture most of the variance in the correlation matrix. Among the eight CEO power proxies, we create two groups based on CEO remuneration and decision-making autonomy. CEO duality, CEO tenure, CEO ownership, CEO founder, and CEO functional experience are captured by *P_INDEX_1* (Chao et al., 2017; Huang et al., 2017; Veprauskaitė & Adams, 2013). In addition, CEO bonus pay, CEO remuneration, and the compensation ratio (CompRatio) are captured by *P_INDEX_2* (Chao et al., 2017; Veprauskaitė & Adams, 2013). We provide details of each of these CEO power proxies in the following section.

CEO duality: A common practice in some organizations is for the CEO to serve jointly as a chairperson of the board of directors. This dual service of the CEO

is widely referred to as CEO duality. CEO duality may have a positive or negative effect on the firm. Proponents of CEO duality explain that this joint service of the CEO also indicates that CEOs have the authority to act on the final resolution of any decision made by the board (Chang & Sun, 2009), which eventually can enhance firm performance. On the other hand, CEO duality enables CEOs to weaken the role of the board of directors in corporate decision-making by effectively controlling judgments, affecting firm activities like financing decisions negatively (Dayton, 1984). In this study, CEO duality is a dummy variable equal to 1 if the CEO is also the chairman of board and 0 otherwise.

CEO tenure: CEOs' decision-making power largely rests on their length of tenure in firms. Chava, Kumar, and Warga (2010) argue that a longer-tenured CEO can influence the corporate management and board structure to escalate his/her power. Hermalin and Weisbach (1998) also explain that longer CEO tenure escalates CEO power, which subsequently influences the board structure of a firm by making recommendations on the selection of board members. CEOs can positively affect board decision-making by increasing the firm-related knowledge resulting from their tenure, consequently making better financing decisions (Brookman & Thistle, 2009). In this study, we measure CEO tenure as the total number of years for which a person has served as a CEO in a firm (Lewellyn & Muller-Kahle, 2012).

CEO ownership: CEOs' equity ownership motivates them to make decisions that maximize firm performance and therefore increase their economic benefit due to having equity ownership in the firm. Denis, Denis, and Sarin (1997) argue that CEOs' ownership increases their decision-making power in the board and acts as a safeguard against dismissal. This equity ownership also protects CEOs from excessive monitoring mechanisms from board members (Lewellyn & Muller-Kahle, 2012). Pathan (2009) suggests that CEOs with greater equity ownership are more powerful. Therefore, CEOs with large proportions of shareholdings can play a significant role in determining a firm's direction by being the most powerful decision maker in the firm. To measure CEO ownership power, we divide the total number of shares owned by the CEO by the firm's total number of outstanding shares.

CEO founder: To construct the CEO power indices, we also use the CEO founder status, because Lilienfeld-Toal and Ruenzi (2014) suggest that founder CEOs

are more powerful in the organization and hold greater discretionary power within it. Chao et al. (2017) also find that founder CEOs play an important role in financial decision-making processes. Consistent with the prior literature (Daily & Johnson, 1997; Finkelstein, 1992; Lilienfeld-Toal & Ruenzi, 2014), we include the CEO founder status because a founder CEO influences firm decision-making and has control over the board of directors as a result of having long-term relationships with its members. CEO founder is a dummy variable equal to 1 if the CEO is the founder and 0 otherwise. Following Lilienfeld-Toal and Ruenzi (2014), we consider the CEO as a founder if he/she was in the role of CEO at the time of incorporation or joined within one year after the firm's date of incorporation.

CEO functional experience: Functional experience is an important component of an individual's knowledge base. This cognitive trait provides CEOs with realistic knowledge of different functions within the organization, fostering their decision-making accuracy and therefore making them powerful. Daily and Johnson (1997) argue that, if a CEO has been exposed to different functional areas, he/she may develop relationships with people from different functional areas within and outside the organization. Subsequently, this relationship helps him/her to understand organizational problems better and thereby improve the efficiency of the organization (Finkelstein & Hambrick, 1996). Furthermore, CEOs can use their own network established through their functional experience to solve organization problems without asking for help from the board of directors within the same functional experience (Daily & Johnson, 1997). Due to the CEOs' own functional experience, their reliance on the board of directors decreases, eventually making them more powerful. In this study, we measure CEO functional experience using a dummy variable. If the CEO has any prior experience in any industry or function of an organization before acting as the CEO, a value equal to 1 is allocated and 0 otherwise.

Compensation ratio (CompRatio): CEO power is also measured in the form of CEO compensation (Chao et al., 2017; Daily & Johnson, 1997; Lewellyn & Muller-Kahle, 2012; Veprauskaitė & Adams, 2013). When a CEO receives a higher salary than the other executives of the firm, it suggests that he/she has a greater influence on the decision-making process of the organization. Bebchuk et al. (2011) argue that the compensation ratio demonstrates the CEO's relative position in the firm based on compensation. Therefore, it is a useful proxy to measure CEO power, as it provides a

picture of the CEO's relative importance in the top management. Following Daily and Johnson (1997) and slightly modifying Bebchuk et al. (2011), we measure the compensation ratio by the ratio of the CEO's total compensation to the total compensation of the top executive of the firm who receives the highest compensation after the CEO.[4] A higher compensation ratio indicates that the CEO holds relatively more power than other top executives in the firm.

CEO remuneration: In corporate governance, the annual remuneration received by the board of directors is also an important factor and has a direct connection with the firm's structural power (Florackis & Ozkan, 2009). Comparing the board of directors' annual remuneration with the CEOs' annual compensation provides a relative picture of the incumbent CEO's power compared with the board based on compensation. Agency theory assumes that a powerful CEO may influence the remuneration committee to approve liberal compensation packages that have little relation to the firm's performance (Boyd, 1995). In this study, we include another compensation proxy, namely the ratio of CEO annual total compensation (including salary, bonus, and other benefits) to the total annual compensation received by all directors other than the CEO (Veprauskaitė & Adams, 2013).

CEO bonus pay: For our third CEO compensation proxy, we include CEO bonus pay. In the compensation package of executives, there are variable parts other than the base salary. The most common of these is a bonus (an incremental payment based on individual performance) (Holthausen, Larcker, & Sloan, 1995). As bonuses largely depend on individual performance and firm performance, it is obvious that performing CEOs and therefore more powerful CEOs receive comparatively higher bonuses than their non-performing counterparts (Grinstein & Hribar, 2004). Following Veprauskaitė and Adams (2013), we measure CEO bonus pay using a dummy variable coded 1 if the CEO receives a performance-related bonus and 0 otherwise.

[4] Bebchuk et al. (2011) measure CEO compensation as the ratio of CEO compensation to the total compensation of the top five executives of the organization. In this study, we use the top executive to measure the compensation ratio, because we already include two other CEO compensation proxies to construct our second CEO power index (P_INDEX_2).

We construct our two CEO power indices by combining eight different dimensions of CEO power proxies identified by the prior literature (Chao et al., 2017; Daily & Johnson, 1997; Finkelstein, 1992; Veprauskaitė & Adams, 2013) and by adopting PCA to identify the commonality in our CEO power measures. In addition to this, by adopting PCA, we address the potential multicollinearity that may create problems when we run the regression model using several CEO power proxies concurrently.

Panel A of Table 2 outlines the results from the PCA for *P_INDEX_1*. The results show an eigenvalue of 1.61, which is more than 1 (one)[5], and the corresponding percentage of variation is 32.27%. This means that the principal component captures 32.27% of the total variance in our dataset. The results also indicate that all 5 (five) CEO power proxies contribute positively to *P_INDEX_1*, consistent with our expectations. Following Hermalin and Weisbach (1998), Veprauskaitė and Adams (2013), and Chao et al. (2017), we maintain that CEO duality, CEO tenure, CEO founder, CEO ownership, and CEO functional experience point towards a higher degree of decision-making power of the CEO. Consequently, a positive *P_INDEX_1* indicates higher decision-making power of the CEO. However, a negative *P_INDEX_1* indicates lower CEO decision-making power. Panel B of Table 2 reports the correlation matrix of the CEO power proxies used to construct *P_INDEX_1*. The results indicate a positive and highly significant ($p < 0.001$) correlation among all the variables. In addition to this, we perform the Bartlett test of sphericity (Bartlett, 1954) and the Kaiser–Meyer–Olkin test of appropriateness to validate our data reduction (Kaiser, 1974).

Panel C of Table 2 shows the Bartlett test results, and we find that the variables are not intercorrelated, suggesting that *P_INDEX_1* is acceptable. Multicollinearity problems are another consideration for excessively intercorrelated variables. Consequently, we run Kaiser–Meyer–Olkin statistics, whereby we find that the overall

[5] If the eigenvalue is greater than 1, it indicates that the newly constructed variable has more explanatory power over the variance than any of the original variables individually (Florackis & Sainani, 2018).

value for the test is 0.64, which is higher than the recommended 0.60 (Kaiser, 1974), justifying the use of PCA.

Table 2
Construction of the CEO power index (P_INDEX_1)
Panel A: Principal component analysis (PCA)

Principal component	Components	Component loadings
P_INDEX_1	CEO Duality	0.48
	CEO Tenure	0.53
	CEO Founder	0.54
	CEO Ownership	0.71
	CEO Functional Experience	0.55
Eigenvalue	1.61	
Proportion explained	32.27%	

Panel B: Correlation among CEO power proxies

	(1)	(2)	(3)	(4)	(5)
(1) CEO Duality	1.00				
(2) CEO Tenure	0.10***	1.00			
(3) CEO Founder	0.05***	0.13***	1.00		
(4) CEO Ownership	0.21***	0.18***	0.24***	1.00	
(5) CEO Functional Experience	0.11***	0.15***	0.12***	0.20***	1.00

Note: $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Panel C: Appropriateness of P_INDEX_1

Bartlett test of sphericity	H_0: CEO power proxies are not intercorrelated
KMO	0.64

Panel A in Table 2 presents the results from a principal component analysis (PCA) based on the following CEO power proxies which are mostly related to CEOs' decision-making autonomy: CEO duality, CEO tenure, CEO ownership, CEO founder, and CEO functional experience. Panel A in Table 2 represents the component loading, eigenvalue, and proportion of variance, which are explained by the first components. Panel B in Table 2 presents the coefficient of correlation among the five CEO power proxies related to their decision-making autonomy. Panel C in Table 2 demonstrates the result of the Bartlett test and the Kaiser–Meyer–Olkin test of appropriateness. Details of each variable used in the study are presented in Appendix A.

Panel A of Table 3 reports the results from PCA of *P_INDEX_2* and shows that principal component analysis captures 53.86% of the total variance in our dataset and the eigenvalue is 1.62, which is greater than 1. Following Boyd (1995) and Veprauskaitė and Adams (2013), we postulate that larger compensation ratios, CEO bonuses, and a larger proportion of CEO remuneration compared with board members' emoluments indicate that the CEO enjoys a higher level of decision-making autonomy in the firm. As expected, the PCA results also show that all three CEO power proxies related to CEO compensation contribute positively to *P_INDEX_2*. Therefore, a positive *P_INDEX_2* indicates higher decision-making power of the CEO and vice versa. Panel B of Table 3 shows the correlation matrix of CEO remuneration, compensation ratio, and CEO bonus pay. The results confirm the existence of positive and highly significant ($p < 0.001$) correlations among all the variables. We also perform the Bartlett test of sphericity (Bartlett, 1954) to ascertain the intercorrelation of the variables and the Kaiser–Meyer–Olkin test of appropriateness (Kaiser, 1974).

The Bartlett test result in Panel C of Table 3 also justifies the appropriateness of *P_INDEX_2*, since all the CEO power proxies related to CEO compensation are not intercorrelated. The multicollinearity problem is another consideration for excessively intercorrelated variables. Consequently, we run Kaiser–Meyer–Olkin statistics and find that the overall value for the test is 0.62, which is higher than the recommended 0.60 (Kaiser, 1974), also justifying the use of PCA.

Table 3
Construction of the CEO power index (P_INDEX_2)

Panel A: Principal component analysis (PCA)			
Principal component	**Components**		**Component loadings**
P_INDEX_2	CEO Remuneration		0.82
	CompRatio		0.80
	CEO Bonus Pay		0.55
Eigenvalue	1.62		
Proportion explained	53.86%		
Panel B: Correlation among CEO compensation proxies			
	(1)	(2)	(3)
(1) CEO Remuneration	1.00		
(2) CompRatio	0.47***	1.00	
(3) CEO Bonus Pay	0.23***	0.19***	1.00
Note: p < 0.05, ** p < 0.01, *** p < 0.001			
Panel C: Appropriateness of P_INDEX_2			
Bartlett test of sphericity	H_0: CEO compensation proxies are not intercorrelated		
KMO	0.62		

Panel A in Table 3 presents the results from a principal component analysis (PCA) based on the following CEO power proxies, which are mostly related to CEOs' remuneration: CEO remuneration, compensation ratio (CompRatio), and CEO bonus pay. Panel A in Table 3 represents the component loading, eigenvalue, and proportion of variance, which are explained by the first components. Panel B in Table 3 presents the coefficient of correlation among the three different measures of CEO compensation. These three measures are all related to CEOs' power and influence their ability to exercise decision-making power. Panel C in Table 3 shows the result of the Bartlett test and the Kaiser–Meyer–Olkin test of appropriateness. Details of each variable used in the study are presented in Appendix A.

Thus, having completed the steps above, we adopt PCA to construct our CEO power indices *P_INDEX_1* and *P_INDEX_2*.

2.3.3.3 Control variables

Control variables associated with CEO power and cash holdings are included to rule out alternative explanations for the influence of CEO power on corporate cash holdings decisions. For greater representation, several control variables are incorporated into our analyses as follows:

2.3.3.3.1 Corporate governance variables

Following Brookman and Thistle (2009), we include CEO gender in our analysis. Prior studies show that CEO characteristics, such as CEO gender and CEO

age, may influence corporate financing decisions. Therefore, we control CEO gender and CEO age in this study. CEO gender is a dummy variable equal to 1 if the CEO is female and 0 otherwise. In this study, we measure CEO age by the age of the CEO in years. We also include board size (the total number of members of the board of directors) and board independence (the ratio of independent directors to total directors of the firm) (Florackis & Sainani, 2018). Rutherford, Buchholtz, and Brown (2007) explain in their study that frequent board meetings help board members to gather more internal information about the firm, especially financial information, which can mitigate CEOs' action by reducing their power. Veprauskaitė and Adams (2013) also use board meetings (the total number of board meetings held during the year) as a control variable by viewing them as an important proxy to understand the information flow and processing at the board level. Interdependent directors (the number of interdependent directors divided by the total number of directors in the firm) are also included.[6]

2.3.3.3.2 Firm characteristics

We also include several firm-specific variables as controls, namely firm size, return on equity (ROE), debt to equity ratio, market to book ratio, dividend, research and development (R&D), capital expenditure (CAPEX), working capital, cash flow, and cash flow volatility. In this study, firm size is measured as the natural logarithm of the book value of the total assets. ROE is calculated as the net income divided by the total shareholders' equity. The debt to equity ratio is calculated as the total debt divided by the total shareholders' equity. The market to book ratio is measured as (the book value of assets minus the book value of equity plus the market value of equity) divided by the book value of assets. Dividend is a dummy variable equal to 1 if the firm pays dividends and 0 otherwise. R&D is research and development expenses divided by the total assets.[7] Capital expenditure is measured as the natural logarithm of CAPEX.[8] We measure working capital by dividing it by total revenue. In this study,

[6] Daily and Johnson (1997) explain that interdependent directors are those who are appointed by the CEO or who join the firm after the date of joining of the CEO. They further state that a higher ratio of interdependent directors on the board reflects CEOs having greater power and more decision-making autonomy.
[7] Following Opler et al. (1999), we input a number of zero if the firms do not report R&D expenses.
[8] Though CAPEX data are readily available in Morning Star (DatAnalysis) and no further calculations are needed, it is measured as the ratio of capital expenditures to total assets.

we also include cash flow (the cash flow divided by the total assets) and cash flow volatility[9] (the standard deviation of the firm's cash flow scaled by the total assets over the prior three-year period).

2.4 Empirical results

2.4.1 Descriptive statistics

Table 4 reports the descriptive statistics of the dependent, independent, and control variables used in this study. We find from Table 4 that Australian firms keep 22% of their total assets in the form of cash and marketable securities. Additionally, when cash is deflated by net assets, the result represents 30% of net assets being kept in the form of cash. Of the CEOs, 12% are also board chairpersons. The average (median) tenure of the CEO is 6.43 (6) years. Furthermore, 34% of CEOs are also founders and 92% have functional expertise. The mean ratio of CEOs' total annual compensation to the top executive's compensation is 1.64. In Australia, 23% of CEOs receive bonuses in addition to their fixed compensation. The average of the ratio of CEO annual compensation to total annual board compensation is 0.44. Among the CEOs in Australia, 3% are female and CEOs' average age is 52 years.

[9] This follows Demerjian, Lev, Lewis, and McVay (2013).

Table 4

Descriptive statistics

	Mean	Median	St. Dev.	25%	75%
Cash holdings variables					
Cash & Mkt Sec./Total Assets	0.22	0.12	0.24	0.05	0.31
Cash & Mkt Sec./Net Assets	0.83	0.14	2.31	0.05	0.45
Cash/Net Assets	0.30	0.18	0.36	0.06	0.43
Log (Cash/Net Assets)	-2.02	-2.06	1.94	-3.21	-0.85
CEO power variables					
P_INDEX_1	0.00	-0.11	1.00	-0.99	0.60
P_INDEX_2	0.00	-0.29	1.00	-1.32	0.70
CEO Duality	0.12	0.00	0.33	0.00	0.00
CEO Tenure	6.43	6.00	3.97	3.00	9.00
CEO Founder	0.34	0.00	0.48	0.00	1.00
CEO Ownership	0.08	0.02	0.15	0.00	0.08
CEO Functional Experience	0.92	1.00	0.27	1.00	1.00
CompRatio	1.64	1.28	1.58	1.00	1.86
CEO Remuneration	0.44	0.47	0.33	0.16	0.65
CEO Bonus Pay	0.23	0.00	0.42	0.00	0.00
Control variables					
CEO Gender	0.03	0.00	0.16	0.00	0.00
CEO Age	51.91	52.00	6.52	48.00	55.00
Board Size	6.38	6.00	2.64	5.00	8.00
Board Independence	0.35	0.38	0.26	0.07	0.57
Interdependent Director	3.69	4.00	2.53	2.00	5.00
Board Meetings	6.62	6.00	6.14	2.00	9.00
Log(Firm Size)	18.10	17.97	2.28	16.54	19.53
ROE	-0.17	0.01	1.04	-0.20	0.14
Debt to Equity	0.35	0.11	0.77	0.00	0.49
Market to Book	2.34	1.42	3.04	0.96	2.40
Dividend Pay	0.39	0.00	0.49	0.00	1.00
R&D/Total Assets	0.23	0.04	0.39	0.00	0.26
Log (CAPEX)	16.04	16.18	2.76	14.33	17.99
WC/Total Revenue	-0.69	0.00	2.80	-0.33	0.15
Cash Flow/Total Assets	-0.05	0.02	0.30	-0.10	0.10
Cash Flow Volatility	0.10	0.05	0.13	0.02	0.11

This table provides the descriptive statistics of all the variables used in this study. After excluding duplicate observations, observations related to the financial industry and real estate industry, and firms with missing values, 9708 firm-years have complete information on the CEO level, board level, and firm level. Details of each variable used in the study are presented in Appendix A.

The average board size in Australia is almost 7 members, of whom 35% are independent. The average number of interdependent directors is almost 4, indicating that Australian CEOs may enjoy more power given that Daily and Johnson (1997) argue that, as interdependent directors are nominated by the CEO, they become sympathetic to the CEO's decision-making. Such CEOs enjoy more power if the board has a larger number of interdependent directors. Boards of directors in Australian listed firms meet more than 6 times a year on average. The mean value of the log of Australian listed firms' total assets is 18.10. The average ROE, debt to equity, and market to book ratios are -0.17, 0.35, and 2.34, respectively. Moreover, 39% of Australian listed firms pay dividends every year. The research and development expenditure to total assets is 23% on average. The average log of CAPEX, working capital to total sales/revenue, and cash flow to total assets are 16.04, -0.69, and -0.05, respectively.

2.4.2 Correlation matrix

Table 5 reports the results from the correlation matrix of the variables used in this study. Cash holdings (cash and marketable securities to total assets) are positively correlated with *P_INDEX_2*, the market to book ratio, and cash flow volatility but negatively correlated with the CEO age, board size, interdependent directors, board independence, firm size, ROE, dividend pay, and CAPEX. The relationship between cash holdings and CEO gender and R&D is not significant. *P_INDEX_1* is positively correlated with almost all the control variables except the market to book ratio and cash flow volatility, for which the relationship is negative. A positive significant relationship also exists between *P_INDEX_2* and variables such as CEO age, interdependent directors, market to book ratio, and cash flow to total assets. *P_INDEX_2* is also negatively correlated with the CEO gender, board size, board independence, board meetings, firm size, debt to equity, and CAPEX.

Table 5

Pearson's correlation analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Cash & Mkt Sec./Total Assets	1.00																		
(2) P_INDEX_1	-0.06***	1.00																	
(3) P_INDEX_2	0.05***	-0.02	1.00																
(4) CEO Gender	0.02	0.02*	-0.03**	1.00															
(5) CEO Age (Log)	-0.05***	0.05***	0.07***	-0.05***	1.00														
(6) Board Size (Log)	-0.17***	0.05***	-0.23***	0.03**	0.03**	1.00													
(7) Interdependent Director (Log)	-0.11***	0.07***	0.42***	-0.01	0.10***	0.33***	1.00												
(8) Board Independence	-0.07***	0.16***	-0.04***	0.02	0.10***	0.12***	0.12***	1.00											
(9) Board Meetings (Log)	-0.20***	0.15***	-0.15***	0.01	0.07***	0.52***	0.24***	0.37***	1.00										
(10) Firm Size (Log)	-0.41***	0.20***	-0.14***	-0.00	0.13***	0.57***	0.27***	0.38***	0.61***	1.00									
(11) ROE	-0.18***	0.07***	0.01	-0.01	0.01	0.09***	0.06***	0.09***	0.15***	0.27***	1.00								
(12) Debt to Equity	-0.24***	0.01	-0.05***	-0.00	0.01	0.13***	0.05***	0.04***	0.13***	0.24***	-0.29***	1.00							
(13) Market to Book	0.34***	-0.06***	0.09***	0.00	-0.04***	-0.09***	-0.03***	-0.05***	-0.12***	-0.30***	-0.11***	-0.15***	1.00						
(14) Dividend Pay	-0.32***	0.14***	0.00	0.02*	0.08***	0.31***	0.17***	0.25***	0.41***	0.58***	0.26***	0.14***	-0.15***	1.00					
(15) R&D/Total Assets	0.01	-0.02	0.02	-0.02*	-0.04***	-0.08***	-0.05***	-0.04***	-0.05***	-0.08***	-0.03**	-0.01	0.00	-0.03**	1.00				
(16) CAPEX (Log)	-0.39***	0.16***	-0.10***	-0.03**	0.10***	0.47***	0.24***	0.32***	0.51***	0.84***	0.23***	0.19***	-0.22***	0.45***	-0.07***	1.00			
(17) WC/Total Revenue	-0.17***	0.06***	-0.03**	0.02	0.03*	0.09***	0.04***	0.08***	0.16***	0.19***	0.10***	0.08***	-0.14***	0.22***	0.01	0.13***	1.00		
(18) Cash Flow/Total Assets	-0.38***	0.11***	0.03**	-0.01	0.03**	0.15***	0.12***	0.17***	0.26***	0.52***	0.40***	0.13***	-0.40***	0.43***	-0.04***	0.49***	0.20***	1.00	
(19) Cash Flow Volatility	0.33***	-0.08***	-0.01	-0.01	-0.07***	-0.12***	-0.10***	-0.15***	-0.21***	-0.42***	-0.21***	-0.12***	0.33***	-0.29***	0.03**	-0.37***	-0.11***	-0.51***	1.00
N	9708																		

This table summarizes the result of the Pearson correlation matrices among the variables used in this study. Refer to Appendix 1 for the definition of the variables. The correlations are * statistically significant at the 10% level; ** statistically significant at the 5% level; and *** statistically significant at the 1% level.

2.4.3 Multivariate analysis

Tables 6 and 7 show the results of the pooled OLS regression with clustered robust standard errors at firm level for the three cash holdings models and CEO power reported in Eq. (1) and Eq. (2), respectively. First, we run OLS regression with all the cash holdings measures (Bates et al., 2009; Opler et al., 1999) and find that the CEO power indices are significantly positive across all the cash holdings measures (the results are shown in Appendices B and C). Subsequently, we run pooled OLS regression with clustered robust standard errors and obtain similar results across all the cash holdings measures.[10] For model 1 and model 3, we follow the cash holdings measures suggested by Bates et al. (2009) and for model 2, we follow Opler et al. (1999). We also include the same corporate governance and firm-level control variables across all the cash holdings models following Opler et al. (1999), (Veprauskaitė & Adams, 2013), and Florackis and Sainani (2018). Definitions of all the variables are given in Appendix A.

2.4.3.1 Cash holdings and the CEO power index (*P_INDEX_1*)

Table 6 presents the regression results between cash holdings measures and *P_INDEX_1*. The economic magnitude of the results suggests that they are strongly significant in models 1 and 3 and moderately significant in model 2. The association across all the models in Table 6 is positive. Most of the coefficients of corporate governance and firm-level control variables are consistent with the prior literature for US and UK firms (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018; Opler et al., 1999) in models 1 to 3. In model 1, the coefficients for firm size, ROE, debt to equity, dividend pay, CAPEX, working capital to total revenue, and cash flow to total assets are negative and statistically significant. Firms that are large, with high levels of ROE and debt, and those that pay more dividends and have higher working capital to total revenue and higher cash flow to total assets hold less cash. On the other hand, the coefficients for the market to book ratio and cash flow volatility are significant and positive, implying that firms with high market to book ratios and

[10] We also run alternative measures of cash holdings following Bates et al. (2009) for robustness purposes and find significant results.

higher cash flow volatility hold more cash. Florackis and Sainani (2018) also suggest that, to take advantage of the investment opportunities, firms with higher cash flow volatility hold more cash. For governance variables, firms with young CEOs and a lower number of interdependent directors keep higher amounts of cash or cash equivalent than others. On the contrary, the coefficients for board size, board independence, and board meetings are positive and significant. The result for R&D to total assets is contrary to US and UK firms (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018; Opler et al., 1999) except in model 3.

In model 2, the coefficients for board size, board independence, board meetings, firm size, market to book ratio, dividend pay, and cash flow volatility are significant and positive. On the other hand, the CEO age, interdependent directors, debt to equity, CAPEX, working capital to total revenue, and cash flow to total assets have a significant negative relationship with cash holdings. In model 3, we adopt new measures of cash holdings and rerun the regression. We find the coefficient for *P_INDEX_1* to be still positive at the 1% level of significance. Similarly, the coefficients for corporate governance and firm-level variables have the same relationship with cash holdings as the other models. Considering the results from the three different models of cash holdings, it is evident that Table 6 strongly supports the positive relationship between *P_INDEX_1* and corporate cash holdings.

Table 6
Multivariate analysis

Variables	Cash & Mkt Sec./Total Assets	Cash & Mkt Sec./Net Assets	Cash/ Net Assets
	Model 1	**Model 2**	**Model 3**
P_INDEX_1	0.0093***	0.0427*	0.0160***
	(3.8410)	(1.8624)	(4.2305)
CEO Gender	0.0054	-0.1246	0.0370*
	(0.5035)	(-1.2343)	(1.9263)
CEO Age (Log)	-0.0302*	-0.0464	-0.0422*
	(-1.9530)	(-0.3314)	(-1.7149)
Board Size (Log)	0.0328***	0.1754**	0.0309***
	(4.4169)	(2.4055)	(2.5785)
Interdependent Director (Log)	-0.0160***	-0.0510*	-0.0209***
	(-4.8691)	(-1.6810)	(-4.0318)
Board Independence	0.0227**	0.1307	0.0312**
	(2.3670)	(1.4594)	(2.0250)
Board Meetings (Log)	0.0137***	0.0834**	0.0171***
	(3.8030)	(2.5455)	(2.8877)
Firm Size (Log)	-0.0098***	0.0564**	-0.0086**
	(-4.1305)	(2.5061)	(-2.2379)
ROE	-0.0168***	-0.0517	-0.1125***
	(-5.2338)	(-1.4935)	(-14.2930)
Debt to Equity	-0.0386***	-0.1098***	0.0523***
	(-13.8227)	(-4.4557)	(6.6560)
Market to Book	0.0134***	0.0622***	0.0162***
	(10.1622)	(4.4910)	(8.3900)
Dividend Pay	-0.0201***	0.0096	-0.0067
	(-4.1771)	(0.2511)	(-0.7867)
R&D/Total Assets	-0.0231**	-0.2614***	0.0051
	(-1.9892)	(-2.8660)	(0.2323)
CAPEX (Log)	-0.0139***	-0.1641***	-0.0177***
	(-7.8556)	(-8.7220)	(-6.8966)
WC/Total Revenue	-0.0040***	-0.0331***	-0.0064***
	(-4.0584)	(-3.0737)	(-4.7219)
Cash Flow/Total Assets	-0.0259*	-1.0857***	0.1681***
	(-1.8209)	(-6.8378)	(7.0430)
Cash Flow Volatility	0.1921***	1.4632***	0.3482***
	(7.0805)	(4.8843)	(8.3770)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Constant	0.5880***	1.4582**	0.6791***
	(9.1390)	(2.5434)	(6.4511)
Observations	9,708	9,708	9,707
R-squared	0.3280	0.2066	0.2568

This table contains the results of the pooled ordinary least square (OLS) regression with cluster-robust standard errors at firm level of the three cash holdings models and the CEO power index (*P_INDEX_1*) reported in Eq. (1). We run OLS regressions by adding year and industry fixed effects in all regressions. This study includes all firms listed on the ASX for the observation period 2001 to 2015 except financial intuitions, banks and insurance companies (for details see section 3.1). The sample consists of 9708 firm-year observations. This table represent the regression result between three cash holdings measures and *P_INDEX_1*. Model 1 is the ratio of cash and marketable securities to total assets, model 2 is the ratio of cash and marketable securities to net assets and model 3 is the ratio of cash to net assets. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

2.4.3.2 Cash holdings and the CEO power index (*P_INDEX_2*)

To further examine the relationship between CEO power and corporate cash policies, we use another CEO power index, termed *P_INDEX_2*. Table 7 shows the regression results for the cash holdings measures and *P_INDEX_2*. The results indicate that all three models show a positive and significant relationship between *P_INDEX_2* and cash holdings measures.

In model 1 of Table 7, the coefficients for firm size, debt to equity, dividend pay, CAPEX, working capital to total revenue, and cash flow to total assets are negative and statistically significant, consistent with the prior literature for US and UK firms (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018). Also consistent with the prior literature, the cash holdings measures are significantly associated with the market to book ratio and cash flow volatility is significant and positive, implying that such firms hold more cash and vice versa. Following Harford et al. (2008), Veprauskaitė and Adams (2013), Custódio and Metzger (2014), and Florackis and Sainani (2018), we include CEO-level and board-level control variables and mostly find these to be consistent with the prior studies. The coefficients for board size, board meetings, and board independence are significant at the 1%, 1%, and 5% levels, respectively. On the contrary, similar to model 1 in Table 6, we find a significant but negative relationship between cash holdings and CEO age, interdependent directors, and R&D to total assets.

In model 2, the cash and marketable securities to net assets ratio is positively significant at the 1% level, with *P_INDEX_2* indicating that, in economic terms, powerful CEOs hold 5.55% more cash than their non-powerful counterparts. The coefficients for the board size, board independence, board meetings, firm size, market to book ratio, dividend pay, and cash flow volatility are significant and positive, consistent with model 2 in Table 6. On the other hand, the CEO age, interdependent directors, ROE, debt to equity, CAPEX, working capital to total revenue, and cash flow to total assets have a significantly negative relationship. In model 3, we adopt new measures of cash holdings and rerun the regressions. We find that the coefficients for *P_INDEX_2* are still positive at the 5% level of significance. Similarly, the coefficients for corporate governance and firm-level control variables have significant economic magnitudes except debt to equity and cash flow to total assets. Therefore, it

is evident that Table 7 also supports the positive relationship between *P_INDEX_2* and corporate cash holdings.

Table 7
Multivariate analysis

Variables	Cash & Mkt Sec./Total Assets	Cash & Mkt Sec./Net Assets	Cash/ Net Assets
	Model 1	**Model 2**	**Model 3**
P_INDEX_2	0.0041**	0.0555***	0.0068**
	(2.0399)	(2.9800)	(2.0657)
CEO Gender	0.0046	-0.1301	0.0355*
	(0.4238)	(-1.2897)	(1.8543)
CEO Age (Log)	-0.0262*	-0.0267	-0.0354
	(-1.7014)	(-0.1921)	(-1.4397)
Board Size (Log)	0.0258***	0.1550**	0.0189
	(3.5390)	(2.1559)	(1.5878)
Interdependent Director (Log)	-0.0090***	-0.0214	-0.0089**
	(-3.2105)	(-0.8201)	(-1.9742)
Board Independence	0.0195**	0.1009	0.0258*
	(2.0302)	(1.1232)	(1.6681)
Board Meetings (Log)	0.0128***	0.0775**	0.0156***
	(3.5633)	(2.3948)	(2.6257)
Firm Size (Log)	-0.0108***	0.0495**	-0.0102***
	(-4.5390)	(2.2487)	(-2.6677)
ROE	-0.0168***	-0.0518	-0.1124***
	(-5.2403)	(-1.4975)	(-14.2992)
Debt to Equity	-0.0386***	-0.1088***	0.0523***
	(-13.8591)	(-4.4236)	(6.6623)
Market to Book	0.0136***	0.0630***	0.0166***
	(10.3280)	(4.5622)	(8.5771)
Dividend Pay	-0.0187***	0.0136	-0.0043
	(-3.9078)	(0.3610)	(-0.5043)
R&D/Total Assets	-0.0221*	-0.2540***	0.0068
	(-1.9113)	(-2.7930)	(0.3123)
CAPEX (Log)	-0.0137***	-0.1636***	-0.0175***
	(-7.7752)	(-8.7204)	(-6.8059)
WC/Total Revenue	-0.0040***	-0.0331***	-0.0065***
	(-4.0773)	(-3.0776)	(-4.7519)
Cash Flow/Total Assets	-0.0234*	-1.0763***	0.1724***
	(-1.6456)	(-6.7871)	(7.2219)
Cash Flow Volatility	0.1890***	1.4416***	0.3429***
	(6.9468)	(4.8301)	(8.2330)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Constant	0.5792***	1.4387**	0.6635***
	(8.9809)	(2.5126)	(6.2911)
Observations	9,708	9,708	9,707
R-squared	0.3272	0.2070	0.2557

This table contains the results of the pooled ordinary least square (OLS) regression with cluster-robust standard errors of the three cash holdings models and the CEO power index (*P_INDEX_2*) reported in Eq. (2). We run OLS regressions by adding year and industry fixed effects in all regressions. This study includes all firms listed on the ASX for the observation period 2001 to 2015 except financial intuitions, banks and insurance companies (for details see section 3.1). The sample consists of 9708 firm-year observations. This table represent the regression result between three cash holdings measures and *P_INDEX_2*. Model 1 is the ratio of cash and marketable securities to total assets, model 2 is the ratio of cash and marketable securities to net assets and model 3 is the ratio of cash to net assets. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Jensen (1986) explains that entrenched managers are not interested in reducing the level of cash by making dividend payments to the shareholders due to agency conflict. In another instance, Jensen (1986) identifies entrenched managers as preferring not to become dependent on capital markets for funds. Therefore, our evidence is consistent with arguments that powerful CEOs are willing to keep more cash than their non-powerful counterparts to reduce the uncertainty and dependency on the capital markets.

2.5 Robustness check

2.5.1 Alternative measures of cash holdings

The results from our main models show a positive relationship between CEO power and corporate cash holdings. To support the results from our main models, in this section, we use three alternative measures of cash holdings. Table 8 represents the regression results of alternative measures of cash holdings and CEO power indices, *P_INDEX_1* and *P_INDEX_2*. In models 1 and 2, the dependent variable is the natural log of the ratio of cash to net assets (Bates et al., 2009). We define another measure of cash holdings, used in models 3 and 4, as the ratio of cash and marketable securities to lagged net assets.[11] In models 5 and 6, our final alternative measure of cash holdings is the ratio of cash to lagged net assets. Panel A of Table 7 presents the results from the alternative measures of cash holdings and *P_INDEX_1*. Similarly, panel B of Table 8 presents the results from the alternative measures of cash holdings and *P_INDEX_2*. Following Opler et al. (1999), we only use firm characteristics in models 1, 3, and 5 for all the alternative measures of cash holdings in both panel A and panel B. We find that the economic magnitude of the results from models 1, 3, and 5 for both panel A and panel B is significant and the association is positive. Subsequently, we include corporate governance variables (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018; Harford et al., 2008; Veprauskaitė & Adams, 2013) for all the alternative measures of cash holdings and rerun the regressions. Models 2, 4, and 6 of both panel A and panel B report the regression results of corporate cash holdings

[11] Faff, Kwok, Podolski, and Wong (2016) measure cash holdings as the ratio of cash and marketable securities to lagged total assets. We use lagged net assets instead of lagged total assets.

and CEO power indices (*P_INDEX_1* and *P_INDEX_2*) after including corporate governance variables in addition to existing firm characteristics. The results continue to support a significant and positive relationship between both CEO power indices and corporate cash holdings. The economic magnitude of the result is also significant. For example, a 1 standard deviation increase in *P_INDEX_1* in model 2 of panel A increases cash holdings by 3.96% for the mean firms in the sample. Consequently, considering the evidence in Table 8, we can conclude that the alternative measures of cash holdings validate our main analysis in a material way, further reinforcing our main findings.

Table 8
Alternative measures of cash holdings

Panel A: P_INDEX_1						
Variables	**Log (Cash/ Net Assets)**	**Log (Cash/ Net Assets)**	**Cash & Mkt Sec./ Lagged Net Assets**	**Cash & Mkt Sec./ Lagged Net Assets**	**Cash/Lagged Net Assets**	**Cash/Lagged Net Assets**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
P_INDEX_1	0.0324*	0.0799***	0.0920***	0.1306***	0.0859***	0.1181***
	(1.9409)	(4.0281)	(3.7499)	(4.4275)	(3.6363)	(4.2179)
Corporate governance variables	NO	YES	NO	YES	NO	YES
Firm characteristics	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Industry effects	NO	YES	NO	YES	NO	YES
Constant	-0.4043*	0.9421*	-0.4874*	0.3489	-0.4890*	1.3148*
	(-1.8502)	(1.7080)	(-1.7624)	(0.4547)	(-1.8189)	(1.7831)
Observations	9,654	9,654	9,128	9,128	9,128	9,128
R-squared	0.2481	0.2861	0.1783	0.1795	0.1771	0.1965
Panel B: P_INDEX_2						
Variables	**Log (Cash/ Net Assets)**	**Log (Cash/ Net Assets)**	**Cash & Mkt Sec./ Lagged Net Assets**	**Cash & Mkt Sec./ Lagged Net Assets**	**Cash/Lagged Net Assets**	**Cash/Lagged Net Assets**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
P_INDEX_2	0.0345**	0.0334*	0.0401*	0.0416*	0.0427*	0.0389*
	(1.9678)	(1.9300)	(1.6738)	(1.7447)	(1.8374)	(1.7098)
Corporate governance variables	NO	YES	NO	YES	NO	YES
Firm characteristics	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Industry effects	NO	YES	NO	YES	NO	YES
Constant	-0.3272	0.8614	-0.2502	0.3140	-0.2622	1.2462*
	(-1.4990)	(1.5619)	(-0.9433)	(0.4079)	(-1.0312)	(1.6858)
Observations	9,654	9,654	9,128	9,128	9,128	9,128
R-squared	0.2481	0.2852	0.1771	0.1777	0.1760	0.1950

This table contains the results of the pooled ordinary least square (OLS) regression with cluster-robust standard errors of the three alternatives measures of cash holdings and the CEO power indices i.e. *P_INDEX_1* and *P_INDEX_2*. Panel A of this table reports the regression result between three alternative measures of cash holdings and *P_INDEX_1*. Panel B of this table reports the regression result between three alternative measures of cash holdings and *P_INDEX_2*. We only use firm characteristics in models 1, 3 and 5 in both panels A and B. Subsequently, we include corporate governance variables along with firm characteristics in models 2, 4 and 6 both in panels A and B and rerun the regression. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

2.5.2 Interaction with the global financial crisis

To assess whether the global financial crisis (GFC) influences our results, we incorporate the GFC as an interaction variable with *P_INDEX_1* and *P_INDEX_2*. Following Degl'Innocenti, Grant, Šević, and Tzeremes (2018), we consider 2007 and 2008 as the global financial crisis period. To interact the GFC with *P_INDEX_1* and *P_INDEX_2*, we construct a dummy variable named GFC, coded 1 if the year falls in the GFC period and 0 otherwise.

Table 9 presents the interaction results of cash holdings and CEO power indices, that is, *P_INDEX_1* and *P_INDEX_2*, with the GFC. Panel A of Table 9 contains the results of cash holdings and *P_INDEX_1* when the GFC is interacted with *P_INDEX_1*. Similarly, panel B of Table 9 presents the results of cash holdings and *P_INDEX_2* when the GFC is interacted with *P_INDEX_2*. From panel A of Table 9, we can see that, irrespective of the GFC period and non-GFC periods, the association across all the models remains positive and the economic magnitude of the result significant. However, we do observe that powerful CEOs are willing to keep more cash in the GFC period than in non-GFC periods. In models 1 to 3, powerful CEOs keep 1.43%, 6.42%, and 3.18%, respectively, more cash in the GFC period than in non-GFC periods. Panel B of Table 9 shows that the association across all the models of cash holdings is positive when *P_INDEX_2* is interacted with the GFC period and non-GFC periods and the economic magnitude of the result is significant in the non-GFC period. The economic magnitude is not significant in the GFC period, because, during the GFC period, the growth rate of CEO compensation[12] decreased. An unreported table shows that, in 2007 and 2008, the CEO compensation growth decreased by 2.44% and 1.01%, respectively.

[12] P_INDEX_2 is the result of principal component analysis of the compensation ratio, CEO remuneration, and CEO bonus pay. All these proxies for CEO power are related to CEO compensation.

Table 9
Interaction with the global financial crisis (GFC)

Panel A: Interaction of P_INDEX_1 with the global financial crisis (GFC)			
Variables	**Cash & Mkt Sec./Total Assets**	**Cash & Mkt Sec./Net Assets**	**Cash/Net Assets**
	Model 1	**Model 2**	**Model 3**
P_INDEX_1 X GFC Period	0.0214***	0.1043*	0.0430***
	(3.7997)	(1.7608)	(5.3282)
P_INDEX_1 X Non-GFC Period	0.0071***	0.0401*	0.0112***
	(2.8501)	(1.6958)	(2.8028)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.5841***	0.8793	0.6701***
	(9.0711)	(1.5328)	(6.3586)
Observations	9,708	9,708	9,707
R-squared	0.3285	0.1879	0.2578
Panel B: Interaction of P_INDEX_2 with the global financial crisis (GFC)			
P_INDEX_2 X GFC Period	0.0031	0.0833	0.0022
	(0.5617)	(1.2924)	(0.2696)
P_INDEX_2 X Non-GFC Period	0.0043**	0.0503***	0.0076**
	(2.0041)	(2.7062)	(2.1430)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.5792***	1.4368**	0.6638***
	(8.9827)	(2.5091)	(6.2941)
Observations	9,708	9,708	9,707
R-squared	0.3272	0.2071	0.2557

This table represents the interaction results of three measures of cash holdings and the CEO power indices i.e. *P_INDEX_1* and *P_INDEX_2* at the time of global financial crisis and non-global financial crisis period. We run pooled ordinary least square (OLS) regression with cluster-robust standard errors by adding year and industry fixed effects in all regressions. We consider 2007 and 2008 as global financial crisis period (GFC). To interact GFC with *P_INDEX_1* and *P_INDEX_2*, we construct a dummy variable named GFC, coded 1 in the year falls in GFC period, otherwise 0 if the year falls in Non-GFC Period. In this table, we incorporate GFC and Non-GFC as interaction variables with *P_INDEX_1* and *P_INDEX_2*. Panel A of this table reports the regression result between all measures of cash holdings used in the main analysis and CEO power index (*P_INDEX_1*) with interaction effects of GFC and Non-GFC period. Similarly, Panel B of this table reports the regression result between all measures of cash holdings used in the main analysis and CEO power index (*P_INDEX_2*) with interaction effects of GFC and Non-GFC period. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

2.5.3 Alternative control variables

We replicate our main models (e.g. models 1, 2, and 3 of Table 6 and models 1, 2, and 3 of Table 7) using four alternative firm-level control variables to substantiate the relationship between CEO power and corporate cash holdings. We use the natural log of total sales (as a replacement for total assets) and return of assets (instead of return on equity) (Custódio & Metzger, 2014; Florackis & Sainani, 2018). We also use the total current assets minus the total current liability divided by the net assets instead of the working capital over the total revenue (Harford et al., 2012; Liu et al., 2014) and the standard deviation of the firm's cash flow scaled by the total sales over the prior three-year period instead of the existing cash flow volatility. Our results remain significant and show a positive association between both CEO power indices (*P_INDEX_1* and *P_INDEX_2*) and corporate cash holdings, further supporting our main findings in Tables 6 and 7.

2.6 Dealing with endogeneity

The main results of this study suggest that a significant positive association exists between our CEO power indices and corporate cash holdings. We also use alternative measures of cash holdings to verify our result and find consistent results. Furthermore, we lag our dependent variable and find no change to our results and interact our independent variable with the global financial crisis (GFC) to assess whether the GFC affected our results. We find that powerful CEOs hold more cash in the GFC period than in the non-GFC period. We also use alternative control variables and find quantitatively similar results. Though the sign, magnitude, and statistical significance of all the analyses in this study remain the same, we want to employ different endogeneity tests, because these estimates may be biased due to endogeneity.

Although we undertake a number of tests to undertake our main analysis and supplement these with additional robustness testing, it is possible that endogeneity issues may be affecting our results and we consequently address each potential endogeneity issue by undertaking additional econometric analyses. We discuss each potential endogeneity issue first before addressing them in subsequent sections. The first endogeneity concern is omitted variable bias. This concern may arise due to omitting variables supposed to be included in the vector of the independent variable

that may affect the corporate cash holdings. This omission is because of the nature of direct observability of those variables. The second concern is simultaneity/reverse causality/self-selection bias. The argument may arise whether X causes Y or Y causes X. Simultaneously, an organization can choose certain CEOs or certain CEOs may self-select into certain types of organizations. In our context, certain CEOs may be chosen based on their characteristics to align with the organizational financial policy, creating a matching problem. The third endogeneity concern is measurement error, which may arise through improper measurement of the variables due to the nature of their non-observability and be therefore difficult to quantify (for example, the construction of CEO power indices). The fourth concern is unobserved panel heterogeneity, which may arise when the dataset uses panel data containing observations on cross-sectional units such as firms or industries over time (Coakley, Fuertes, & Smith, 2006). The nature of the data may create a variety of unobserved heterogeneity in regression models. The final concern in this study are amendments to corporate governance policies, which represent an exogenous variation created by natural experiments. To deal with these endogeneity matters and following the prior literature (Florackis & Sainani, 2018; Liu & Mauer, 2011; Liu et al., 2014; Veprauskaitė & Adams, 2013), we use four econometric techniques, specifically PSM, DID, two-stage system GMM, and 2SLS. We believe that these four econometric techniques deal with the endogeneity issues outlined above.

2.6.1 Propensity score matching

To deal with endogeneity concerns in observational data, some studies use multiple regression models. Particularly, these models require the relationship between cash holdings and CEO power index to be designed properly to obtain unbiased estimates. Improper specification between cash holdings and CEO power index generates a problem named "functional form misspecification" (FFM) and subsequently can produce biased estimates. Therefore, if the treatment groups become more heterogeneous, the probability of biased estimation from FFM increases. Rosenbaum and Rubin (1983) suggest propensity score matching (PSM) techniques to deal with this concern, because PSM reduces the dependency on the specification of the relationship between variables. Therefore, to address the endogeneity that may arise from the CEO firm matching concern, we adopt the PSM technique.

To carry out PSM, we first create a treatment group from our independent variables. We create two dummy variables for *P_INDEX_1* and *P_INDEX_2*, which are equal to "1" for the CEOs who fall above or equal to the eightieth percentile of the respective power indices of CEOs and "0" otherwise based on year and industry. By implementing this isolation technique, we create a treatment group with high concentration of CEO power. Subsequently, we implement the PSM procedure in two stages. In the first stage, we run a logistic regression by pooling the treatment and control groups and calculate the propensity scores for each firm-year observation.[13] In the logistic model, we include board size, ratio of interdependent directors to board size, firm size, market to book ratio, cash flow to total assets, and industry and year effects to calculate the propensity score. In the second stage, we use the calculated propensity score to match each CEO with a high concentration of power with a CEO with a low concentration of power. During this stage, we use the nearest-neighbor matching technique without replacement, as suggested by Leuven and Sianesi (2003)[14], and we find 2,787 matches for CEOs with high concentration of power for *P_INDEX_1* and 2,419 for *P_INDEX*_2. Our final panel observation for PSM includes 4,424 and 4,338 matches for *P_INDEX_1* and *P_INDEX_2*, respectively.

Panel A and Panel B of Table 10 report the propensity score matching results. After matching CEOs with a high concentration of power with CEOs with a low concentration of power, we find that the relationship between CEOs with a high concentration of power and corporate cash holdings is positive. The result is also statistically significant at the 1% and 5% levels across all the cash holdings models for *P_INDEX_1* and *P_INDEX_2* except model 1 for *P_INDEX_2*. Results suggest that CEOs with a high concentration of power hold more cash than CEOs with a low concentration of power. Thus, the results of the propensity score matching approach alleviate the self-selection bias concern and CEO firm matching concern. Hence, these results further confirm the findings of our main model by mitigating the above-mentioned concerns.

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[13] We also conduct a covariate balance test (unreported) to verify that firms in the treatment and control groups are identical in terms of observable characteristics. We find that none of the differences between the firms' observable characteristics in the treatment and control groups are statistically significant.

[14] To ensure accurate matching, we set maximum difference between the propensity scores of the two groups to not exceed more than 0.05. In addition to this, we match the control group and treatment group based on industry and year.

Table 10
Propensity score matching (PSM)

Panel A: P_INDEX_1			
Variables	**Cash & Mkt Sec./Total Assets**	**Cash & Mkt Sec./Net Assets**	**Cash/Net Assets**
	Model 1	**Model 2**	**Model 3**
P_INDEX_1	0.0134***	0.0681**	0.0161***
	(3.8808)	(2.0587)	(2.9419)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.7600***	3.1255***	0.8516***
	(7.8939)	(3.8023)	(5.5516)
Observations	4,424	4,424	4,410
R-squared	0.3003	0.2008	0.2351
Panel B: P_INDEX_2			
P_INDEX_2	0.0035	0.0428**	0.0084**
	(1.4429)	(2.0106)	(2.0325)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.5426***	1.2699	0.6307***
	(6.3650)	(1.6349)	(4.2391)
Observations	4,338	4,338	4,349
R-squared	0.3774	0.2508	0.2562

This table reports the results from the propensity score matching (PSM) analysis for treatment (high concentration of CEOs' power) and control (low concentration of CEOs' power) groups. The treatment (high concentration of CEOs' power) group includes those firms whose CEOs' power indices fall above or equal to 80th percentile across all firms in year t. The control (low concentration of CEOs' power) group includes those firms whose CEOs' power indices fall below 80th percentile across all firms in year t. The propensity score in this table is predicated as a logit function of board size, ratio of interdependent director to board size, firm size, market to book ratio, cash flow to total assets, industry and year effect. Subsequently, we match each CEOs with high concentration of power with that of a CEOs with low concentration of power nearest neighbour matching technique without replacement suggested by Leuven and Sianesi (2003). We also use industry and year to do the matching. We run pooled ordinary least square (OLS) regression with cluster-robust standard errors by adding year and industry fixed effects in all regressions. Panel A of this table presents the regression result between all measures of cash holdings and equal size of treatment group and control group of *P_INDEX_1*. Panel B of this table presents the regression result between all measures of cash holdings and equal size of treatment group and control group of *P_INDEX_2*. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

2.6.2 Difference-in-differences

To deal with the treatment effects derived from a sudden change in government policy, economic environment, institutional environmental setting or a major amendment to existing policy, difference-in-differences (DID) estimators are used (Roberts & Whited, 2013). Due to the sudden introduction of a new policy, the new "changed" situation creates natural or quasi-experiments that can be dealt with using DID estimators. Therefore, the impact of the exogenous differences created by natural or quasi-experiments is much stronger than any other individual estimation technique. As this study is based on an Australian setting, any regulatory change or amendment related to our study during the sample period is considered an exogenous event. Thus, the changes and amendments recommended by the ASX Corporate Governance Council in 2010 have an impact on the explanatory variable of this study, that is, CEO power. Among the changes recommended, emphasis is given to keeping the majority of the board members as independent directors, maintaining the independent decision-making autonomy of the board members, and the independent nature of the directorship of the chair, establishing a nomination committee, promoting ethical and responsible decision-making practices, and establishing an audit committee and a remuneration committee. Particularly, the above-mentioned policy recommendations strengthen the corporate governance structure of an organization (Ashbaugh-Skaife, Collins, & LaFond, 2006; Bhagat & Bolton, 2008; Dittmar & Mahrt-Smith, 2007; Harford et al., 2008; Morellec, Nikolov, & SchÜRhoff, 2012; Nelson, 2005). Therefore, this policy amendment affects the decision-making autonomy of the CEOs and thus may have a negative impact on CEO power. To implement DID, we create a dummy variable for the treatment group and control group. The dummy variable (Δ CG Principles) of post-shock is equal to "1" if the date is the year after the shock and "0" if the date is the year before the shock, including the year of the shock. For equalization, we take five years after the shock and five years before the shock, including the year of the shock. We therefore implement the DID estimator using the following model:

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + \beta_2\ (\Delta\ CG\ Principles_{i,t}) + \beta_3\ (P\_INDEX\_1_{i,t} X \Delta\ CG\ Principles_{i,t}) + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (3)$$

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ P\_INDEX\_2_{i,t} + \beta_2\ (\Delta\ CG\ Principles_{i,t}) + \beta_3\ (P\_INDEX\_2_{i,t} X \Delta\ CG\ Principles_{i,t}) + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (4)$$

Equations (3) and (4) are used as a DID equation, and the coefficients β_0, β_1, β_2, and β_3 are the DID estimators. These capture the changes in firm cash holdings between the treatment and the control group before and after the corporate governance policy changes. To ensure consistency with the main model, we also use cluster-robust standard errors.

Panel A and Panel B of Table 11 report the results of the DID analysis. Panel A of Table 11 reports that, before the changes in policy, the relationship between *P_INDEX_1* and all three cash holdings models are positive and statistically significant (at the 1% level), but, as a result of the new changes and recommendation, when *P_INDEX_1* interacts with Δ *CG* Principles, the coefficient becomes negative but remains statistically significant at the 10%, 5%, and 10% levels, respectively. This result supports our prediction and suggests that the new changes in corporate governance strengthen the corporate governance structure of firms and affects the decision-making autonomy of CEOs. Therefore, the relationship between *P_INDEX_1* and all three cash holdings models is negative, indicating that CEOs hold less cash after the corporate governance policy changes improving the corporate governance structures under the agency theory framework.

Table 11
Difference-in-differences (DID)
Panel A: (P_INDEX_1) Evidence from Δ CG Principles in 2010

Variables	Cash & Mkt Sec./Total Assets	Cash & Mkt Sec./Net Assets	Cash/Net Assets
	Model 1	**Model 2**	**Model 3**
P_INDEX_1	0.0166***	0.1171***	0.0286***
	(4.3359)	(2.9500)	(5.2184)
Δ CG Principles	-0.0083	-0.0126	-0.0054
	(-0.8279)	(-0.1317)	(-1.3492)
P_INDEX_1 X Δ CG Principles	-0.0085*	-0.0866**	-0.0138*
	(-1.8703)	(-1.9637)	(-1.8330)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.6995***	2.1262***	0.7441***
	(9.0679)	(2.9039)	(9.1335)
Observations	6,735	6,735	6,734
R-squared	0.3419	0.2191	0.2587
Panel B: (P_INDEX_2) Evidence from Δ CG Principles			
P_INDEX_2	0.0051*	0.0693**	0.0063
	(1.6840)	(2.2195)	(1.1973)
Δ CG Principles	-0.0100*	-0.1023**	-0.0052
	(-1.7296)	(-2.1542)	(-0.2970)
P_INDEX_2 X Δ CG Principles	0.0035	0.0334	0.0084
	(0.8942)	(0.8022)	(1.1088)
Corporate governance variables	YES	YES	YES
Firm characteristics	YES	YES	YES
Year effects	YES	YES	YES
Industry effects	YES	YES	YES
Constant	0.6962***	2.2024***	0.7174***
	(9.8251)	(3.0846)	(5.5663)
Observations	6,735	6,735	6,734
R-squared	0.3394	0.2180	0.2390

This table reports the results of the Difference-in-differences (DID) analysis of this study. As this study is based on Australian setting, therefore, any regulatory change or amendments related to the study of interest during the sample period is considered as an exogenous event. Thus the changes and amendments recommended by ASX Corporate Governance Council in 2010 has an impact on the explanatory variable of this study i.e. CEO power (see section 6.2 for details). To implement DID, we create a dummy variable for the treatment group and control group. The dummy variable (Δ CG Principles) of Post-Shock equal to "1" if the date is the year after the shock and "0" if the date is the year before the shock including the year of shock. We run pooled ordinary least square (OLS) regression with cluster-robust standard errors by adding year and industry fixed effects in all regressions. Panel A of this table presents the regression result between all measures of cash holdings and *P_INDEX_1* with an interaction effect of ΔCG Principles. Panel B of this table presents the regression result between all measures of cash holdings and *P_INDEX_2* with an interaction effect of ΔCG Principles. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Panel B of Table 11 indicates that, before the changes in the policy, the coefficients of *P_INDEX_2* are positive in all three cash holdings models and statistically significant at the 10% and 5% levels, respectively, except in model 3. When *P_INDEX_2* interacts with Δ *CG* Principles, the coefficients remain positive but are reduced by 31.37% and 51.80% in model 1 and model 2, respectively. This result also supports our prediction and suggests that the new changes strengthen the corporate governance structure of firms and affects the remuneration-based power of CEOs. However, the impact of policy changes is greater on *P_INDEX_1*[15] than on *P_INDEX_2*,[16] because the policy change recommendation places more emphasis on the decision-making autonomy of the executive and board members than on the remuneration of executives.

2.6.3 Two-step system generalized method of moments (GMM) estimator

Arellano and Bover (1995) and Blundell and Bond (1998) report that the system GMM estimator is able to correct unobserved panel heterogeneity, omitted variable bias, and measurement error and is more robust than any other GMM estimators. Therefore, to address the above-mentioned endogeneity concerns, we utilize two-step system GMM estimators. Specifically, we use the two-step system GMM, because it is more robust than the one-step system GMM as well as more efficient and robust to heteroskedasticity and autocorrelation (Roodman, 2009). Furthermore, the two-step system GMM helps to control the dynamic relationship between the current values of the independent variable, that is, the CEO power indices, and the past values of cash holdings (see (Wintoki, Linck, & Netter, 2012).

[15] *P_INDEX_1* is the result of principal component analysis of CEO duality, CEO tenure, CEO ownership, CEO founder, and CEO functional experience. All these proxies for CEO power are related to the decision-making autonomy of CEOs.

[16] *P_INDEX_2* is the result of principal component analysis of the compensation ratio, CEO remuneration, and CEO bonus pay. All these proxies for CEO power are related to CEO compensation.

Table 12
Two-step system generalized method of moments (GMM) estimators

Panel A: P_INDEX_1			
Variables	**Cash & Mkt Sec./ Total Assets**	**Cash & Mkt Sec./ Net Assets**	**Cash/Net Assets**
	Model 1	**Model 2**	**Model 3**
L. Cash & Mkt Sec./Total Assets (t-1)	0.4665***		
	(4.8770)		
L. Cash & Mkt Sec./Net Assets (t-1)		0.3190***	
		(3.7803)	
L. Cash/Net Assets (t-1)			0.6144***
			(6.1233)
P_INDEX_1	0.0207**	0.2111**	0.0522***
	(2.0810)	(2.3903)	(2.9385)
Corporate governance variables	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	9,131	9,131	9,131
Hansen (p-value)	38.67 (0.801)	40.55 (0.735)	31.37 (0.802)
Diff-Hansen (p-value)	31.06 (0.463)	32.56 (0.390)	18.59 (0.725)
AR 1 (p-value)	-6.98 (0.000)	-4.86 (0.000)	-7.14 (0.000)
AR 2 (p-value)	-0.35 (0.725)	0.30 (0.767)	0.96 (0.338)
Panel B: P_INDEX_2			
L. Cash & Mkt Sec./Total Assets (t-1)	0.6979***		
	(9.9266)		
L. Cash & Mkt Sec./Net Assets (t-1)		0.6263***	
		(6.6791)	
L. Cash/Net Assets (t-1)			0.3631***
			(5.2234)
P_INDEX_2	0.0181*	0.1936*	0.0275*
	(1.6737)	(1.7317)	(1.6747)
Corporate governance variables	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Observations	9,131	9,131	9,131
Hansen (p-value)	43.80 (0.861)	44.52 (0.818)	73.43 (0.685)
Diff-Hansen (p-value)	38.04 (0.514)	39.74 (0.694)	65.16 (0.575)
AR 1 (p-value)	-9.11 (0.000)	-5.64 (0.000)	-7.48 (0.000)
AR 2 (p-value)	-0.02 (0.986)	0.92 (0.355)	0.09 (0.930)

This table presents the results of the system generalized method of moments (GMM) estimators of the three cash holdings models and the two CEO power indices (*P_INDEX_1* and *P_INDEX_2*). By implementing the two-step system GMM estimators, we better control different sources of endogeneity in this study namely omitted variables bias, measurement errors, unobserved panel heterogeneity, simultaneity and dynamic endogeneity as suggested by Ullah, Akhtar, and Zaefarian (2018). We run two-step system GMM estimators by using xtabond2, a STATA function written by Roodman (2009). Two-step system GMM estimators use lagged valued as regressors. These lagged levels of dependent variable in Arellano and Bond (1991) estimator are used as instruments in two-step system GMM estimators to deal with endogeneity. Due to the process of internal transformation, two-step system GMM reduces the number of firm year observation. The dynamic panel data system GMM model extends the fixed-effects model further by including the lagged value of dependent variable in the regression as instruments, thereby it controls the dynamic nature of endogeneity (Ullah et al., 2018). Panel A of this table presents the two-step system GMM estimators between all measures of cash holdings and *P_INDEX_1*. Panel B of this table presents the two-step system GMM estimators between all measures of cash holdings and *P_INDEX_2*. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Panel A and Panel B of Table 12 report the results of the two-step system GMM. To test the presence of serial correlation, we run the Arellano–Bond test, because, if the error terms are correlated over time, the GMM estimator will be inconsistent in the dynamic panel model. The results in both Panel A and Panel B show that the null hypothesis is rejected in the first test (AR(1)) but not in the second test (AR(2)), showing no evidence that the errors are correlated over time. We also run the *Hansen J-test* to determine the validity of the instrumental variables. The *Hansen J-statistic* yields *p-values* for Panel A (0.801, 0.735, and 0.802 for models 1, 2, and 3, respectively) and Panel B (0.861, 0.818, and 0.685 for models 1, 2, and 3, respectively). Therefore, the *p-value* across all the models is more than 5%, which means that we cannot reject the null hypothesis that our instruments are valid (Hansen, 1982). Additionally, we run the Diff-Hansen test to confirm the validity of the additional instruments utilized by the system GMM estimator. Diff-Hansen yields *p-values* for Panel A (0.463, 0.390, and 0.725 for models 1, 2, and 3, respectively) and Panel B (0.514, 0.694, and 0.575 for models 1, 2, and 3, respectively). Consequently, the *p-values* indicates that we cannot reject the null hypothesis and therefore the validity of the additional instruments.

To test the dynamic nature of the CEO power indices and cash holdings models, the lagged dependent variable is used in the system GMM estimator. Panel A and Panel B of Table 12 report that the lagged dependent variables (models 1, 2, and 3) are statistically significant in all three models of cash holdings in both Panel A and Panel B at the 1% level. Thus, they do not reject the dynamic nature of the models. Panel A of Table 11 also reports that the relationship between the CEO power indices (*P_INDEX_1* and *P_INDEX_2*) and all three cash holdings models (1, 2, and 3) is still positive and statistically significant (5%, 5%, and 1% and 1%, 1%, and 1%, respectively). Consequently, the two-step system GMM estimator further confirms the result of our main model after mitigating unobserved panel heterogeneity, omitted variable bias, measurement error.

2.6.4 Two-stage least squares (2SLS)

The final econometric technique that we implement in this study is 2SLS, which addresses the causality and endogeneity concerns by using instrumental variables. To do this, we need an instrumental variable that is not correlated with the

error term but influences the independent variable. Following Liu et al. (2014), we use the firm age as an instrumental variable.[17]

Panel A and Panel B of Table 13 report the 2SLS regression results. In the first stage, we obtain the predicated value of the endogenous independent variable from regressing the endogenous independent variable on the instrumental variable. In the second stage, we run our main model of the dependent variables on the exogenous independent variable and the predicated value obtained from the first-stage regression in lieu of observations of the endogenous variables. After including the instrumental variable, the relationship between CEO power indices (i.e. *P_INDEX_1* and *P_INDEX_2*) and all three cash holdings models is positive and statistically significant at the 1% level. Following Larcker and Rusticus (2010), we perform several tests to evaluate the validity of the instrument. To identify the presence of a weak instrument, our weak instrument test reports that the omitted instrument is correlated with the endogenous independent variable, because the corrected Cragg–Donald Wald F statistic [(for *P_INDEX_1*, 190.05, 190.05, and 190.319) and (for *P_INDEX_2*, 279.694, 279.694, and 279.694)] is greater than the Stock and Yogo (2005) benchmark value [(for *P_INDEX_1*, 16.38) and (for *P_INDEX_2*, 16.38)] at the 10% level. We also perform the Hansen's overidentifying restrictions test and find that the equation is exactly identified (p=0.000) in both *P_INDEX_1* and *P_INDEX_2* for all three models of cash holdings, because we use one instrument. Furthermore, we perform an underidentification test (LM statistic), the result of which suggests that the omitted instrument is relevant.

[17] It is quite difficult to argue that the cash reserves of older firms are greater than those of younger firms. However, due to the operational maturity and a well-established structure, it seems that older firms have a good corporate governance structure and therefore firm age may have a negative relationship with CEO power indices.

Table 13
Two-stage least squares (2SLS)
Panel A: P_INDEX_1

Variables	**First stage P_INDEX_1**	**Second stage Cash & Mkt Sec./ Total Assets**	**Second stage Cash & Mkt Sec./ Net Assets**	**Second stage Cash/Net Assets**
		Model 1	Model 2	Model 3
Firm Age	-0.0098***			
	(-15.1712)			
P_INDEX_1		0.1085***	0.5533***	0.1688***
		(7.0140)	(4.5103)	(6.2093)
Corporate governance variables	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Constant	-1.6078***	0.7085***	2.0778***	0.8644***
	(-5.6526)	(10.0158)	(3.5237)	(7.4486)
Observations	9,705	9,705	9,705	9,704
R-squared		0.2020	0.1608	0.1334
Underidentification test				
Kleibergen–Paap rk LM statistic		209.792	209.792	210.062
p-value		0.000	0.000	0.000
Weak identification test				
Corrected Cragg–Donald Wald F statistic		190.05	190.05	190.319
Stock and Yogo (2005) 10% maximal IV size (critical value)		16.38	16.38	16.38
Test of overidentifying restrictions				
Hansen's J-statistic		Exactly identified	Exactly identified	Exactly identified
p-value		0.000	0.000	0.000
Panel B: P_INDEX_2				
	P_INDEX_2	**Model 1**	**Model 2**	**Model 3**
Firm Age	-0.0429**			
	(-2.0783)			
P_INDEX_2		0.0656***	0.3178***	0.0904***
		(6.2245)	(3.1554)	(5.3916)
Corporate governance variables	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Constant	0.1539	0.9328***	3.5718***	1.4055***
	(0.2744)	(9.9085)	(3.9707)	(9.3794)
Observations	9,639	9,639	9,639	9,639
R-squared		0.1914	0.0354	0.1545
Underidentification test				
Kleibergen–Paap rk LM statistic		271.313	271.313	271.313
p-value		0.000	0.000	0.000
Weak identification test				
Corrected Cragg–Donald Wald F statistic		279.694	279.694	279.694
Stock and Yogo (2005) 10% maximal IV size (critical value)		16.38	16.38	16.38
Test of overidentifying restrictions				
Hansen's J-statistic		Exactly identified	Exactly identified	Exactly identified
p-value		0.000	0.000	0.000

This table presents the results of the two-stage least squares (2SLS) regression with cluster-robust standard errors between the three measures of cash holdings and the two CEO power indices (*P_INDEX_1* and *P_INDEX_2*). In first stage, we obtain the predicated value of the endogenous independent variable from regressing the endogenous independent variable on the instrumental variable. In second stage, we run our main models of the dependent variables on the exogenous independent variable and the predicated value obtained from the first stage regression in lieu of observations on the endogenous variables. We also include the year effect and industry effect in our regression model. Panel A of this table presents the 2SLS regression result between all measures of cash holdings and *P_INDEX_1*. Panel B of this table presents the 2SLS regression result between all measures of cash holdings and *P_INDEX_2*. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

2.7 Conclusion

Powerful CEOs, who have the ability to influence crucial decisions in their firms in the face of opposition, have a critical impact on the success, failure, and overall performance of firms. An empirical investigation into whether powerful CEOs hold onto high levels of cash holdings is particularly worthwhile given the critical role that cash or ready cash plays in any economy and capital markets globally. Although the prior literature examines the influence of other top executives, such as the chief financial officer's influence on corporate cash holdings, we believe that an examination of the CEO's role is more compelling given that the CEO is the most important decision maker in the firm and the person with whom the ultimate responsibility for executive decision-making rests, particularly over critical operations such as cash holdings.

Australia provides an ideal setting for our analysis given its less regulated setting which better reveal managerial choice decisions. In addition, given its similarities to other important markets such as the US, UK and the European Union in terms of capital markets, financial reporting practices and investor protection regimes, results from this setting is generalisable to other jurisdictions. Using a sample of 9,708 firm-year observations from 2001 through to 2015, we construct two CEO power indices that essentially capture most of the popular CEO power measures in the literature. We find a significant positive association between both CEO power indices and corporate cash holdings, indicating that powerful CEOs hold more cash than non-powerful CEOs. We also use alternative measures of cash holdings to substantiate our results and find consistent outcomes. Furthermore, we undertake a number of supplementary analyses, including lagged data and alternative control parameters, and we control for the GFC and our results continue to hold, including after completing substantial analyses of endogeneity concerns. Consequently, our empirical results have both scholarly and practical implications in terms of the literature on both CEO power and corporate cash holdings and firms' hiring of CEOs to align with the firm's corporate cash holdings strategy.

2.8 Appendices

Appendix A: Data definitions

Variables	Definition
Dependent	
Cash & Mkt Sec./Total Assets	Ratio of cash and marketable securities to total assets MS = QR X CL – CCE – AR MS = marketable securities QR = quick ratio CL = current liabilities CCE = cash and cash equivalent AR = accounts receivable
Cash & Mkt Sec./Net Assets	Ratio of cash and marketable securities to net assets where net assets = total assets – cash and marketable securities
Cash/Net Assets	Ratio of cash to net assets where net assets = total assets – total liabilities
Log (Cash/Net Assets)	Natural log of the ratio of cash to net assets
Cash & Mkt Sec./Lagged Net Assets	Ratio of cash and marketable securities to lagged net assets
Cash/Lagged Net Assets	Ratio of cash to lagged net assets
Independent	
CEO Duality	Dummy variable equal to 1 if the CEO is also the chairman of the board and 0 otherwise
CEO Tenure	Number of years the CEO has spent as the CEO in the firm
CEO Founder	Dummy variable equal to 1 if the CEO is a founder and 0 otherwise. The CEO is considered as a founder if he/she is in the role of CEO at the time of incorporation or joins within the one year after the firm's date of incorporation.
CEO Ownership	Percentage of CEO shares in the total outstanding shares of the firm
CEO Functional Experience	Dummy variable equal to 1 if the CEO has any prior experience in any industry or function of an organization before acting as CEO and 0 otherwise
Compensation Ratio (CompRatio)	Ratio of the CEO's total compensation to the total compensation of the top executive of the firm who receives the highest compensation after the CEO
CEO Remuneration	Ratio of the CEO's annual total compensation (including salary, bonus, and other benefits) to the total annual compensation received by all the directors on the board other than the CEO
CEO Bonus Pay	Dummy variable equal to 1 if the CEO receives a performance-related bonus and 0 otherwise
P_INDEX_1	Principal component from a principal component analysis based on the following variables: CEO Duality, CEO Tenure, CEO Founder, CEO Ownership, and CEO Functional Experience
P_INDEX_2	Principal component from a principal component analysis based on the following variables: Compensation Ratio (CompRatio), CEO Remuneration, and CEO Bonus Pay
Corporate Governance Characteristics	
CEO Gender	Dummy variable equal to 1 if the CEO is female and 0 otherwise
CEO Age	Natural log of the CEO age, where CEO age is the age of the CEO in years
Board Size	Number of members sitting on the board of directors
Interdependent Director	Number of interdependent directors divided by the total number of directors of the firm. Interdependent directors are those who are appointed by the CEO. A higher ratio of interdependent directors on the board refers to CEOs having greater power
Board Independence	Ratio of independent directors to total directors of the firm
Board Meetings	Total number of board meetings held during the year
Firm Characteristics	
Firm Size	Natural log of the book value of the total assets
ROE	Net income divided by the total shareholders' equity
Debt to Equity	Total debt divided by the total shareholders' equity
Market to Book	(the book value of assets minus the book value of equity plus the market value of equity) divided by the book value of assets
Dividend Pay	Dummy variable equal to 1 if the firm pays dividends and 0 otherwise
R&D/Total Assets	Research and development expenses divided by the total assets. Firms that do not report R&D expenses are considered to be firms with no R&D expenses
CAPEX	Natural log of capital expenditure defined as ratio of capital expenditure to total assets
WC/Total Revenue	Working capital divided by the total revenue
Cash Flow/Total Assets	Cash flow divided by the total assets
Cash Flow Volatility	Standard deviation of the firm's cash flow from operation scaled by the total assets over the prior three-year period
Industry_Dummy	Industry dummy according to the global industry classification standard
Year_Dummy	Year dummy according to the financial year end
ε	Error term

Appendix B: Ordinary least square (OLS)

Cash holdings and CEO power index (P_INDEX_1)

Variables	Cash & Mkt Sec./ Total Assets	Cash & Mkt Sec./ Net Assets	Cash/ Net Assets	Log (Cash/ Net Assets)	Cash & Mkt Sec./ Lagged Net Assets	Cash/ Lagged Net Assets
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
P_INDEX_1	0.0093***	0.0427**	0.0160***	0.0799***	0.1228***	0.1181***
	(3.9775)	(1.9790)	(4.1905)	(4.0281)	(4.4835)	(4.4620)
CEO Gender	0.0054	-0.1246	0.0370**	0.1032	-0.1951	-0.1861
	(0.4755)	(-1.1818)	(1.9883)	(1.0688)	(-1.4637)	(-1.4442)
CEO Age (Log)	-0.0302*	-0.0464	-0.0422*	-0.2048	-0.3969**	-0.4270**
	(-1.9512)	(-0.3238)	(-1.6723)	(-1.5567)	(-2.1739)	(-2.4193)
Board Size (Log)	0.0328***	0.1754***	0.0309***	0.3495***	0.1990**	0.1929**
	(4.5882)	(2.6512)	(2.6509)	(5.7479)	(2.3275)	(2.3340)
Interdependent Director (Log)	-0.0160***	-0.0510	-0.0209***	-0.1097***	-0.0726*	-0.0741*
	(-4.7628)	(-1.6435)	(-3.8194)	(-3.8457)	(-1.8159)	(-1.9163)
Board Independence	0.0227**	0.1307	0.0312**	0.2801***	0.0093	0.0266
	(2.4177)	(1.5051)	(2.0333)	(3.5096)	(0.0847)	(0.2494)
Board Meetings (Log)	0.0137***	0.0834**	0.0171***	0.1320***	-0.0477	-0.0416
	(3.7756)	(2.4727)	(2.8731)	(4.2576)	(-1.1050)	(-0.9970)
Firm Size (Log)	-0.0098***	0.0564***	-0.0086**	-0.1505***	0.1415***	0.1343***
	(-4.6696)	(2.8900)	(-2.4924)	(-8.3612)	(5.6375)	(5.5323)
ROE	-0.0168***	-0.0517**	-0.1125***	-0.1215***	0.0011	-0.0165
	(-7.2672)	(-2.4129)	(-29.7369)	(-6.1619)	(0.0418)	(-0.6207)
Debt to Equity	-0.0386***	-0.1098***	0.0523***	-0.3680***	-0.0660**	-0.0972***
	(-13.9623)	(-4.2856)	(11.5631)	(-15.5871)	(-2.0055)	(-3.0533)
Market to Book	0.0134***	0.0622***	0.0162***	0.1007***	0.0984***	0.0978***
	(16.4429)	(8.2698)	(12.1928)	(14.4519)	(10.1583)	(10.4435)
Dividend Pay	-0.0201***	0.0096	-0.0067	-0.2155***	-0.2340***	-0.2299***
	(-3.8776)	(0.1996)	(-0.7874)	(-4.8860)	(-3.8173)	(-3.8789)
R&D/Total Assets	-0.0231**	-0.2614***	0.0051	-0.0835	-0.2654**	-0.2651**
	(-2.2010)	(-2.6864)	(0.2982)	(-0.9366)	(-2.1567)	(-2.2281)
CAPEX (Log)	-0.0139***	-0.1641***	-0.0177***	-0.0512***	-0.1611***	-0.1517***
	(-10.3114)	(-13.1647)	(-8.0690)	(-4.4759)	(-10.0888)	(-9.8242)
WC/Total Revenue	-0.0040***	-0.0331***	-0.0064***	-0.0312***	-0.0804***	-0.0825***
	(-5.5737)	(-5.0223)	(-5.5421)	(-5.1711)	(-9.4472)	(-10.0228)
Cash Flow/Total Assets	-0.0259***	-1.0857***	0.1681***	0.2281***	-0.1727	-0.1559
	(-2.6051)	(-11.7725)	(10.3324)	(2.6874)	(-1.4518)	(-1.3558)
Cash Flow Volatility	0.1921***	1.4632***	0.3482***	1.6124***	4.4589***	4.1358***
	(10.3741)	(8.5309)	(11.5106)	(10.2575)	(20.1643)	(19.3438)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.5880***	1.4582**	0.6791***	0.9421*	1.1779	1.3148*
	(9.0673)	(2.4272)	(6.4073)	(1.7080)	(1.5617)	(1.8029)
Observations	9,708	9,708	9,707	9,654	9,128	9,128
R-squared	0.3280	0.2066	0.2568	0.2861	0.1970	0.1965

This table reports the result of pooled ordinary least square (OLS) regression of three measures of cash holdings used in the main analysis and three alternative measure of cash holdings with CEO power index (*P_INDEX_1*) reported in Eq. (1). This study includes all firms listed on the ASX for the observation period 2001 to 2015 except financial intuitions, banks and insurance companies (for details, see section 3.1). The sample consists of 9708 firm-year observations. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Appendix C: Ordinary least square (OLS)

Cash holdings and CEO power index (P_INDEX_2)

Variables	Cash & Mkt Sec./ Total Assets	Cash & Mkt Sec./ Net Assets	Cash/ Net Assets	Log (Cash/ Net Assets)	Cash & Mkt Sec./ Lagged Net Assets	Cash/ Lagged Net Assets
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
P_INDEX_2	0.0041**	0.0555***	0.0068**	0.0334*	0.0423*	0.0445*
	(2.0159)	(2.9496)	(2.0381)	(1.9300)	(1.7494)	(1.9011)
CEO Gender	0.0046	-0.1301	0.0355*	0.0959	-0.1338	-0.1246
	(0.4002)	(-1.2349)	(1.9087)	(0.9925)	(-0.9958)	(-0.9587)
CEO Age (Log)	-0.0262*	-0.0267	-0.0354	-0.1702	-0.1508	-0.1839
	(-1.6984)	(-0.1868)	(-1.4050)	(-1.2954)	(-0.8287)	(-1.0447)
Board Size (Log)	0.0258***	0.1550**	0.0189*	0.2887***	0.1404*	0.1395*
	(3.7572)	(2.4385)	(1.6802)	(4.9382)	(1.7038)	(1.7502)
Interdependent Director (Log)	-0.0090***	-0.0214	-0.0089*	-0.0497**	0.0231	0.0175
	(-3.1937)	(-0.8182)	(-1.9392)	(-2.0692)	(0.6803)	(0.5338)
Board Independence	0.0195**	0.1009	0.0258*	0.2536***	0.1235	0.1377
	(2.0708)	(1.1575)	(1.6771)	(3.1656)	(1.1100)	(1.2794)
Board Meetings (Log)	0.0128***	0.0775**	0.0156***	0.1245***	-0.0648	-0.0577
	(3.5304)	(2.3021)	(2.6155)	(4.0150)	(-1.4989)	(-1.3789)
Firm Size (Log)	-0.0108***	0.0495**	-0.0102***	-0.1584***	0.1430***	0.1360***
	(-5.1170)	(2.5375)	(-2.9575)	(-8.8056)	(5.6602)	(5.5684)
ROE	-0.0168***	-0.0518**	-0.1124***	-0.1214***	-0.0113	-0.0282
	(-7.2599)	(-2.4160)	(-29.7133)	(-6.1546)	(-0.4066)	(-1.0538)
Debt to Equity	-0.0386***	-0.1088***	0.0523***	-0.3681***	-0.1121***	-0.1415***
	(-13.9502)	(-4.2449)	(11.5525)	(-15.5788)	(-3.4216)	(-4.4643)
Market to Book	0.0136***	0.0630***	0.0166***	0.1026***	0.1080***	0.1069***
	(16.7457)	(8.3989)	(12.5009)	(14.7537)	(11.1305)	(11.3980)
Dividend Pay	-0.0187***	0.0136	-0.0043	-0.2037***	-0.3960***	-0.3860***
	(-3.6188)	(0.2847)	(-0.5047)	(-4.6291)	(-6.8035)	(-6.8559)
R&D/Total Assets	-0.0221**	-0.2540***	0.0068	-0.0749	-0.2609**	-0.2602**
	(-2.1030)	(-2.6114)	(0.3988)	(-0.8396)	(-2.1118)	(-2.1778)
CAPEX (Log)	-0.0137***	-0.1636***	-0.0175***	-0.0500***	-0.1574***	-0.1487***
	(-10.2048)	(-13.1311)	(-7.9552)	(-4.3677)	(-10.2206)	(-9.9801)
WC/Total Revenue	-0.0040***	-0.0331***	-0.0065***	-0.0315***	-0.0843***	-0.0863***
	(-5.6066)	(-5.0331)	(-5.5769)	(-5.2091)	(-9.8779)	(-10.4558)
Cash Flow/Total Assets	-0.0234**	-1.0763***	0.1724***	0.2497***	-0.3345***	-0.3179***
	(-2.3592)	(-11.6999)	(10.6131)	(2.9468)	(-2.8216)	(-2.7718)
Cash Flow Volatility	0.1890***	1.4416***	0.3429***	1.5859***	4.2786***	3.9580***
	(10.2022)	(8.4089)	(11.3303)	(10.0851)	(19.1726)	(18.3374)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.5792***	1.4387**	0.6635***	0.8614	0.2858	0.4327
	(8.9323)	(2.3973)	(6.2614)	(1.5619)	(0.3815)	(0.5972)
Observations	9,708	9,708	9,707	9,654	9,128	9,128
R-squared	0.3272	0.2070	0.2557	0.2852	0.1778	0.1767

This table reports the result of pooled ordinary least square (OLS) regression of three measures of cash holdings used in the main analysis and three alternative measure of cash holdings with CEO power index (*P_INDEX_2*) reported in Eq. (2). This study includes all firms listed on the ASX for the observation period 2001 to 2015 except financial intuitions, banks and insurance companies (for details, see section 3.1). The sample consists of 9708 firm-year observations. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

CHAPTER 3

Outsider CEOs and cash holdings: What's going on?*

3.1 Introduction

When recruiting a new chief executive officer (CEO), a firm has two options: appointing someone from outside the firm who brings new knowledge, wider experience, an established external network, and a novel perspective to govern the firm or promoting someone from inside the firm who already possesses firm-specific knowledge, detailed knowledge about the firm's existing policies, and experience of implementing such policy at a lower cost. The article entitled "The rise of the outsider CEO" by forbes.com highlights CEO succession statistics in recent years and presents reasons for the rising trend of appointing outsider CEOs in the largest firms. It reports that, in recent years, firms have increasingly chosen an outsider CEO deliberately rather than an internal planned succession.[18]

Discontinuous change is one reason to appoint an external CEO for many companies. Industries like energy and telecommunications are shifting their business model from asset-intensive to a consumer-intensive business model. Utilities and financial industries are experiencing and adapting new policies imposed by regulatory authorities. Overall, companies from almost all sectors are rethinking their business model with the advent of digitalization. To combat the new challenges faced by the companies, the board of directors often look for a CEO outside the company to succeed during the transformation process.[19] The second reason for the increasing CEO outsider trend is a change in the corporate governance structure and leadership style of companies. Due to regulatory reforms after the post-2000 corporate governance

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[18] The article also summarizes a study conducted on incoming CEOs at the largest 2,500 public companies from 2004 to 2015 by Strategy&, PwC's strategy consulting business, as part of the 2015 CEO Success study and reports that corporate boards recruited outsider CEOs in 22% of planned successions from 2012 to 2015, an increase from 14% in 2004 to 2007 (for details, see https://www.forbes.com/sites/strategyand/2016/04/19/the-rise-of-the-outsider-ceo/#305737064a56).

[19] The article also reports from 2012 to 2015 in telecommunication industries 38% CEOs are appointed from outside. Utility industry is the next highest share which is 32%, followed by healthcare 29%, energy 28%, and financial services and consumer staples both are 26%.

scandals, corporate boards are becoming more independent in recent years. Therefore, board independence brings more diversity and considers a CEO candidate from a broader aperture. By contrast, in the past, the less diversified board was largely unable to imagine that an external CEO could better manage the business. The other reason for the increasing trend towards board independence is increasing shareholder activism.[20] Consequently, companies anticipating these challenges may require a leader who possesses wider experience, broader knowledge, and a different way of running the business from the existing executives in the management team. Even though internal CEO candidates may have a good record for past and present performance, corporate boards may feel that they lack the skills and experience to lead the inevitable transformation process. Consequently, to implement the firm's policy, CEO choice is a vital decision for the smooth operations of a firm (Kesner & Sebora, 1994). One of the keys to the success of a firm depends largely on the right choice of CEO. Due to the increasing competitiveness in the world marketplace, the selection of the right CEO has received special attention in recent years (Lam et al., 2013; Schrand & Zechman, 2012).

Perhaps as a consequence of this recent scenario, researchers exhibit significant interest in investigating how a newly appointed CEO, that is, an outsider CEO, deals with the strategic plan of the organization (Zhang & Rajagopalan, 2010). In fact, corporate financing policy is one of the important strategic areas of an organization, and the CEO is the person who takes the ultimate decision on it (Huang, Tan, & Faff, 2016; Pan, Wang, & Weisbach, 2016). Therefore, effective corporate financing decisions taken by the CEO may positively affect the performance of the firm and increase its competitiveness in the marketplace (Herrmann & Datta, 2002).

Among the areas that CEOs have to formulate the corporate financial policy is cash holdings (Ferreira & Vilela, 2004; Harford et al., 2008; Jiang & Lie, 2016; Opler et al., 1999). Cash is the most liquid asset on firms' balance sheet, significant in formulating their financial policy, attracting substantial attention from shareholders,

[20] Since the 1990s, institutional owners, for example, firms managing pension funds and hedge funds have become more active and perform as a positive force for shareholder activism. Activist Insight reports in 2015, 551 companies around the world were subjected to public demands by activists, up 16 percent from 2014. Almost half the companies at which an activist investor gains a board seat replace their CEOs within 18 months

investors, capital market analysts, and corporate boards (Subramaniam et al., 2011). Cash is an important consideration both in a recession and in economic prosperity. The liquidity crisis, the major concern when the global recession started in late 2007, had a substantial and long-term impact on the way many firms operate. As such, firms that maintain a buffer of cash during periods of a credit crunch can avoid resorting to costly and scarce funds from the debt market (Subramaniam et al., 2011). On the other hand, in times of economic prosperity and expansion, CEOs need to choose strategically whether to increase the cash reserves, disburse the cash as a dividend, spend internally to acquire capital goods/seize investment opportunities, or use cash for external acquisition (Harford et al., 2008). Therefore, the corporate finance literature continues the debate on the determinants of cash holdings, and it is still not theoretically clear how CEOs choose between stockpiling cash reserves and spending surplus cash.

The appointment of outsider CEOs has an important implication for firms' policy formulation (Zhang & Rajagopalan, 2003). Hence, one of the important motivations of this study is to examine the relationship between outsider CEOs and corporate cash holdings, an area yet to be investigated. Outsider CEOs may choose either to spend the cash reserve or to stockpile the cash. Accordingly, this paper investigates how CEOs implement their cash-holding strategy.

Most recent studies in the cash-holding literature examine the impact of overconfident CEOs on the value of corporate cash holdings (Aktas et al., 2019). Florackis and Sainani (2018) investigate the influence of chief financial officers on corporate cash holdings. Jiang and Lie (2016) provide evidence regarding the adjustment of cash reserves when they fall below the optimal levels. Liu et al. (2014) report the relationship of CEO inside debt and corporate cash holdings. Steijvers and Niskanen (2013) investigate the determinants of cash holdings in private firms, and Subramaniam et al. (2011) study firms' structure and cash holdings. On the other hand, most CEO succession literature investigates CEO turnover and outside succession (Parrino, 1997); the internal versus external CEO choice and compensation contracts (Palomino & Peyrache, 2013); the network effect of outside options and CEO turnover (Liu, 2014); insider versus outsider CEOs' compensation and accounting manipulation (Jongjaroenkamol & Laux, 2017); CEO origin and accrual-based earnings management (Kuang, Qin, & Wielhouwer, 2014); determinants of CEO compensation from generalist–specialist to insider–outsider attributes (Brockman, Lee, & Salas,

2016); and so on. Henceforth, our paper investigates an overlooked but important relationship between outsider CEOs and corporate cash holdings. The degree of CEOs' influence can direct corporate cash holdings in either positive or negative ways, as extreme decisions may be taken when outsider CEOs take the helm.

We examine empirically the relationship between outsider CEOs and corporate cash holdings using a sample of 9,609 firm-year observations from 2001 to 2015 listed under Australian Securities Exchange (ASX). We choose the Australian economy to investigate the aforesaid relationship because Australia is considered as one of the most robust economies with a significant impact on the world economy in 2019 (Australian Trade Commission, 2019, January). The Australian Trade and Investment Commission's (Austrade) *Benchmark Report 2019* provides statistical evidence that Australia is the only major country among the developed countries to have faced no annual recessions from 1992 to 2018, and its average annual growth was 3.2% during the period. Moreover, the International Monetary Fund (2019), in its latest assessment, forecasts that Australia's real GDP will grow by an average rate of 2.7% per year from 2020 to 2024, giving Australia the highest GDP growth among the major developed economies. Yet more important features of the Australian financial system are its imputation dividend policy (Cannavan, Finn, & Gray, 2004) and the fact that its financial system is largely service based, with service sectors constituting the largest part of the Australian economy, accounting for 75% of employment and 70% of the GDP. The Australian corporate governance regulations are also different from those in the US (Anand, 2005; Coulton & Ruddock, 2011; Sultana, Singh, & Rahman, 2019). Australia, along with 13 other countries, falls into the group of countries where corporate governance guidelines are voluntary but the disclosure of governance practices is mandatory. On the other hand, the US belongs to the group in which governance practices and disclosures are both mandatory. As a result, the Australian economy's resilience is sustained by a robust policy framework, strong institutions, a healthy fiscal position of the government, and a sophisticated financial system. Therefore, results from our investigation can be used as a reference for other developed economies.

One of the methodological novelties of this paper is the use of a generalized least square (GLS) and simultaneous quantile regression (SQR) estimator to examine and obtain a robust picture of the relationship between outsider CEOs and corporate

cash holdings. Following Baltagi and Chang (1994) and Zhang and Rajagopalan (2010), we use the GLS estimator as the main model throughout the study, because, to address potential first-order autoregressive (AR(1)) disturbances within unbalanced panels and correct for cross-sectional correlation and/or heteroscedasticity across panels, the GLS technique is more robust. Furthermore, we observe that the distributions of the dependent variable "cash holdings" are dispersed, so greater efficiency can be achieved by using a GLS over an ordinary least square (OLS) estimator, as suggested by Greene (2018). Standard linear regression summarizes the result of any relationship focusing on the conditional mean function and not take into account the distance from the lower percentile to the higher percentile of the distribution of cash holdings. As such, we also employ SQR to capture the impact of an outsider CEO at different levels of cash holdings to gain a complete picture of the relationship, as suggested by Cameron and Trivedi (2010).[21]

The main model of our study, that is, GLS, shows a strong negative relation between outsider CEOs and cash holdings, indicating that firms with outsider CEOs hold lower cash. Second, as GLS focuses only on the central tendency of the distribution of the sample, we apply SQR to capture the impact of the independent variables at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth quantiles of cash holdings. Outsider CEOs are consistently associated negatively at all quantiles except the tenth quantile. The coefficient of cash holdings increases consistently from lower to higher quantiles, meaning that the impact of outsider CEOs is significantly higher in firms with high cash holdings than in firms with low cash holdings.

Third, the negative association using both the GLS and the SQR estimators trigger a number of secondary questions. Do outsider CEOs follow operational considerations of cash holdings or an agency perspective for cash adjustment or both?[22] To examine the operational considerations of cash holdings, we replace our dependent variable with CAPEX and rerun the GLS regression. We find a strong positive relation between outsider CEOs and CAPEX in year ($t+1$). A likely

[21] The empirical distribution of this study shows that "cash holdings" are significantly skewed to the right, indicating a long right tail and departing from normality. As a result, it provides the justification for and efficiency of using quantile regression (Kuan, Li, & Liu, 2012; Mata & Machado, 1996) (see section 4.1 for details).
[22] See further details in section 4.3.2.

explanation for this result is that outsider CEOs reduce cash holdings during the year of their appointment and increase the capital expenditure in the subsequent year to develop better investment opportunities. This enables them to provide existing management as well as shareholders with evidence to support their skill, knowledge, experience, and external connections to improve the firms' strategic policy change, leading to the creation of positive value for the firm. This latter act may be to justify their appointment at the firm.

Fourth, as prior research (Kuang et al., 2014) argues that outsider CEOs can behave differently in the long run and may adopt decisions that favour their own empire-building and compromise shareholders' best interests, we subsequently replace our independent variable with a dummy variable for outsider CEOs who stay with a firm for five years or more and new regression results show a significant positive association between outsider CEOs with equal to or more than five years' tenure and cash holdings, supporting the prior literature confirming the agency perspective of cash holdings.

Finally, within the agency theory framework, outsider CEOs may increase cash reserves in the long run to secure personal benefits by using dividends[23] to tunnel the cash. Therefore, we replace our dependent variable with dividend paid and results indicate a strong positive relation between outsider CEOs with equal to or more than five years' tenure and dividend pay in year ($t+5$), confirming our tunnelling conjecture under the principal–agent relationship.

Subsequently, to mitigate the selection bias of our cash holdings measure and to confirm the robustness of our results, we use three alternative measures of cash holdings and find that the alternative measures validate our main analysis. Additionally, we consider the insider CEO perspective as an additional test to check and confirm whether insider CEOs behave differently from outsider CEOs. Using all alternative measures of cash holdings, we find a statistically significant and positive relation between insider CEOs and cash holdings. As the prior literature on CEOs' origin and characteristics (Baik, Farber, & Lee, 2011; Brockman et al., 2016; Custódio

[23] Chen et al. (2009) identify dividends as a tool for tunneling.

& Metzger, 2014; Kaplan et al., 2012; Kuang et al., 2014; Parrino, 1997; Zhang & Rajagopalan, 2010) indicates that CEOs may behave differently due to their previous experience, ability, and expertise, we also empirically test the influence of CEO outsider–insider attributes from generalist to specialist perspectives on corporate cash holdings. The result shows that both generalist and specialist outsider CEOs reduce cash reserves, but the rate of reduction is higher for generalist outsider CEOs than for specialist outsider CEO. On the other hand, insider CEOs, irrespective of generalist and specialist attributes, increase cash reverses.

We use four econometric techniques, specifically two-stage least squares (2SLS), propensity score matching (PSM), the two-step system generalized method of moments (GMM), and difference-in-differences (DID), to confirm that the statistical significance, sign, and magnitude of all our tests are not biased due to endogeneity. We find that our additional econometric analyses confirm the findings from our main models, that there is a negative association between outsider CEOs and corporate cash holdings, indicating that outsider CEOs hold less cash.

Our paper makes several contributions. We extend the literature on outsider CEOs by examining how such outsider CEOs manage cash holdings during their tenure at a firm. We show, in the first instance, that outsider CEOs, secure in their external reputations, choose to maintain lower cash holdings. Interestingly, we find that, in the year after their appointment, such outsider CEOs tunnel surplus cash into capital expenditure projects before tunnelling cash back to dividend payouts prior to their departure from firms. Such an understanding of outsider CEO actions and underlying incentives is of significant interest and importance to a wide variety of capital market participants particularly given the significant increase in outsider CEO appointments. Such findings are relevant to boards of firms when making CEO change decisions; whether to hire an internal or external CEO and the likely actions of an outsider CEO when dealing with the cash holdings of the firm and the suitability of such an approach to the strategic directions of the firm. Regulators may be able to use our results to understand the incentives of outsider CEOs during the life cycle of the CEO with a firm and whether regulatory intervention is appropriate to monitor or moderate CEO cash rewards towards the end of their departure from firms. Such regulatory intervention could include strengthening the monitoring oversight responsibilities of audit committees. Investors are also better able to understand

outsider CEO behaviour and actions when first appointed to firms and how such behaviour changes towards the departure term of the CEO. This awareness will assist investors understand the basis behind the operational decisions of the outsider CEO towards cash and more importantly, dividend payouts, the latter a critical factor for investors when determining investment decisions. Finally, we also contribute to the debate on the merits of insider and outsider CEO appointment decisions and the literature on the life cycle of a CEO. In terms of our research design, we combine both GLS and SQR estimators to examine the relationship between outsider CEOs and cash holdings thereby not only focusing on the conditional mean function but also scrutinising the relationship at different levels of cash holding distributions making our results and conclusions more robust than prior studies.

The remainder of the paper proceeds as follows. Section 2 describes the related literature and theoretical framework. Section 3 provides an insight into the sample collection and the construction of the variables. Section 4 reports the empirical results. Section 5 provides the results of several robustness checks, more evidence, and an explanation for our main findings. Section 6 provides details regarding how the study deals with the endogeneity concern. Section 7 concludes the study.

3.2 Literature review and theoretical framework

3.2.1 CEO outsider

CEO turnover is a common phenomenon in an organization, and prior studies show an increasing trend of outsider CEO appointment than insider CEO appointment through internal promotion (Mark R Huson, Robert Parrino, & Laura T Starks, 2001; Palomino & Peyrache, 2013).[24] Without placing a limit on CEO vacancies from internal sources, nowadays boards of directors look to appoint CEOs from beyond the organizational boundaries (Kuang et al., 2014). Consequently, corporate boards always face a trade-off between two available options: should the organization opt for

[24] Mark R Huson et al. (2001) provide evidence using US data that, in the 1970s, 15.3% of the newly appointed CEOs came from external sources, whereas, in the 1990s, 30% of the newly appointed CEOs came from external sources. In this study, 1487 cases of CEO turnover have taken place, according to Australian data from 2001 to 2015, of which 37.46% of the newly appointed CEOs came from external sources.

an external applicant for a new CEO appointment or promote someone from inside the organization (Jongjaroenkamol & Laux, 2017). Jongjaroenkamol and Laux (2017) argue that an outside search is an important source of new CEOs, because outsider CEOs bring new ideas, knowledge, and novel perspectives and are more adaptive to the changing environment. On the other hand, outsider CEOs are considered to be risky compared with internal CEOs, because corporate boards have less information regarding their strengths and managerial abilities. Additionally, they have less firm-specific knowledge (Jongjaroenkamol & Laux, 2017).

Pfeffer and Salancik (2003) explain that an organization's existence in the long run depends on its capacity to obtain resources and maintain their flow. Typically, an organization conducts business in an environment in which it is not self-sufficient. Therefore, it needs to acquire resources from different sources when needed. From that perspective, outsider CEOs are considered as resources by themselves as well as acting as a bridge for other important resources for firms. The "upper-echelons perspective" also assumes similar benefits from recruiting outside CEOs and confirms that the organizational performance can partly be predicted from the background characteristics of CEOs (Hambrick & Mason, 1984). However, Parrino (1997) suggests that insider CEOs spend a considerable period of their career in the firm. As a result, they possess more firm-specific knowledge and detailed knowledge of the firm's current policies than their outside counterparts and are acquainted with the policy implementation process at the lower level. In contrast, outsider CEOs bring versatility, different experience, boarder exposure, a wider network, a different leadership style to initiate policy changes, and alternative ways of managing the firm by implementing those policies. Therefore, the attractiveness of recruiting outside CEOs is greater in those firms that demand policy change and implementation. Subsequently, Parrino (1997) concludes that firms that are suffering from poor performance recruit outsider CEOs because they need a new direction that outsider CEOs are assumed to bring to amplify their performance.

Outsider CEOs are considered as a change maker and can implement the strategic change of an organization more quickly than insider CEOs. Zhang and Rajagopalan (2003) identify several benefits of outsider CEO appointment. First, outsider CEOs bring different managerial skills from their previous experience, which they can apply in their new position to achieve a better operating performance. Second,

outsider CEOs bring opportunities for different organizational learning scopes. Their new ideas, skills, and experience from the same industry or different industries help the existing employees of the organization to cope with the changing environment and increase their adaptation capability. Therefore, they make the organization more robust to the ever-changing external business environment. Third, due to the nature of their outsiderness, experience, and connections, outsider CEOs can search more broadly for opportunities inside and outside the organization. Therefore, changes in the organizational policy, such as the financial policy and investment policy, may be much more adaptive under the leadership of outsider CEOs than insider CEOs. Moreover, most outsider CEOs have industry experience or special skills (Parrino, 1997). Consequently, appointing outsider CEOs with industry experience or special skills may reduce the likelihood of committing a costly mistake.

In another study on CEOs' external directorate networks, Geletkanycz, Boyd, and Finkelstein (2001) argue that CEOs' external network ties offer numerous benefits to firms, as they have strategic value. First, CEOs' external network linkage helps to lessens the uncertainty that may arise from external resource dependency (e.g., (Pfeffer & Salancik, 2003). Moreover, CEOs may use these strategic advantages to secure capital or external funds on more favourable terms (Mizruchi & Stearns, 1994). Second, the external network of CEOs gives them the opportunity to access external strategic information on a greater scale and more quickly. Additionally, because of their access to the wider environment, CEOs can obtain information regarding the recent trends quickly, and their external linkage can produce the external support required for the proper functioning of the firms. This information is very important to fortify the firms against future contingencies. Therefore, firms may decide to recruit people who have this vital external linkage to gain access to the above-mentioned benefits.

3.2.2 Cash holdings

The optimum allocation and adjustment of internal funds is an important decision in corporate finance and therefore has attracted significant research interest in the last couple of decades (Aktas et al., 2019; Almeida, Campello, & Weisbach, 2004; Bates et al., 2009; Jensen, 1986; Liu & Mauer, 2011; Opler et al., 1999). Adjustment of the internal fund to determine the optimal level of cash holdings leads

the top management of the organization to the corporate financing decision dilemma regarding whether to spend internally or to disburse the cash to the shareholders (Harford et al., 2012). Consequently, CEOs would like to decide between the alternatives available, which is, accumulating cash, perceiving difficulties in obtaining funding from external financing at the time of necessity, and spending cash to grasp an investment opportunity or increase the capital expenditure. As the leader of the top management team, how CEOs deal with this dilemma is still unclear.

The prior studies by Kim, Mauer, and Sherman (1998) and Opler et al. (1999) provide evidence that firms retain a cash reserve to overcome the uncertainty that may arise due to the scarcity of external financing opportunities. It is also evident in those studies that smaller firms with highly volatile cash flows, greater information asymmetry, and higher growth potential hold more cash whereas larger firms with a connection or easy access to an external source of funds keep less cash. Denis and Sibilkov (2010) extend this literature by examining the relationship between financial constraints and cash holdings and find that financially constrained firms hoard more cash than unconstrained firms or firms that have easy access to the external debt market. Moreover, financially unconstrained firms can raise external capital and use this external fund to meet their investment needs and necessary expenditure. Taking advantage of less expensive external financing opportunities, financially unconstrained firms exhibit significantly lower cash reserves and spend their available cash on investment projects or capital expenditure. However, Harford et al. (2008) find strong evidence that firms with a weak governance structure keep less cash. On the other hand, Dittmar and Mahrt-Smith (2007) explain that the corporate governance structure mainly focuses on how firms spend cash reserves rather than how they accumulate cash reserves. This study also suggests that firms with a good corporate governance structure can protect and utilize their cash resources in an efficient way, whereas poorly governed firms misuse their buffer cash more quickly. Similarly, firms with excess cash significantly reduce their cash reserves if they are poorly governed and therefore experience poor operating performance and vice versa (Dittmar & Mahrt-Smith, 2007). Hence, the result of this study indicates that top executives like CEOs either reduce the cash reserve inefficiently by investing in lower-NPV projects due to the agency conflict or hold excess cash, making the CEO relaxed, which subsequently affects internal control mechanisms, like achieving operating efficiency

by decreasing costs, improving margins, and carefully monitoring employees, and other activities leading to higher firm performance. Though excess cash may lead to suboptimal organizational performance, the presence of a strong governance structure can cancel out this effect.

The existing hypothesis of cash holdings explains that managers would like to adjust firms' cash holdings to achieve personal benefit. Managers intrinsically hoard surplus cash due to their risk avoidance tendency or want to secure more flexibility to pursue personal benefit (Opler et al., 1999). Moreover, without an external influence to maximize shareholders' wealth, managers may be indifferent towards making timely disbursements of cash, which also affects the corporate cash adjustment process, as identified by Opler et al. (1999). Similarly, Jensen (1986) reports that self-interested managers tend to spend cash inefficiently, because they believe that they can gain personal benefit even though the project may generate negative net present value. Therefore, these managers are inclined to expend any surplus cash either on investment or on capital expenditure in lieu of saving it. Likewise, Harford et al. (2008) argue that CEOs of ensconced firms prefer not to accumulate cash, because such accumulation can draw undesirable attention from active shareholders. Subsequently, this study provides evidence that ensconced firms are willing to spend surplus cash through capital expenditure and acquisitions. Similarly, Dittmar and Mahrt-Smith (2007) find that ensconced firms, as measured using the GIM index of Gompers, Ishii, and Metrick (2003), lessen surplus cash more quickly than strongly governed firms.

Additionally, cash holdings can be an important source of funds to mitigate companies' investment needs and demand for capital when other sources of funds are not sufficient or companies have difficulties in accessing external sources of funds. Denis and Sibilkov (2010) report that firms with limited access to the external capital market or difficulties in obtaining funding from external financing can use their cash holding reserve to fund their investment and required expenditure. Consistent with the prior literature, it is argued that firms have a tendency to accumulate more cash if their management perceives greater difficulties in obtaining external financing (Harford, 1999; Opler et al., 1999). Likewise, Almeida et al. (2004) examine the cash flow sensitivity of cash by adopting an alternative approach to answer the question of whether costly external sources of funds affect corporate financing decisions and finally find that firms facing greater difficulties in raising external financing save

larger portions of their cash inflows than those with lesser difficulties. In line with the view of costly external sources of funds, Faulkender and Rong (2006) investigate the relationship between the corporate financial policy and the value of cash and find that firms with larger cash holdings, higher leverage, and better access to the external financial market experience a declining marginal value of cash. Consequently, those firms reduce their cash balance by increasing their dividend payouts rather than making share repurchases.

3.2.3 Theoretical framework

This study adopts trade-off theory to explain the cash-holding dynamism of organizations and agency theory to explain the principal–agent relationship within firms (Jensen, 1986; Jensen & Meckling, 1976; Kuan et al., 2012; Opler et al., 1999). Trade-off theory asserts that firms' optimal level of cash holdings has been set by the marginal benefit and cost of holding cash assets. There are several reasons for adjusting the cash holdings in an organization. First, cash holdings act as a safeguard for firms in times of necessity, when there is an unexpected loss or difficulties involved in obtaining external financing. Second, cash holdings help firms to carry out their optimal investment policy regardless of any financial constraints. On the other hand, external funds or difficulties in accessing the external capital market will pressure firms not to invest in projects with a positive NPV.[25] Finally, if firms have difficulties in accessing the external financial market to raise funds when necessary and need to incur extra costs, they hold cash or increase their cash reserve.

Surplus cash holdings allow firms to minimize their transaction cost or reduce the likelihood of liquidating existing assets, because surplus cash acts as a buffer between the sources of funds and the use of funds. Kuan et al. (2012) also adopt the trade-off theory of cash holdings and argue that firms keep cash for two reasons: transaction and precaution. The transaction cost motive of cash holdings suggests that

[25] Ferreira and Vilela (2004) explain corporate liquidity theory as follows: the optimal level of cash holdings or corporate liquidity depends on firms' ability to raise external funds or access the external capital market and the opportunity for future investment. This model assumes that financially constrained firms will increase their cash holdings by a fraction of their incremental cash flow, whereas unconstrained firms will opt for external financing if required because of their easy access to external sources of funds.

firms that assume a higher transaction cost to raise external funds keep more cash (Keynes, 1936). Precautionary motives suggest that firms hold cash to reduce the likelihood of adverse financial shocks when accessing the external capital market is difficult and costly. On the basis of the transaction and precaution view of cash holdings, firms amass cash to meet sudden contingencies if the cost of other means of financing is very high (Han & Qiu, 2007).

Agency theory suggests that managers would like to accumulate cash if they prefer flexibility so that they can implement their personal agenda to secure their benefit (Opler et al., 1999). However, these managers therefore take actions to overcome the situation if the firms suffer from a dearth of cash reserves, which poses an impediment to the achievement of their empire-building objective. From the agency theory framework, Huang, Jiang, Liu, and Zhang (2011) argue that CEOs of firms with a surplus cash flow can spend the cash inefficiently for the purpose of personal empire building. Therefore, the acuteness of the agency conflict may influence the relative strength of investment sensitivity to the cash flow and can jeopardize the investment decision choice (Huang et al., 2011). However, Dittmar, Mahrt-Smith, and Servaes (2003) also investigate the relationship between corporate cash holdings and corporate governance from an international perspective using a sample of 11,000 firms over 45 countries. This study suggests that agency conflict is an important form of managerial discretion explaining corporate cash holdings and provides evidence that firms operating in countries with weak shareholder protection rights hold up to twice as much cash as firms operating in countries with strong shareholder protection rights. Additionally, based on the shareholder protection rights in different countries, Dittmar et al. (2003) find that firms hold a larger cash balance when access to a source of fund is easier. In a different study, Tong (2010) considers cash holdings as a source of investment as well as a source of financing and argues that cash holdings are viewed as a less risky project and a negative NPV project[26] from the investment point of view. Therefore, he reports that risk-averse CEOs prefer to keep more cash to diminish the

[26] Opler et al. (1999) argue that interest received from holding cash balances is subject to double taxation. Consequently, cash holdings are treated as assets earning negative NPV.

organizational risk even though their decision may forgo shareholders' best interest and identifies this situation as a risk-related agency problem.

Outsider CEOs are considered as valuable resources of the organization because of their education, broader experience, and wider external connection, which firms may not possess before their appointment (Zhang & Rajagopalan, 2010). Furthermore, outsider CEOs can operate firms in different ways, which can increase the professionalism of the firms. Subsequently, this may provide a signal to the external capital market indicating a low shareholder and debtholder agency concern. As a result, outsider CEOs may use the existing cash reserve to finance the corporate spending on such capital expenditure and investment in new projects because of the anticipation of the availability of an external source of funds either from debt or from equity.

Kuang et al. (2014) argue that, to build confidence and establish justification for their appointment, outsider CEOs tend to exert their leadership skills by implementing some policy changes at the beginning of their appointment to obtain some quick operational performance compared with insider CEOs. Additionally, outsider CEOs are more interested in exhibiting their expertise as soon as possible rather than preserving it for use in later years of their tenure, because they may assume that, in the long run, they may seek another external appointment. Moreover, due to the lack of detailed information, the board of directors may overestimate outsider applicants' abilities during the selection process. Consistent with this, Shen and Cannella (2002) argue that, though outsider CEOs have a strong desire to exhibit their abilities quickly after their appointment to achieve better performance in the short run, outsider CEOs have an expectation of lower tenure than insider CEOs. Therefore, outsider CEOs may consider this appointment as an opportunity to develop their career for the next lucrative appointment. Consequently, if outsider CEOs have an expectation not to stay in the firm in the long term, they can behave differently (Kuang et al., 2014) and may take decisions that compromise shareholders' best interest to secure their own personal benefit.

3.3 Sample collection and construction of variables

3.3.1 Data sources

We collect data primarily from two sources. All the corporate governance data, such as board and CEO characteristics and data related to CEO outsiders, are collected from the Securities Industry Research Centre of Asia-Pacific (SIRCA). Data related to the dependent variables and all the other financial data related to control variables are obtained from Morning Star (DatAnalysis). Following La Porta et al. (2002) and Matsumoto (2002), this study excludes financial institutions, banks, and insurance companies due to their unique regulatory framework. We examine all firms listed on the ASX for the observation period 2001 to 2015. The reason for starting our sample in 2001 is that SIRCA started its coverage in 2001, and we collect the latest data available in the database, namely those from 2015. After excluding duplicate observations, observations relating to financial and real estate industries, and firms with missing values, this study examines 9,609 firm-year observations and sample breakdown on the basis of year and industry is presented in Table 1. We perform winsorizing at the 1% and 99% levels, consistent with prior studies (Rajgopal et al., 2006), to remove the effect of outliers. Details of each variable used in the study are presented in Appendix A.

Table 1: Sample breakdown- year and industry wise

Year \ Industry	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrial	Information Technology	Material	Utilities	Total
2001	13	45	25	34	25	52	45	38	7	**284**
2002	10	41	18	34	23	48	37	105	5	**321**
2003	13	44	20	30	23	54	38	128	5	**355**
2004	29	96	31	68	62	80	70	193	10	**639**
2005	29	97	32	85	63	113	66	202	8	**695**
2006	31	102	29	93	69	120	66	226	6	**742**
2007	30	99	31	102	67	124	63	237	8	**761**
2008	33	96	31	104	70	130	67	256	10	**797**
2009	33	94	29	102	67	133	67	264	10	**799**
2010	31	88	29	104	66	133	63	220	11	**745**
2011	32	80	26	99	59	123	62	249	9	**739**
2012	30	81	26	95	58	117	57	248	11	**723**
2013	31	73	27	93	48	112	51	232	11	**678**
2014	34	71	26	87	56	104	55	225	10	**668**
2015	32	81	26	81	57	103	58	213	12	**663**
Total	**411**	**1188**	**406**	**1211**	**813**	**1546**	**865**	**3036**	**133**	**9609**

3.3.2 Models

In this study, we use the generalized least square (GLS) technique following Baltagi and Chang (1994) and Zhang and Rajagopalan (2010). To address potential first-order autoregressive (AR(1)) disturbances within unbalanced panels and correct for cross-sectional correlation and/or heteroscedasticity across panels, the GLS technique is more robust. Additionally, Greene (2018) suggests that, if the dispersion across the observations is high, more efficiency can be achieved by using the GLS rather than the ordinary least square (OLS) technique. Usually, this efficiency depends on the variable or variables used elsewhere in the model having greater dispersion.[27] Furthermore, a concern about heteroscedasticity may arise in cross-sectional panel data in which the dependent variable and the explanatory power of the model used in this study tend to vary across observations. The dependent variable of this study, namely cash holdings, is likely to be autocorrelated within the panel, because each CEO is considered to be a panel and the coefficients of these autocorrelations may differ across the panel. Additionally, the variability of the cash holdings variable is unequal across the range of values of CEO Outsider, which is the predictor variable. Therefore, GLS estimators are robust to addressing heteroscedasticity and autocorrelation and consequently more efficient than OLS estimation (Cameron & Trivedi, 2010).

By way of background, standard linear regression summarizes the relationship between a dependent variable and an independent variable with a set of other regressors focusing on the conditional mean function, that is, the central tendency of the distribution (Cameron & Trivedi, 2010). A comprehensive picture of this relationship between the dependent variable and the independent variable can be obtained through snapshots at different percentiles of the conditional distribution of the dependent variable by utilizing quantile regression (QR) (Cameron & Trivedi, 2010). One of the novelties of this study is that we employ simultaneous quantile regression (SQR) in addition to standard linear regression, that is, GLS, to capture the

[27] The dependent variable used in this study has greater dispersion (see section 4.1 for details).

impact of independent variables at different levels of cash holdings.[28] Therefore, this study will also present the impact of outsider CEOs on different distributions of firm cash holdings. Furthermore, statistical problems, such as sensitivity to outliers and non-Gaussian error distribution, can be alleviated by simultaneous quantile regression (Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Koenker & Bassett, 1978). In this study, we estimate simultaneous quantile regression at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth quantiles using the same corporate governance variables and firm characteristics as in our main GLS model. The GLS and SQR models used in this study are expressed as follows in equations 1 and 2, respectively[29]:

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ CEO\ Outsider_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (1)$$

$$Cash\ Holding_{q,i,t} = \beta_0 + \beta_{1q}\ CEO\ Outsider_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (2)$$

where q indicates a quantile at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth percentiles of the conditional distribution of firm cash holdings. For our dependent variable, we use one cash holdings measure in our main analysis and three other cash holdings measures as alternative measures of the dependent variable, and we use CEO Outsider as our independent variable (see section 3.3).

3.3.3 Variables

3.3.3.1 Cash holdings

The dependent variable of our study, cash holdings, is the ratio of cash to net assets (where net assets equal total assets minus cash) (Bates et al., 2009; Opler et al., 1999). We deflate cash by net assets, because a firm's future profitability is a function of its assets. Following Bates et al. (2009), Opler et al. (1999), and Tong (2010), we also use three different proxies to measure the level of cash holdings as additional robustness measures. Our first alternative measure is the ratio of cash and marketable securities to total assets; the second measure is the ratio of cash and marketable securities to net assets; and, finally, we use the log of the ratio of cash to net assets.

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[28] The SQR produces QR estimates for several values of q simultaneously, allowing us to capture the differences between QR coefficients at different quantiles to be tested within a single model.

[29] Variance Inflation Factor (VIF) tests has been conducted for all main and additional analyses to test for potential collinearity and no evidence of collinearity was observed.

3.3.3.2 CEO Outsider

CEO outsider is our independent variable and is equal to "1" if the CEO was not employed in the firm before becoming the CEO and "0" otherwise (Bebchuk, Grinstein, & Peyer, 2010; Milbourn, 2003). An executive who becomes CEO at the time of joining or within three months of joining is considered as an outsider CEO and takes the value "1" in every year in which he or she appears in the sample. However, if the executive has been functioning in other roles within the organization and is promoted to the role of CEO afterwards, he/she is considered as a non-outsider CEO or an insider CEO, taking a value of "0" in every year in which he/she appears in the sample.

In this paper, we also include a generalist–specialist dimension of outsider CEOs' attributes as a robustness check to investigate whether it matters if the outsider CEO has generalist skills or specialist skills. Borrowing from the generalist–specialist perspective of Brockman et al. (2016) and Custódio, Ferreira, and Matos (2013), we consider an outsider CEO as a specialist if he/she has prior industry experience or expertise (such as accounting expertise, financial expertise, engineering expertise, mining expertise, legal expertise, and HR expertise).[30] Those outsider CEOs who do not possess any such industry experience or expertise mentioned are considered as generalist outsider CEOs. Thus, Spec_Outsider is a dummy variable equal to "1" if the CEO is a specialist–outsider and "0" otherwise. Gen_Outsider is also a dummy variable equal to "1" if the CEO is a generalist–outsider and "0" otherwise. Shen and Cannella (2002) suggest that outsider CEOs tend to stay with a firm for a shorter term than insider CEOs. Therefore, outsider CEOs may act differently when they perceive their next CEO appointment. As such, we also consider outsider CEOs' tenure to investigate their impact on corporate cash holdings in the long run. Consequently, we create a dummy variable, CEO Outsider ≥ 5, which is equal to "1" if the CEO was

[30] Custódio et al. (2013) report that CEOs who have worked in different industries in their career before becoming CEO or after becoming CEO have exposure to different business environments. Therefore, this helps them to gather experience and knowledge. In addition, a CEO needs to manage capital markets, stakeholders, people inside the organization, and media. Therefore, having prior industry experience helps them to optimize their performance.

recruited from outside the firm and stayed with the firm for no less than five years and "0" otherwise (Kuang et al., 2014).

3.3.3.3 Control variables

Control variables associated with CEO Outsider and Cash Holdings are included to rule out alternative explanations for the influence of outsider CEOs on corporate cash-holding decisions. For greater representation, a number of control variables are incorporated into our analyses, as identified below.

3.3.3.3.1 Firm characteristics

We also include several firm-specific variables as controls, namely Firm Size, Return on Equity (ROE), Debt to Equity Ratio, Market to Book Ratio, Dividend, Research and Development (R&D), Capital Expenditure (CAPEX), Working Capital, Cash Flow, and Cash Flow Volatility. We measure Firm Size as the natural logarithm of the book value of the total assets (Florackis & Sainani, 2018). ROE is calculated as the net income divided by the total shareholders' equity (Zhao, 2013). Debt to Equity Ratio is calculated as the total debt divided by the total shareholders' equity (Florackis & Sainani, 2018). Market to Book Ratio is measured as (the book value of assets minus the book value of equity plus the market value of equity) divided by the book value of assets (Florackis & Sainani, 2018). Dividend is a dummy variable equal to 1 if the firm pays dividends and 0 otherwise (Jain, Li, & Shao, 2013). R&D is the research and development expenses divided by the total assets.[31] Capital Expenditure is measured as the natural logarithm of CAPEX.[32] We measure Working Capital by dividing the working capital by the total revenue. We also include Cash Flow (the cash flow divided by the total assets) and Cash Flow Volatility[33] (the standard deviation of the firm's cash flow scaled by the total assets over the prior three-year period).

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[31] Following Opler et al. (1999), we input a number of zero if the firms do not report R&D expenses.
[32] Though CAPEX data are readily available in Morning Star (DatAnalysis) and no further calculations are needed, it is measured as the ratio of capital expenditures to total assets.
[33] This follows Demerjian et al. (2013).

3.3.3.3.2 Corporate governance variables

Prior studies (Brookman & Thistle, 2009; Florackis & Sainani, 2018) suggest that CEO characteristics, such as gender and age, may influence corporate financing decisions, for example corporate cash holdings. As such, we include CEO Gender and CEO Age as vectors of our independent variable. CEO Gender is a dummy variable equal to "1" if the CEO is female and "0" otherwise. We measure CEO Age as the age of the CEO in years and use the natural log of CEO Age in all of our regression analyses. Greve and Mitsuhashi (2007) suggest that CEOs with longer tenure have the opportunity to amass social greater capital, knowledge, and expertise, which influence their decision-making choices. Therefore, we control for CEO tenure in our study, calculated as the total number of years that an individual has been in the CEO role with the firm, and we use the natural log of CEO tenure in our analyses. The most commonly used value-relevant dimensions of board operations and monitoring mechanisms of a firm are board size and board independence (Aktas et al., 2019; Florackis & Sainani, 2018). We also include board size (the total number of members of the board of directors) and board independence (the ratio of independent directors to total directors of the firm). Following Brockman et al. (2016), we also control for co-opted directors (the fraction of directors who joined the board after the CEO appointment) and board outsiders[34] (the fraction of outside directors on the board of directors). Rutherford et al. (2007) explain that frequent board meetings help board members to gather more internal information about the firm, especially financial information, which can mitigate CEOs' action by controlling their decision-making autonomy. Veprauskaitė and Adams (2013) use board meetings (the total number of board meetings held during the year) as a control variable by viewing them as an important proxy in understanding the information flow at the board level.

3.4 Empirical results

3.4.1 Descriptive statistics

Table 2 presents descriptive statistics of the dependent, independent, and control variables used in the regression analyses. Panel A of Table 2 indicates that the

[34] Vafeas (2000) explains that board outsiders are all the board members who are not employees of the firm.

firms in the sample keep an average (median) of 29% (17%) in the form of cash to their net assets. Our sample also shows Cash/Net Assets as being significantly skewed to the right, indicating a long right tail. This means that our data are not centrally distributed and provide the justification for and efficiency of using simultaneous quantile regression. The inter-quartile range of Cash/Net Assets is 0.345 (0.41–0.06),[35] meaning that our data are dispersed. As such, this distribution of Cash/Net Assets increases the efficiency of the GLS method. For publicly traded companies in Australia, 43% of the CEOs are appointed from outside, 4% more than their US counterparts (Zhang & Rajagopalan, 2010). The average (median) tenure of a CEO is 6.65 (6) years. Among the CEOs in Australia, 3% are female, and on average CEOs are 52 years old. The average board size in Australia is almost 7, of which 38% of the board members are independent. The average (median) number of co-opted directors is almost 4 (4) persons, meaning that CEOs substantially influence board members in the corporate decision-making process. Daily and Johnson (1997) argue that, as co-opted directors are nominated by the CEO, they become sympathetic and amenable to the CEO's decision making. Board members meet 7 times a year, slightly less frequently than in UK firms (Veprauskaitė & Adams, 2013). The mean log value of Australian listed firms' total assets is 18.42. The average ROE, debt to equity, and market to book ratios are -0.14, 0.38, and 2.15, respectively. Moreover, 45% of Australian firms pay dividends annually. The ratio of research and development expenditure to total assets is 31% on average. The average log of CAPEX, working capital to total sales/revenue, and cash flow to total assets are 16.25, -0.65, and -0.03, respectively. Panel B of Table 1 presents the summary statistics of specialist–generalist outsider CEOs. Of outsider CEOs, 85% are specialists, meaning that such outsider CEOs are experts or have expertise in a particular area or industry mentioned in section 3.3.2. Among the outsider CEOs, 53% stay in a firm for no less than 5 years.

[35] The range of Cash/Net Assets is 2.38 [1.97-(-0.41)]. As our dependent variable is rightly skewed, inter-quartile is a better measure than standard deviation to measure dispersion (Dawson, Trapp, & Greive, 2004).

Table 2: Descriptive statistics

Panel A: Total Sample							
Variables	**Mean**	**Median**	**St. Dev.**	**25%**	**75%**	**Skewness**	**Kurtosis**
Dependent Variable							
Cash/Net Assets	0.29	0.17	0.35	0.06	0.41	2.00	8.60
Alternative Measures of Dependent Variable							
Cash & Mkt Sec./Total Assets	0.20	0.11	0.22	0.05	0.27	1.64	5.08
Cash & Mkt Sec./Net Assets	0.64	0.13	1.90	0.05	0.37	5.45	34.90
Log (Cash/Net Assets)	-2.17	-2.20	1.84	-3.28	-1.05	0.06	3.57
Independent Variable							
CEO Outsider	0.43	0.00	0.50	0.00	1.00	0.30	1.09
Corporate Governance Variables							
CEO Gender	0.03	0.00	0.17	0.00	0.00	5.68	33.30
CEO Age	52.09	52.00	6.47	49.00	55.00	0.15	4.28
CEO Tenure	6.65	6.00	3.99	3.00	9.00	0.64	2.45
Board Size	6.53	6.00	2.65	5.00	8.00	1.82	10.26
Co-Opted Director	3.78	4.00	2.58	2.00	5.00	0.70	4.20
% Board Independence	0.38	0.40	0.25	0.18	0.57	-0.05	3.06
Board Meetings	7.38	6.00	6.30	3.00	10.00	1.63	8.12
% Board Outsider	0.70	0.75	0.16	0.60	0.83	-1.13	4.15
Firm Characteristics							
Firm Size (Log)	18.42	18.28	2.20	16.86	19.90	0.17	2.68
ROE	-0.14	0.05	0.97	-0.17	0.15	-4.08	29.72
Debt to Equity	0.38	0.17	0.78	0.00	0.54	2.52	15.39
Market to Book	2.15	1.38	2.62	0.95	2.27	4.75	31.70
Dividend Pay	0.45	0.00	0.50	0.00	1.00	0.21	1.04
R&D/Total Assets	0.31	0.01	0.60	0.00	0.16	1.70	4.06
CAPEX (log)	16.25	16.42	2.77	14.53	18.20	-0.35	2.92
WC/Total Revenue	-0.65	0.02	2.79	-0.21	0.16	-3.96	18.43
Cash Flow/Total Assets	-0.03	0.04	0.27	-0.07	0.11	-2.64	12.26
Cash Flow Volatility	0.09	0.05	0.12	0.02	0.10	3.27	16.34
Panel B: CEO Outsider							
Spec_Outsider	0.85	1.00	0.36	1.00	1.00	-1.92	4.69
Gen_Outsider	0.15	0.00	0.36	0.00	0.00	1.92	4.69
CEO Outsider ≤ 5	0.53	1.00	0.50	0.00	1.00	-0.13	1.02

This table provides the descriptive statistics of all the variables used in this study. After excluding duplicate observations, observations related to the financial industry and real estate industry, and firms with missing values, 9609 firm-years have complete information at the CEO, board, and firm levels from 2001 to 2015. Panel A of this table presents the descriptive statistics of the total sample of this study. Details of each variable used are presented in Appendix A. Panel B of this table presents the descriptive statistics of specialist outsider CEOs and generalist outsider CEOs. The sample consists of 5079 firm-year observations for outsider CEOs.

3.4.2 Correlation matrix

Table 3 presents the correlation matrix of the variables used in our study. Cash/Net Assets is positively correlated with CEO Outsider, but the relationship is not significant. A positive significant relationship exists between Cash/Net Assets and variables such as CEO Gender, Debt to Equity, Market to Book, R&D to Total Assets, and Cash Flow Volatility. However, negative significant relationships exist between Cash/Net Assets and CEO Age, Board Size, Co-opted Director, Board Independence, Board Meetings, Board Outsider, Firm Size, ROE, Dividend Pay, CAPEX, WC/Total Revenue, and Cash Flow/Total Assets. The relationship between Cash/Net Assets and CEO Tenure and R&D/Total Assets is not significant. The correlation between Firm Size and CAPEX is 0.84, exceeding the multicollinearity threshold of 0.8 (Hair, Anderson, Babin, & Black, 2010). Therefore, we run the GLS regression from equation (1) dropping Firm Size and keeping CAPEX, and subsequently we rerun the GLS regression from equation (1) dropping CAPEX and keeping Firm Size, to determine whether multicollinearity affects the sign and magnitude of our study. The regression results confirm that multicollinearity does not affect the sign and magnitude. Therefore, we leave equation (1) as it is for the rest of the analysis.

Table 3: Pearson correlation analysis

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1)	Cash/Net Assets	1																			
(2)	CEO Outsider	0.01	1																		
(3)	CEO Gender	0.03**	-0.01	1																	
(4)	CEO Age (log)	-0.04***	-0.06***	-0.05***	1																
(5)	CEO Tenure (log)	-0.01	-0.17***	-0.01	0.08***	1															
(6)	Board Size (log)	-0.11***	0.07***	0.03**	0.03*	-0.15***	1														
(7)	Co-opted Director (log)	-0.07***	-0.32***	-0.00	0.10***	0.26***	0.33***	1													
(8)	Board Independence	-0.04***	0.04***	0.02	0.11***	0.15***	0.12***	0.10***	1												
(9)	Board Meetings (log)	-0.13***	-0.01	0.01	0.07***	0.01	0.52***	0.23***	0.36***	1											
(10)	Board Outsider	-0.08***	0.10***	0.01	0.03***	-0.05***	0.37***	0.04***	0.34***	0.38***	1										
(11)	Firm Size (log)	-0.26***	-0.05***	-0.00	0.13***	0.06***	0.57***	0.27***	0.37***	0.61***	0.37***	1									
(12)	ROE	-0.40***	-0.04***	-0.01	0.01	0.09***	0.09***	0.05***	0.09***	0.15***	0.07***	0.27***	1								
(13)	Debt to Equity	0.13***	-0.04***	-0.00	0.01	-0.02	0.13***	0.05***	0.04***	0.13***	0.07***	0.24***	-0.29***	1							
(14)	Market to Book	0.21***	0.03**	0.00	-0.04***	0.02*	-0.10***	-0.03**	-0.05***	-0.12***	-0.06***	-0.30***	-0.11***	-0.15***	1						
(15)	Dividend Pay	-0.19***	-0.12***	0.02*	0.08***	0.13***	0.31***	0.16***	0.24***	0.41***	0.20***	0.57***	0.26***	0.14***	-0.15***	1					
(16)	R&D/Total Assets	0.02	0.01	-0.02*	-0.04***	0.01	-0.08***	-0.04***	-0.04***	-0.05***	-0.07***	-0.08***	-0.03**	-0.01	0.00	-0.03*	1				
(17)	CAPEX (log)	-0.25***	-0.04***	-0.03**	0.10***	0.06***	0.47***	0.23***	0.31***	0.51***	0.30***	0.84***	0.23***	0.19***	-0.22***	0.45***	-0.07***	1			
(18)	WC/Total Revenue	-0.11***	-0.03**	0.01	0.03**	0.02*	0.09***	0.04***	0.08***	0.16***	0.07***	0.19***	0.10***	0.08***	-0.14***	0.22***	0.01	0.13***	1		
(19)	Cash Flow/Total Assets	-0.22***	-0.10***	-0.01	0.03**	0.15***	0.15***	0.12***	0.16***	0.26***	0.11***	0.52***	0.40***	0.13***	-0.40***	0.43***	-0.04***	0.49***	0.20***	1	
(20)	Cash Flow Volatility	0.24***	0.07***	-0.01	-0.07***	-0.11***	-0.13***	-0.10***	-0.15***	-0.21***	-0.11***	-0.42***	-0.21***	-0.12***	0.33***	-0.29***	0.03**	-0.37***	-0.11***	-0.51***	1
	N	9609																			

This table summarizes the results of the Pearson correlation matrices among the variables used in this study. Refer to Appendix 1 for the definition of these variables. The correlations are * statistically significant at the 10% level; ** statistically significant at the 5% level; and *** statistically significant at the 1% level.

3.4.3 Multivariate analyses

3.4.3.1 Cash holdings and outsider CEOs

Model 1 of Table 4 presents the GLS regression results between the cash holdings measure and the variable CEO Outsider from equation (1).[36] However, the standard linear regression estimator focuses only on the central tendency of the distribution of a sample and does not consider the impact of the independent variable on the corporate cash-holding policy from low-cash-holding firms to high-cash-holding firms. Therefore, we also apply the simultaneous quantile regression estimators reported from equation (2) to capture the impact of independent variables at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth quantiles of cash holdings. Model 2 to Model 6 of Table 4 present the result of the simultaneous quantile regression of this study. Following Brockman et al. (2016), Florackis and Sainani (2018), Opler et al. (1999), and Veprauskaitė and Adams (2013), we include the same corporate governance and firm-level control variables in both GLS and simultaneous quantile models. The definitions of all the variables are given in Appendix A.

The results presented in Model 1 of Table 4 indicate a negative relationship between CEO Outsider and cash holdings (Cash/Net Assets), which is statistically significant at the 1% level. This result suggests that firms with outsider CEOs hold a lower level of cash.[37] The economic magnitude of this relationship is also significant. For example, a 1 standard deviation increase in CEO Outsider (0.50) results in a -1.02% decrease in firms' level of cash holdings relative to the sample mean (0.29). This result also indicates that the appointment of outsider CEOs reduces firms' cash reserve.[38] In Model 1 of Table 4, the coefficients for Firm Size, ROE, Debt to Equity, Dividend Pay, CAPEX, Working Capital to Total Revenue, and Cash Flow to Total

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[36] Following Bates et al. (2009) and Opler et al. (1999), we also run ordinary least square (OLS) regression with the dependent variable used in this study as well as alternative measures of cash holdings and find that the coefficient of CEO Outsider is negative across all the cash holdings measures (the results are shown in Appendix B) and statistically significant.

[37] To investigate whether insider CEOs act differently from outsider CEOs, we also replace our independent variable with CEO Insider and run the regressions. The results are explained in section 5.2.

[38] Our result shows that outsider CEOs reduce firms' level of cash reserves. This result raises another question: Where is the cash going? Therefore, we incorporate tunnelling evidence of the reduction of cash reserves by the appointment of outsider CEOs. The details are discussed in section 4.3.2.

Assets are negative and statistically significant, consistent with the prior literature for US and UK firms (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018). Also consistent with the prior literature, our measure of cash holdings is positively and significantly associated with the market to book ratio and cash flow volatility, implying that firms with high market to book ratios and higher cash flow volatility hold more cash and vice versa. Florackis and Sainani (2018) also suggest that, to take advantage of investment opportunities, firms with higher cash flow volatility hold more cash. Following Custódio and Metzger (2014), Florackis and Sainani (2018), Harford et al. (2008), and Veprauskaitė and Adams (2013), we include CEO-level and board-level control variables and find these to be mostly consistent with the prior studies. Firms with younger CEOs and boards with a lower number of outsider directors and co-opted directors keep higher amounts of cash. On the other hand, the coefficients for Board Size, Board Meetings, and Board Independence are positive and statistically significant at the 1%, 1%, and 5% levels. However, opposite to UK and US firms (Bates et al., 2009; Custódio & Metzger, 2014; Florackis & Sainani, 2018; Opler et al., 1999), our study finds a positive and significant association between Cash Holdings and R&D to Total Assets. Overall, the coefficients of Firm Size, Market to Book Ratio, Dividend Pay, Working Capital to Total Revenue, and Cash Flow to Total Assets are consistent with trade-off theory (Opler et al., 1999). Though trade-off theory makes an ambiguous prediction about the coefficient of leverage (debt to equity), the result of the coefficient is consistent with Ferreira and Vilela (2004) and Opler et al. (1999).

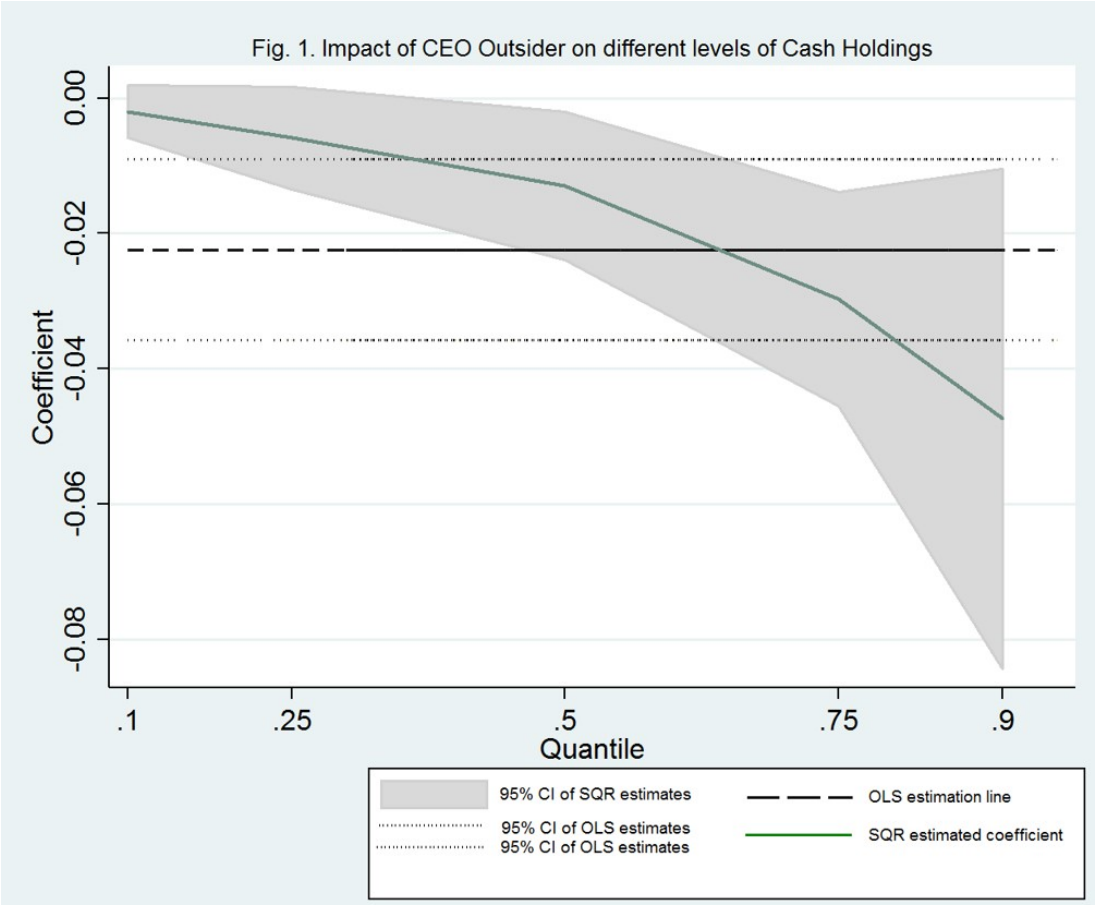
Table 4: Multivariate analysis

Dependent variable: Cash/NetAssets						
Variables	**Main Model**	**Simultaneous Quantile Regression**				
		10th Quant.	**25th Quant.**	**50th Quant.**	**75th Quant.**	**90th Quant.**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
CEO Outsider	-0.0059***	-0.0020	-0.0059*	-0.0129**	-0.0297***	-0.0474***
	(-3.2967)	(-1.0790)	(-1.8135)	(-2.1755)	(-3.7041)	(-2.6857)
CEO Gender	-0.0026	0.0142*	0.0135*	0.0025	0.0328	0.0038
	(-0.5005)	(1.8579)	(1.7330)	(0.2315)	(1.3190)	(0.1187)
CEO Age (log)	-0.0099	-0.0142**	-0.0281**	-0.0080	-0.0719*	-0.0289
	(-1.4619)	(-2.0400)	(-2.4216)	(-0.4188)	(-1.7867)	(-0.4418)
CEO Tenure (log)	0.0018	0.0014	0.0039**	0.0122***	0.0099	-0.0116
	(1.4483)	(1.1145)	(2.2220)	(2.7377)	(1.1669)	(-0.9138)
Board Size (log)	0.0240***	0.0034	0.0196***	0.0362***	0.0508***	0.0187
	(7.6845)	(0.7184)	(2.9648)	(3.6265)	(3.1666)	(0.6401)
Co-Opted Director (log)	-0.0076***	-0.0011	-0.0025	-0.0148***	-0.0242***	-0.0179*
	(-6.0675)	(-0.6814)	(-0.8865)	(-2.9022)	(-3.5023)	(-1.7065)
% Board Independence	0.0105**	0.0215***	0.0343***	0.0387***	-0.0047	0.0003
	(2.4933)	(4.5672)	(6.2147)	(3.1182)	(-0.2188)	(0.0069)
Board Meetings (log)	0.0087***	0.0021	0.0059**	0.0121***	0.0205**	-0.0061
	(6.6356)	(1.4755)	(2.3040)	(3.3683)	(2.3922)	(-0.4318)
% Board Outsider	-0.0208***	-0.0276***	-0.0473***	-0.0507**	-0.0458*	0.0388
	(-3.1839)	(-3.2758)	(-3.8533)	(-2.2681)	(-1.7220)	(0.5942)
Firm Size (Log)	-0.0091***	-0.0011	-0.0051***	-0.0070**	-0.0065	-0.0092
	(-8.4932)	(-0.6365)	(-2.6107)	(-2.3483)	(-0.9861)	(-0.8903)
ROE	-0.0099***	-0.0590***	-0.0900***	-0.1379***	-0.1691***	-0.1531***
	(-5.2836)	(-6.3980)	(-10.2414)	(-7.7610)	(-10.6170)	(-8.4677)
Debt to Equity	-0.0261***	0.0134***	0.0133***	0.0237***	0.0486***	0.0976***
	(-19.2519)	(3.1853)	(3.5790)	(2.9966)	(4.0373)	(3.9476)
Market to Book	0.0189***	0.0018*	0.0112***	0.0301***	0.0324***	0.0240***
	(27.9475)	(1.7563)	(7.5525)	(10.0953)	(9.6886)	(8.2907)
Dividend Pay	-0.0177***	-0.0005	-0.0095**	-0.0141*	-0.0343**	-0.0531***
	(-6.9928)	(-0.1676)	(-2.1422)	(-1.9002)	(-2.0128)	(-3.3285)
R&D/Total Assets	-0.0211***	-0.0032	-0.0084	-0.0229*	0.0115	0.0135
	(-3.2235)	(-0.3819)	(-1.1794)	(-1.6539)	(0.3041)	(0.2216)
CAPEX (log)	-0.0089***	-0.0008	-0.0030***	-0.0119***	-0.0280***	-0.0378***
	(-11.2594)	(-0.8509)	(-2.6520)	(-5.7005)	(-6.4356)	(-6.2431)
WC/Total Revenue	-0.0050***	-0.0002	-0.0026***	-0.0077***	-0.0103***	-0.0144***
	(-9.5174)	(-0.2151)	(-3.3492)	(-3.8645)	(-4.0739)	(-3.8437)
Cash Flow/Total assets	-0.0031	0.1343***	0.1769***	0.2314***	0.2747***	0.2920***
	(-0.4325)	(6.7399)	(9.5314)	(8.2407)	(6.3786)	(7.6652)
Cash Flow Volatility	0.2226***	0.0353	0.1174***	0.4292***	0.6901***	0.7384***
	(14.9418)	(0.9997)	(3.0412)	(7.0749)	(9.4430)	(8.5417)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.3838***	0.1020***	0.2502***	0.3293***	0.9008***	1.2666***
	(13.4403)	(3.1418)	(4.9942)	(4.7800)	(6.1279)	(4.8391)
Observations	9,610	9,609	9,609	9,609	9,609	9,609
Wald v2 statistics (41)	16457.95					
R-squared		0.0533	0.0665	0.1302	0.2108	0.2439

Model 1 of Table 3 presents the results of the generalized least square (GLS) regression of Cash Holdings and CEO Outsider reported in Eq. (1). We run GLS regressions by including year and industry effects. This study includes all firms listed on the ASX for the observation period 2001 to 2015 except financial institutions, banks, and insurance companies (see section 3.1). The sample consists of 9609 firm-year observations. Models 2–6 of Table 3 present the results of the SQR estimators at the 10th, 25th, 50th, 75th and 90th quantiles of firm cash holdings. SQR, in addition to the standard linear regressions such as GLS, captures the impact of CEO outsiders at different levels of cash holdings. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Models 2–6 of Table 4 present the results of the SQR estimators of this study. CEO Outsider is consistently negatively associated at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth quantiles of firms' cash-holding distribution, and the economic magnitude of all the quantiles is significant at either the 5% or the 1% level except Model 1. More specifically, a 1 standard deviation increase in CEO Outsider results in a -0.34%, -1.01%, -2.23%, -5.12%, and -8.17% decrease in firms' levels of cash holdings at the tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth quantiles, respectively. The magnitude of the effect of CEO Outsider therefore increases monotonically from lower quantiles to higher quantiles, meaning that the impact of outsider CEOs is significantly greater in firms with high cash holdings than in firms with low cash holdings. This evidence is consistent with our conjecture in light of trade-off theory, which suggests that firms hold cash for two reasons, specifically to reduce transaction costs and as a precaution (Kuan et al., 2012; Opler et al., 1999). The appointment of an outsider CEO who brings his/her established external network, reputation, and industry expertise effectively gives the firm easier access to the external financial marketplace and subsequently reduces the transaction cost for sourcing cash when required. Therefore, this explains why such outsider CEOs choose to hold less cash internally.

We present graphically the estimated coefficients of CEO Outsider against the different quantiles (solid lines) and their confidence interval (shaded region) at the 95% level together with the OLS (dotted lines) confidence intervals of the OLS regression and the OLS estimation line (dashed and solid line) in Figure 1. The coefficients from the simultaneous quantile regression of CEO Outsider vary with quantiles and evidence a consistently increasing pattern, indicating that the quantile causal effects become stronger from lower quantiles to upper quantiles. Overall, Figure 1 suggests that the appointment of an outsider CEO reduces firm cash holdings but that the intensity of this reduction gradually increases from lower quantiles to upper quantiles.



3.4.3.2 Tunnelling of cash: Investments then dividends

All the models presented in Table 4 indicate a negative relationship between CEO Outsider and cash holdings (Cash/NetAssets), and the economic magnitude of this relationship is statistically significant in all the models except model 2. This result raises another question: where is the cash going? There are two established explanations for cash holdings: operational considerations and the agency issue. Bates et al. (2009), Denis and Sibilkov (2010), Duchin (2010), and Opler et al. (1999) support the operational considerations explanation that adjustments to levels of cash holdings depend on investment opportunities and constraints. In contrast, the proponents of agency theory suggest that adjustments to levels of cash holdings largely depend on agency conflicts between the management and the board of directors and the shareholders, because the management may hold cash to achieve personal benefits (Dittmar & Mahrt-Smith, 2007; Gao, Harford, & Li, 2013; Harford, 1999; Harford et al., 2008). However, outside CEOs bring novel knowledge, expertise, and skills as well as an intention to implement an innovative strategy to influence the firm performance positively and quickly (Zhang & Rajagopalan, 2003, 2010). Furthermore, CEOs'

outsider status, which includes an established network, and their experience allow them to enjoy a competitive advantage in the search for new investment opportunities as well as in the external debt market. Therefore, this study assesses the negative and significant association in Model 1 of Table 4 between cash holdings and capital expenditure (CAPEX), meaning that firms' level of cash holdings decreases when CAPEX increases and vice versa. Subsequently, to investigate the association between outsider CEOs and CAPEX in the following year, we run another GLS regression, replacing our dependent variable, Cash Holdings, with CAPEX, as reported in Eq. (3).

$$CAPEX_{i,t+1} = \beta_0 + \beta_1\ CEO\ Outsider_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (3)$$

Model 1 of Table 5 presents the relationship between CEO Outsider and CAPEX in year (*t+1*). The result of this model indicates a positive and statistically significant association at the 1% level between CEO Outsider and CAPEX in year (*t+1*), meaning that outsider CEOs reduce firm cash holdings during the year of their appointment and increase capital expenditure in the subsequent year to benefit from investment opportunities so that they can create a positive value for the firm for the existing management as well as the shareholders. This result also supports the trade-off theory of cash holdings.

In addition to considering the short-term objective of outsider CEOs, we examine outsider CEOs' tenure to investigate this impact on corporate cash holdings in the long run. Consequently, we create a dummy variable, *CEO Outsider* ≥ 5, which is equal to "1" if the CEO was recruited from outside the firm and stayed with the firm for no less than five years[39] and "0" otherwise. Therefore, we redesign equation 1 as follows:

$$Cash\ Holding_{i,t} = \beta_0 + \beta_1\ CEO\ Outsider \geq 5_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (4)$$

[39] Borrowing from Kuang et al. (2014), we take the cut-off point for long-tenured CEOs as five years or more to construct a dummy variable, because the average CEO tenure of our sample is slightly more than 6.5 years. To capture the impact of long-tenured CEOs' behaviour on cash holdings, it is pragmatic to take a year lower than the average CEO tenure, and subsequently this allows us to investigate whether CEOs transfer resources from the company for their own empire building.

Table 5: Tunnelling of cash: Investment and dividends

Variables	CAPEX (log)(*t*+1)	Cash/Net Assets	Dividend Pay(*t*+1)
	Model 1	**Model 2**	**Model 3**
CEO Outsider	0.0393***		
	(2.8117)		
CEO Outsider ≥ 5		0.0115*	0.0331***
		(1.7434)	(4.2831)
CEO Gender	-0.1251***	0.0790***	0.0260
	(-3.3629)	(4.6786)	(1.4547)
CEO Age (log)	-0.0860*	0.0086	0.1909***
	(-1.8487)	(0.5179)	(8.2034)
CEO Tenure (log)	0.0273***	-0.0012	0.0307***
	(2.7111)	(-0.2558)	(4.8452)
Board Size (log)	-0.0186	0.0100	0.0037
	(-0.8329)	(1.2672)	(0.3732)
Co-Opted Director (log)	0.0290***	-0.0202***	-0.0228***
	(2.9464)	(-7.0222)	(-5.4383)
% Board Independence	0.0430	0.0423***	0.0900***
	(1.2667)	(3.8129)	(6.2736)
Board Meetings (log)	-0.0519***	0.0110***	0.0098**
	(-4.5313)	(2.7857)	(2.0992)
% Board Outsider	-0.0291	-0.0292*	0.0616***
	(-0.6151)	(-1.7544)	(3.2615)
Firm Size (Log)	-0.0095*	-0.0039	0.1056***
	(-1.7955)	(-1.5807)	(40.4322)
ROE	0.0726***	-0.1206***	0.0041
	(5.1882)	(-27.3649)	(1.2814)
Debt to Equity	-0.0321***	0.0608***	-0.0133***
	(-3.1965)	(17.1662)	(-2.8956)
Market to Book	0.0470***	0.0202***	0.0144***
	(12.3266)	(15.3589)	(11.8453)
Dividend Pay	0.0325*	-0.0177***	
	(1.8332)	(-3.1837)	
R&D/Total Assets	-0.0552	-0.0239*	-0.0180
	(-0.9377)	(-1.8245)	(-1.0406)
CAPEX (log)		-0.0157***	-0.0022
		(-8.6339)	(-1.3215)
WC/Total Revenue	-0.0092***	-0.0067***	0.0076***
	(-2.6367)	(-7.7578)	(8.8317)
Cash Flow/Total Assets	0.2199***	0.1552***	0.1206***
	(4.4931)	(10.0076)	(7.6464)
Cash Flow Volatility	0.2298**	0.2931***	-0.0444*
	(2.4623)	(10.6352)	(-1.7571)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Constant	0.4080**	0.3663***	-2.1134***
	(2.1399)	(5.2681)	(-21.5889)
Observations	8,252	4,088	4,089
Wald chi^2	1138.88	4754.91	40305.65

This table reports the regression results of CEO outsider and cash holdings from the tunnelling point of view. We run GLS regressions by including year and industry effects. Model 1 of Table 5 presents the relationship between CEO Outsider and CAPEX in year (*t*+1). Model 2 of Table 5 reports the result between CEO Outsider ≥ 5 (a dummy variable equal to "1" if the CEO was recruited from outside the firm and stayed with the firm for no less than five years and "0" otherwise) and cash holdings (Cash/NetAssets). Model 3 of Table 5 presents the regression result between CEO Outsider ≥ 5 and Dividend Pay in year (*t*+1). Here *t* indicates year 5 because equation 5 capture the relationship where CEO Outsider ≥ 5 is defined a dummy variable equal to "1" if the outsider CEO stays within the firm for no less than five years and "0" otherwise. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

The results presented in Model 2 of Table 5 indicate a positive and statistically significant relationship between CEO Outsider ≥ 5 and cash holdings (Cash/NetAssets), meaning that outsider CEOs act differently when they perceive that their next appointment is closer.[40] Therefore, this result supports the argument of the proponents of agency conflict mentioned earlier in this section.

Agency theory suggests that the top management sometimes holds cash to achieve personal benefits. We consider the tunnelling perspective introduced by Johnson et al. (2000), who explain that the term tunnelling refers to the transfer of resources from a company to its controlling shareholders, specifically the top management. As the CEO is the leader of the top management team, this study also contemplates CEOs' action in the long run with the possibility that they may stockpile cash to gain or secure a personal benefit within the agency theory framework. Therefore, following Chen et al. (2009), we use dividends as the tool for tunnelling used by outsider CEOs when they perceive their next appointment to be imminent. As such, we redesign equation 4 as follows:

$$Dividend\ Pay_{i,t+1} = \beta_0 + \beta_1\ CEO\ Outsider \geq 5_{i,t} + [Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (5)$$

Model 3 of Table 5 presents the regression result from equation 5. The result reports a positive and statistically significant relationship at the 1% level between CEO Outsider ≥ 5 and Dividend Pay in year ($t+1$)[41], meaning that, when the outsider CEO stays at the firm for more than or equal to five years, he/she may perceive that his/her next appointment is imminent and use dividend pay-outs as a means of tunnelling to secure his/her personal benefit. As such, an outsider CEO increases the dividend pay-outs in the following years when he/she stays at the firm for five years or more. The result also supports the second established explanation of adjusting firms' level of cash within the agency theory framework discussed earlier in this section.

[40] Shen and Cannella (2002) suggest that outsider CEOs change their motivation when they perceive that their next appointment is imminent.

[41] Here t indicates year 5 because equation 5 capture the relationship where CEO Outsider ≥ 5 is defined a dummy variable equal to "1" if the outsider CEO stays within the firm for no less than five years and "0" otherwise.

3.5 Robustness checks

To provide further evidence supporting our main analysis, we employ a series of auxiliary tests to confirm the robustness of our results.

3.5.1 Alternative measures of cash holdings

The results from our main models show a negative and statistically significant relationship between outsider CEOs and corporate cash holdings. To support the results from our main models, in this section, we use three alternative measures of cash holdings to confirm that the results from our main analysis are not driven by our selection of the variable cash holdings. Following Bates et al. (2009), Opler et al. (1999), and Tong (2010), we use three different proxies to measure the levels of cash holdings, namely the ratio of cash and marketable securities to total assets, cash and marketable securities by net assets, and log of the ratio of cash to net assets.[42] Table 6 presents the regression results from the alternative measures of cash holdings and CEO Outsider. All the alternative measures of cash holdings reported in Models 1, 2, and 3 report a negative and statistically significant relationship with outsider CEOs at the 1%, 1%, and 5% levels, respectively. We use the same CEO-level, board-level, and firm-level variables in all three new models of cash holdings. The sign and magnitude of most of the control variables are also consistent with our main analysis. Consequently, considering the evidence in Table 6, we conclude that the alternative measures of cash holdings validate our main analysis, further reinforcing our main findings.

[42] The details of each variable used in the study are presented in Appendix A.

Table 6: Alternative measures of cash holdings

Variables	Cash & Mkt Sec./ Total Assets	Cash & Mkt Sec. /Net Assets	Log (Cash/ Net Assets)
	Model 1	**Model 2**	**Model 3**
CEO Outsider	-0.0059***	-0.0417***	-0.0502**
	(-3.2967)	(-5.8720)	(-2.3632)
CEO Gender	-0.0026	0.0762***	0.0349
	(-0.5005)	(5.0697)	(0.7098)
CEO Age (log)	-0.0099	-0.0165	-0.0905
	(-1.4619)	(-0.6460)	(-1.1571)
CEO Tenure (log)	0.0018	0.0105**	0.0619***
	(1.4483)	(2.2012)	(4.1047)
Board Size (log)	0.0240***	0.0549***	0.2831***
	(7.6845)	(4.2436)	(7.7225)
Co-Opted Director (log)	-0.0076***	-0.0238***	-0.0635***
	(-6.0675)	(-4.5829)	(-4.0573)
% Board Independence	0.0105**	0.0676***	0.2024***
	(2.4933)	(4.0324)	(4.0848)
Board Meetings (log)	0.0087***	0.0259***	0.1090***
	(6.6356)	(4.2779)	(6.4748)
% Board Outsider	-0.0208***	-0.0461*	-0.1607**
	(-3.1839)	(-1.8447)	(-2.2709)
Firm Size (Log)	-0.0091***	0.0083*	-0.1714***
	(-8.4932)	(1.9301)	(-15.3888)
ROE	-0.0099***	-0.0180**	-0.0844***
	(-5.2836)	(-2.1042)	(-5.4132)
Debt to Equity	-0.0261***	-0.0528***	-0.3494***
	(-19.2519)	(-9.8559)	(-21.1542)
Market to Book	0.0189***	0.0726***	0.1239***
	(27.9475)	(26.6289)	(25.9980)
Dividend Pay	-0.0177***	-0.0492***	-0.1782***
	(-6.9928)	(-5.8874)	(-6.6394)
R&D/Total Assets	-0.0211***	-0.0905***	-0.1257**
	(-3.2235)	(-4.5883)	(-1.9704)
CAPEX (log)	-0.0089***	-0.0482***	-0.0374***
	(-11.2594)	(-14.2398)	(-4.8760)
WC/Total Revenue	-0.0050***	-0.0179***	-0.0316***
	(-9.5174)	(-6.6849)	(-9.6077)
Cash Flow/Total Assets	-0.0031	-0.2191***	0.4518***
	(-0.4325)	(-6.5761)	(7.7610)
Cash Flow Volatility	0.2226***	0.5420***	1.7487***
	(14.9418)	(8.1772)	(15.4019)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Constant	0.3838***	0.6448***	0.5970*
	(13.4403)	(5.9434)	(1.8257)
Observations	9,610	9,610	9,556
Wald chi^2 (41)	11770.70	15103.8	10547.59

This table reports the regression result of three alternative measures of cash holdings and CEO outsider. Reported t-values are based on standard errors adjusted for heteroscedasticity across panels and correction for cross-sectional correlation by implementing GLS regression model. All regressions include year and industry effects. Model 1, Model 2 and Model 3 represents the alternative measures of dependant variables of this study. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

3.5.2 CEO insider

If the CEO is not appointed externally, the role of the CEO must be filled within the firm by promoting an internal executive. Unlike outside CEOs, insider CEOs are more familiar with the organizational culture and have firm-specific knowledge and skills as well as being less likely to have outside board networks than their outsider counterparts (Jongjaroenkamol & Laux, 2017; Zhang & Rajagopalan, 2010). Therefore, it is likely that insider CEOs' access to the capital market will not be as developed as that of outside CEOs, suggesting that insider CEOs may act differently from outside CEOs towards levels of cash holdings. As such, we also investigate the relationship between insider CEOs and corporate cash holdings as a robustness check to confirm that the appointment of outsider CEOs matters to firms' cash-holding policy. Subsequently, we create a dummy variable equal to "1" if the CEO position has been filled by promoting from within the firm's existing executives and "0" otherwise. We keep all the control variables used in our main regression analysis. Table 7 presents the regression results between four cash holdings measures (used in Tables 3 and 5) and CEO Insider. All the models (Models 1 to 4) of Table 7 show a positive and statistically significant association between CEO Insider and all our cash holding measures. This result indicates that, unlike outsider CEOs, insider CEOs amass cash rather than reducing cash reserves, perhaps as a result of higher transaction costs as well as costly external finance in times of necessity and crisis.

Table 7: Insider CEO perspective

Variables	Cash/ Net Assets	Cash & Mkt Sec./ Total Assets	Cash & Mkt Sec./ Net Assets	Log (Cash/ Net Assets)
	Model 1	**Model 2**	**Model 3**	**Model 4**
CEO Insider	0.0102***	0.0062***	0.0305***	0.0478**
	(3.4705)	(3.4564)	(4.2942)	(2.2478)
CEO Gender	0.0280***	-0.0025	-0.0003	0.0258
	(3.0588)	(-0.4839)	(-0.0176)	(0.5210)
CEO Age (log)	-0.0380***	-0.0034	0.0008	-0.0447
	(-3.3145)	(-0.4951)	(0.0324)	(-0.5688)
CEO Tenure (log)	0.0070***	0.0009	0.0116**	0.0616***
	(3.2671)	(0.7474)	(2.4977)	(4.0767)
Board Size (log)	0.0345***	0.0245***	0.0453***	0.2883***
	(6.8066)	(7.7983)	(3.5385)	(7.8586)
Co-Opted Director (log)	-0.0129***	-0.0077***	-0.0205***	-0.0652***
	(-5.9925)	(-6.0660)	(-4.0556)	(-4.1665)
% Board Independence	0.0228***	0.0108**	0.0329**	0.2024***
	(3.0204)	(2.5707)	(2.0136)	(4.1088)
Board Meetings (log)	0.0099***	0.0086***	0.0235***	0.1138***
	(4.4738)	(6.9140)	(3.9236)	(6.7367)
% Board Outsider	-0.0313***	-0.0180***	-0.0398*	-0.1237*
	(-2.7381)	(-2.7601)	(-1.6541)	(-1.7527)
Firm Size (Log)	-0.0079***	-0.0093***	0.0037	-0.1711***
	(-4.5852)	(-8.6846)	(0.8648)	(-15.3438)
ROE	-0.1126***	-0.0103***	-0.0157*	-0.0896***
	(-30.9143)	(-5.5507)	(-1.8612)	(-5.7340)
Debt to Equity	0.0406***	-0.0268***	-0.0509***	-0.3549***
	(15.7094)	(-19.9681)	(-9.7656)	(-21.6643)
Market to Book	0.0227***	0.0190***	0.0642***	0.1244***
	(23.1958)	(28.2101)	(21.8481)	(25.6079)
Dividend Pay	-0.0110***	-0.0178***	-0.0303***	-0.1742***
	(-2.8845)	(-7.1541)	(-3.6272)	(-6.4992)
R&D/Total Assets	-0.0308***	-0.0219***	-0.0881***	-0.1277**
	(-2.6769)	(-3.3570)	(-4.4273)	(-1.9815)
CAPEX (log)	-0.0156***	-0.0090***	-0.0405***	-0.0399***
	(-12.7087)	(-11.3923)	(-11.7937)	(-5.2127)
WC/Total Revenue	-0.0074***	-0.0050***	-0.0194***	-0.0301***
	(-11.0096)	(-9.4919)	(-7.2016)	(-9.7768)
Cash Flow/Total Assets	0.1976***	-0.0021	-0.2436***	0.4389***
	(15.9930)	(-0.2921)	(-7.4251)	(7.3608)
Cash Flow Volatility	0.3551***	0.2216***	0.6150***	1.7550***
	(15.6305)	(14.9970)	(9.3329)	(15.4656)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Constant	0.5609***	0.3599***	0.5160***	0.4139
	(11.8851)	(12.6059)	(4.7965)	(1.2701)
Observations	9,704	9,705	9,705	9,651
Wald v2 statistics (41)	8575.58	15325.6	2399.05	11254.43

This table reports the regression result of CEO insider and all measures of cash holdings used in this study. Reported t-values are based on standard errors adjusted for heteroscedasticity across panels and correction for cross-sectional correlation by implementing GLS regression model. All regressions include year and industry effects. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

3.5.3 Generalist–specialist perspectives on CEO outsider–insider attributes

The prior literature on CEO origin (Farrell & Whidbee, 2003; Jongjaroenkamol & Laux, 2017; Kuang et al., 2014; Parrino, 1997; Zhang & Rajagopalan, 2003, 2010) and CEO experience, ability, and expertise (Baik et al., 2011; Barker III & Mueller, 2002; Custódio & Metzger, 2014; Kaplan et al., 2012) indicates that CEOs' previous experience in different organizations, similar industries, advanced education, and professional certification influence their managerial ability and increase their likelihood of being appointed and promoted as CEO. Therefore, we investigate further both dimensions of CEO origin, that is, outsider CEOs and insider CEOs, from a generalist–specialist perspective.[43]

Table 8 (Models 1 to 4) presents the relation between generalist–specialist attributes of outsider CEOs and insider CEOs and corporate cash holdings. Model 1 of Table 8 provides the regression results between the cash holdings measure and Spec_Outsider. The result indicates a negative and statistically significant relationship at the 5% level between Spec_Outsider and the cash holdings measure, suggesting that outsider CEOs may have special skills or experience that cause them to keep low cash reserves. Model 2 of Table 5 presents the result of our test of the relationship between the cash holdings measure and Gen_Outsider. We find a negative coefficient and a statistically significant relationship, meaning that, like specialist outsider CEOs, generalist outsider CEOs make cash-holding adjustments by reducing cash, but the coefficients of these two variables suggest that the rate of reduction is higher for generalist outsider CEOs than for specialist outsider CEOs. One probable explanation for these results is that specialist outsider CEOs, due to having advanced education, professional certification, and industry experience, can better identify the times when firms' cash holdings need more or less adjustment than generalist outsider CEOs. Therefore, the results of Models 1 and 2 of Table 8 further confirm the results of our main analysis reported in Table 4.

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[43] Detailed definitions of Spec_Outsider and Gen_Outsider are provided in section 3.3.2. Similarly, Spec_Insider is a dummy variable equal to "1" if the CEO is a specialist–insider and "0" otherwise. Gen_Insider is also a dummy variable equal to "1" if the CEO is a generalist–insider and "0" otherwise. Definitions of all the variables are given in Appendix A.

Table 8: Generalist–specialist perspective on outsider–insider CEO attributes

Dependent variable: Cash/Net Assets				
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Spec_Outsider	-0.0078**			
	(-2.5302)			
Gen_Outsider		-0.0100*		
		(-1.8730)		
Spec_Insider			0.0157***	
			(5.0102)	
Gen_Insider				0.0001
				(0.0147)
CEO Gender	0.0279***	0.0278***	0.0284***	0.0339*
	(3.0429)	(3.0810)	(3.0335)	(1.8045)
CEO Age (log)	-0.0515***	-0.0433***	-0.0380***	-0.0437*
	(-4.5151)	(-3.7805)	(-3.2376)	(-1.7265)
CEO Tenure (log)	0.0094***	0.0059***	0.0067***	0.0149***
	(4.3540)	(2.7437)	(2.9782)	(2.9914)
Board Size (log)	0.0320***	0.0313***	0.0330***	0.0271**
	(6.0686)	(5.9325)	(6.0013)	(2.2822)
Co-Opted Director (log)	-0.0103***	-0.0087***	-0.0136***	-0.0128**
	(-4.8832)	(-3.9882)	(-6.2203)	(-2.5671)
% Board Independence	0.0247***	0.0236***	0.0246***	0.0302*
	(3.2319)	(3.0453)	(3.1540)	(1.8895)
Board Meetings (log)	0.0087***	0.0076***	0.0101***	0.0148**
	(3.5329)	(3.0615)	(3.9525)	(2.4719)
% Board Outsider	-0.0355***	-0.0330***	-0.0421***	-0.0265
	(-3.1049)	(-2.8958)	(-3.5946)	(-1.2006)
Firm Size (Log)	-0.0057***	-0.0064***	-0.0082***	-0.0097***
	(-3.3472)	(-3.7500)	(-4.6814)	(-2.8209)
ROE	-0.1114***	-0.1115***	-0.1131***	-0.1127***
	(-30.5083)	(-30.4382)	(-30.9220)	(-29.5951)
Debt to Equity	0.0433***	0.0410***	0.0412***	0.0543***
	(16.9454)	(14.7504)	(15.4859)	(11.9349)
Market to Book	0.0229***	0.0227***	0.0226***	0.0163***
	(22.8778)	(22.2670)	(22.8462)	(12.1561)
Dividend Pay	-0.0124***	-0.0127***	-0.0118***	-0.0061
	(-3.1234)	(-3.0709)	(-2.9424)	(-0.7180)
R&D/Total Assets	-0.0297***	-0.0291***	-0.0295***	0.0017
	(-2.6631)	(-2.6138)	(-2.6202)	(0.0969)
CAPEX (log)	-0.0174***	-0.0167***	-0.0143***	-0.0173***
	(-14.6224)	(-14.0862)	(-10.8967)	(-7.8524)
WC/Total Revenue	-0.0065***	-0.0069***	-0.0076***	-0.0065***
	(-9.2093)	(-9.9831)	(-11.0944)	(-5.5705)
Cash Flow/Total Assets	0.1893***	0.1911***	0.1997***	0.1725***
	(16.1313)	(16.1522)	(16.1585)	(10.5285)
Cash Flow Volatility	0.3488***	0.3452***	0.3617***	0.3514***
	(15.0274)	(14.7412)	(15.5770)	(11.5713)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Constant	0.5961***	0.5775***	0.5445***	0.6645***
	(12.3181)	(11.8784)	(11.0409)	(6.2306)
Observations	9,609	9,609	9,609	9,609
Wald chi^2 (41)	9278.78	8782.65	7194.53	3308.96

This table reports the regression result of generalist–specialist perspective on outsider–insider CEO attributes. Reported t-values are based on standard errors adjusted for heteroscedasticity across panels and correction for cross-sectional correlation by implementing GLS regression model. All regressions include year and industry effects. Spec_Outsider is a dummy variable equal to "1" if the CEO is a specialist–outsider and "0" otherwise. Gen_Outsider is also a dummy variable equal to "1" if the CEO is a generalist–outsider and "0" otherwise. Similarly, Spec_insider is a dummy variable equal to "1" if the CEO is a specialist–insider and "0" otherwise. Gen_insider is also a dummy variable equal to "1" if the CEO is a generalist–insider and "0" otherwise. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used are presented in Appendix A.

Model 3 of Table 8 presents the regression results between our cash holdings measure and Spec_Insider. It indicates a positive and statistically significant relationship at the 1% level between Spec_Insider and the cash holdings measure, suggesting that insider CEOs keep greater cash reserves. Model 4 of Table 8 reports the results from the regression analysis between the cash holdings measure and Gen_Insider. We find a positive coefficient, but the result is not statistically significant. Therefore, the sign and magnitude of Models 3 and 4 of Table 8 are also consistent with the result of CEO Insider reported in Table 7.

3.6 Dealing with endogeneity

We undertake a number of tests in our main analysis and employ the investment and tunnelling perspectives on cash. Furthermore, we use alternative measures of the dependent variable as well as a number of additional tests to confirm and verify further our main results. The results of our analyses suggest a negative relationship between corporate cash holdings and outsider CEOs. However, the statistical significance, sign, and magnitude of these tests may be biased if CEO Outsider, which is the variable of interest of our study, is correlated with the error term. Therefore, endogeneity bias can cause inconsistent estimates, leading to incorrect inferences and misleading conclusions. In this study, we consequently address each potential endogeneity issue by undertaking additional econometric analyses. We discuss each potential endogeneity issue first before addressing the issues in subsequent sections. The first endogeneity concern is omitted variable bias. This concern may arise due to the omission of variables that are supposed to be included in the vector of independent variables that may affect corporate cash holdings. This omission may also occur due to the absence of direct observability of those variables. The second concern is simultaneity/reverse causality/self-selection bias. An argument may arise regarding whether the outsider CEO causes the effects on corporate cash holdings or vice versa. Simultaneously, an organization may appoint or promote certain types of CEOs or certain types of CEOs may self-select into certain organizations with certain cash-holding characteristics. In our context, certain CEOs may be chosen based on their characteristics to align with the organizational financial policy, creating a matching problem. The third endogeneity concern is measurement error, which may arise through improper measurement of the variables due to the nature of their non-observability and differences in scale. The dependent variable of

this study is the ratio of cash to net assets. Therefore, firms with a higher cash ratio may be considered to have higher liquidity than firms with a lower cash ratio. Furthermore, firms' cash can be deflated by their net assets, total assets, or total revenue. Since the operationalization of the cash ratio is not based on only one method, its estimation may pose a measurement error problem. The fourth concern is unobserved panel heterogeneity, which may arise when the data set uses panel data containing observations on cross-sectional units, such as firms or industries, over time (Coakley et al., 2006). The nature of the data may create a variety of unobserved heterogeneity in regression models. The final concern in this study is the effect of the appointment of an outsider CEO following an insider predecessor on cash holdings as well as the effect of the appointment of an insider CEO following an insider predecessor on cash holdings. To deal with these endogeneity matters and following the prior literature (Florackis & Sainani, 2018; Hardies, Breesch, & Branson, 2015; Liu & Mauer, 2011; Liu et al., 2014; Sultana et al., 2019; Veprauskaitė & Adams, 2013), we use four econometric techniques, specifically two-stage least squares (2SLS), propensity score matching (PSM), the two-step system generalized method of moments (GMM), and difference-in-differences (DID). The following sections discuss in detail how these four econometric techniques operationalize and mitigate the endogeneity concern outlined above.

3.6.1 Two-stage least squares (2SLS)

One identification method to reduce endogeneity concerns is to use an instrumental variable technique. As such, the first econometric technique that we employ is 2SLS, which addresses causality and endogeneity concerns by using instrumental variables. Accordingly, we need an instrumental variable that is not correlated with the error term but influences the independent variable. In the corporate governance literature, it is challenging to find a variable on the basis of the existing economic theory that predicts CEO outsiders but not corporate cash holdings. However, Roberts and Whited (2013) suggest that biological or physical events or features can be a good source for a valid and good instrument, because this kind of biological event is unlikely to affect firm-level variables, for example, corporate cash holdings.

Table 9: Two-stage least squares (2SLS)

Variables	CEO Outsider	Cash/Net Assets
	First Stage	Second Stage
CEO Birth	0.1219***	
	(3.9133)	
CEO Outsider		-0.4021**
		(-2.3701)
CEO Gender	-0.0537**	0.0172
	(-2.0302)	(0.7193)
CEO Age (log)	-0.0586	-0.0782**
	(-1.5258)	(-2.2580)
CEO Tenure (log)	-0.0273***	0.0037
	(-3.7175)	(0.4925)
Board Size (log)	0.2983***	0.1439***
	(17.0247)	(2.7698)
Co-Opted Director (log)	-0.2494***	-0.1131***
	(-33.2007)	(-2.6710)
% Board Independence	0.1850***	0.1391***
	(8.7711)	(3.8506)
Board Meetings (log)	-0.0034	0.0157**
	(-0.3855)	(2.2758)
% Board Outsider	0.1228***	0.0100
	(3.8283)	(0.3036)
Firm Size (Log)	-0.0139***	-0.0147***
	(-2.6709)	(-2.9826)
ROE	-0.0053	-0.1154***
	(-0.9068)	(-13.9510)
Debt to Equity	-0.0144**	0.0476***
	(-2.1037)	(5.3794)
Market to Book	0.0012	0.0172***
	(0.5825)	(8.2468)
Dividend Pay	-0.0853***	-0.0453**
	(-6.7468)	(-2.5699)
R&D/Total Assets	0.0120	0.0148
	(0.4754)	(0.6161)
CAPEX (log)	-0.0007	-0.0176***
	(-0.2147)	(-6.0787)
WC/Total Revenue	-0.0004	-0.0068***
	(-0.2330)	(-4.4844)
Cash Flow/Total Assets	-0.0178	0.1651***
	(-0.7062)	(6.3769)
Cash Flow Volatility	0.0525	0.3734***
	(1.0832)	(8.2351)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Constant	0.8429***	1.0889***
	(5.3270)	(4.9164)
Observations	9,609	9,609
R-squared		0.4083
Underidentification Test		
Kleibergen–Paap rk LM statistic		14.927
p-value		0.000
Weak Identification Test		
Corrected Cragg–Donald Wald F statistic		17.977
Stock and Yogo (2005) 10% maximal IV size (critical value)		16.38
Test of Overidentifying Restrictions		
Hansen's J-statistic		Exactly identified

This table presents the results of the two-stage least squares (2SLS) regression between CEO outsider and cash holdings. In first stage, we obtain the predicated value of the endogenous independent variable from regressing the endogenous independent variable on the instrumental variable. In second stage, we run our main models of the dependent variables on the exogenous independent variable and the predicated value obtained from the first stage regression in lieu of observations on the endogenous variables. We also include the year effect and industry effect in our regression model. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

The success of the instrumental variable approach also largely depends on how effectively the instrumental variable can isolate the causal effect of outsider CEOs on corporate cash holdings. Following Cline and Yore (2016) and Serfling (2014), we also consider the year when the CEO was born as the starting point for the selection of our instrumental variable. Therefore, we create a dummy variable named "CEO Birth", which is equal to "1" if the CEO was born in the 1970s or later and "0" otherwise. The 1970s is a notable decade for the advancement of technology. First, the commercial production of the personal computer started in this decade (Bayus, 1998), and, second, the information technology revolution took place in the 1970s (Greenwood & Jovanovic, 1999). Therefore, CEOs who were born in or after the 1970s may have a greater orientation towards technology than CEOs who were born before the 1970s. Therefore, it is possible that technologically advanced CEOs are more comfortable using technology, specifically social media platforms and internet communication platforms, to build and maintain their external and internal professional relationships, thereby strengthening their networks. According to economic theory, our newly constructed dummy variable possibly meets the conditions needed to be a valid instrument. First, this variable is highly correlated with CEO Outsider. Second, following Serfling (2014), we suggest that there is no reason to believe that the 1970s decade or afterwards, when the CEOs were born, is correlated with corporate cash holdings except through its effects via CEO Outsider. Consequently, the predicted relationship between CEO Outsider and CEO Birth should be positive.

Model 1 and Model 2 of Table 9 report the 2SLS regression results. In the first stage, reported in Model 1, we obtain the predicted value of the endogenous independent variable from regressing the endogenous independent variable on the instrumental variable and find a positive relationship, consistent with our conjecture. In the second stage, reported in Model 2, we run our main model of the dependent variables on the exogenous independent variable and the predicted value obtained from the first-stage regression in lieu of observations of the endogenous variables. After including the instrumental variable, the relationship between CEO Outsider and the cash holdings model is negative and statistically significant at the 5% level. Following Larcker and Rusticus (2010), we perform several tests to evaluate the validity of the instrument. To identify the presence of a weak instrument, our weak instrument test reports that the omitted instrument is correlated with the endogenous independent

variable, because the corrected Cragg–Donald Wald F statistic (17.977) is greater than the Stock and Yogo (2005) benchmark value (i.e. 16.38) at the 10% level. We also perform Hansen's overidentifying restrictions test and find that the equation is exactly identified ($p = 0.000$) because we use one instrument. The result also indicates that the instrument is not correlated with the error term and properly excluded from the second-stage regression, reflecting the validity of the instrument used for our 2SLS regression. Furthermore, we perform an underidentification test (LM statistic), the result of which suggests that the omitted instrument is relevant.

3.6.2 Propensity score matching

To address the endogenous outsider CEO–firm matching concern discussed in section 6, we undertake propensity score matching (PSM) in this study, as suggested by Rosenbaum and Rubin (1983). To obtain unbiased estimates, it is important to specify the relationship between corporate cash holdings and outsider CEOs properly in multiple regression analyses. If the relationship between the dependent variable and the independent variable is not properly specified, it generates a problem called "functional form misspecification" (FFM). Rosenbaum and Rubin (1983) suggest that PSM can alleviate this concern by decreasing the dependency on the specification of the relationship between variables. In PSM, observations are chosen from the treatment and control groups on a number of criteria using the estimated possibility of receiving treatment to compare the corporate cash holdings between the two groups of firms.

We implement the PSM procedure in two stages. First, we create a treatment group and a control group from our independent variables. As our independent variable is the dummy variable, we include the effect of CEO multiple directorships to construct our treatment group and control group. Prior studies (Booth & Deli, 1996; Geletkanycz & Hambrick, 1997) suggest that top executives' external networks affect the organizational policy formulation strategy and performance by enabling them to learn different styles of management and strategies used in other firms. Among the external relationships, the directorship network is considered to be one of the benefits to the firm (Geletkanycz et al., 2001). Pfeffer (1991) argues that directorate ties provide greater access to external information and opportunities. Therefore, CEOs with multiple directorships enable them to establish and strengthen their external networks

better than CEOs without multiple directorships (Loderer & Peyer, 2002). Similarly, outsider CEOs bring their established external networks to the firm (Parrino, 1997). Because of the commonality discussed above, we consider the perspective of CEOs' multiple directorships to construct our treatment group and control group for PSM analysis. We create a dummy variable, CEO_Out_Multiple, which is equal to "1" if the CEO is an outsider and has directorships on multiple boards and "0" otherwise. By implementing this isolation technique, we create a treatment group of outsider CEOs with multiple directorships and vice versa for the control group. Subsequently, we implement the PSM procedure in two stages. In the first stage, we run a logistic regression by pooling the treatment and control groups and calculate the propensity scores for each firm-year observation.[44]

In the logistic model, we include CEO Tenure (log), % Board Outsider, the ratio of interdependent directors to the board size, Firm Size, Cash Flow to Total Assets, and industry and year effects to calculate the propensity score. In the second stage, we use the calculated propensity score to match each outsider CEO with multiple directorships with an outsider CEO without multiple directorships. During this stage, we use the nearest-neighbour matching technique without replacement subject to the caliper (i.e. the maximum difference in propensity score between the control group and the treatment group) of 0.01, as suggested by Leuven and Sianesi (2003), and we find 1,550 matches for outsider CEOs with multiple directorships with outsider CEOs without multiple directorships. Our final panel for PSM includes 2,534 observations, as reported in Model 1 of Table 10.

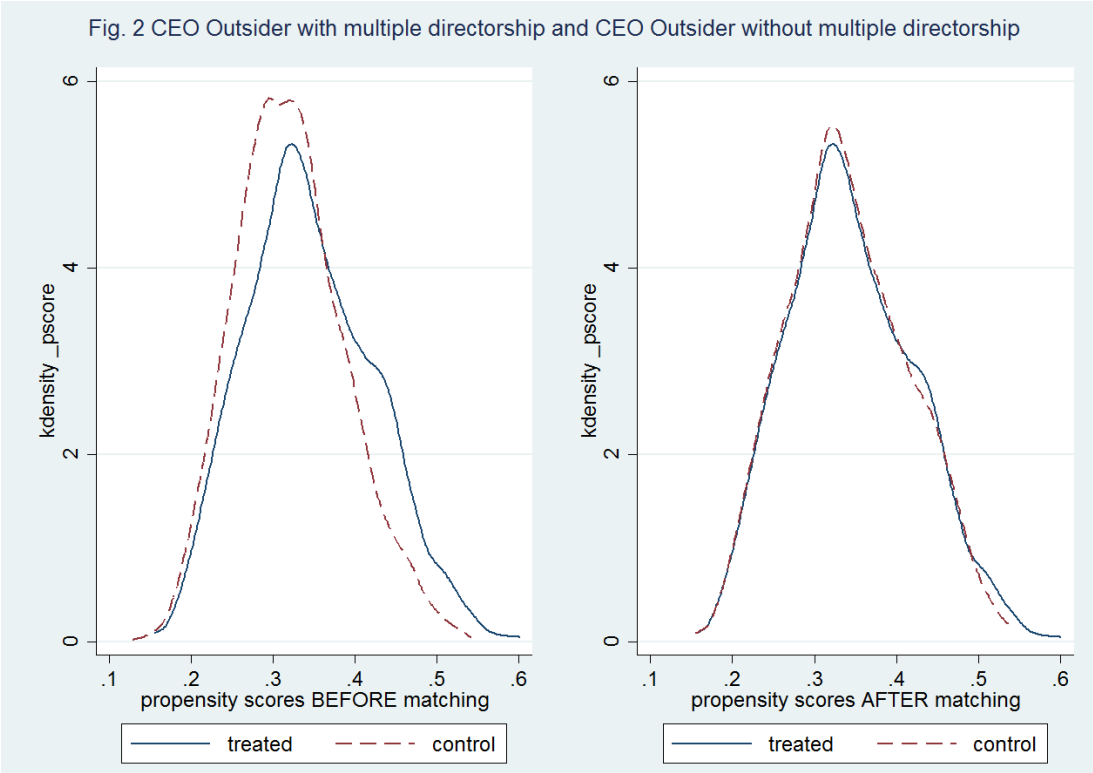
[44] We also conduct a covariate balance test (unreported) to verify that the firms in the treatment and control groups are identical in terms of observable characteristics. We find that none of the differences between the firms' observable characteristics in the treatment and control groups are statistically significant.

Table 10: Propensity score matching (PSM) and two-step system generalized method of moments (GMM)
Dependent variable: Cash/Net Assets

Variables	PSM	PSM	GMM
	Model 1	Model 2	Model 3
Cash/ Net Assets$_{(t-1)}$			0.6013***
			(8.5007)
CEO Outsider	-0.0104**	-0.0346***	-0.1494**
	(-2.3301)	(-9.3645)	(-2.4606)
CEO Gender	0.0883***	0.0071	0.0421
	(4.5607)	(0.5439)	(0.8187)
CEO Age (log)	0.0698***	0.0018	-0.0110
	(3.7016)	(0.1221)	(-0.1527)
CEO Tenure (log)	0.0017	0.0072**	0.0942***
	(0.4960)	(2.4267)	(2.7988)
Board Size (log)	0.0069	0.0697***	0.1331*
	(0.7469)	(7.8526)	(1.8778)
Co-Opted Director (log)	-0.0206***	-0.0272***	-0.0827**
	(-6.5581)	(-8.9397)	(-2.5100)
% Board Independence	0.0579***	0.0420***	-0.1153
	(5.5443)	(3.8832)	(-1.2156)
Board Meetings (log)	0.0146***	0.0107***	0.0152
	(3.0784)	(2.7175)	(0.5236)
% Board Outsider	0.0150	-0.0245	-0.2105**
	(0.8001)	(-1.5097)	(-2.1130)
Firm Size (Log)	-0.0172***	-0.0191***	0.0216
	(-6.0743)	(-7.3497)	(1.0420)
ROE	-0.1211***	-0.0858***	-0.2067***
	(-20.8109)	(-16.3950)	(-6.7946)
Debt to Equity	0.0595***	0.0492***	-0.0365
	(11.8711)	(11.0819)	(-1.2508)
Market to Book	0.0179***	0.0133***	0.0176**
	(11.3333)	(8.5324)	(2.0938)
Dividend Pay	-0.0356***	-0.0519***	0.0056
	(-5.1228)	(-8.3879)	(0.1533)
R&D/Total Assets	0.0240	0.0913***	0.0028
	(1.4718)	(3.9602)	(0.0505)
CAPEX (log)	-0.0058***	-0.0083***	-0.0249**
	(-2.7885)	(-4.4607)	(-2.2045)
WC/Total Revenue	-0.0064***	-0.0029***	-0.0108
	(-5.3888)	(-2.6457)	(-1.5065)
Cash Flow/Total Assets	0.1616***	0.1866***	0.1583
	(8.2861)	(9.5442)	(1.4600)
Cash Flow Volatility	0.2974***	0.3541***	-0.2822**
	(7.7176)	(10.6438)	(-2.0947)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	No
Constant	0.2224***	0.4723***	0.0364
	(2.8276)	(7.4515)	(0.1112)
Observations	2,534	2,388	9,069
Wald chi2(41)	3140	5842.98	
Hansen (p-value)			55.62 (0.763)
Diff-Hansen (p-value)			39.79 (0.729)
AR 1 (p-value)			-8.21 (0.000)
AR 2 (p-value)			0.97 (0.330)
Groups (Instruments)			1166 (100)

This table reports the results from PSM and GMM analysis used in this study. Model 1 represent the result of PSM between the treatment (CEO is an outsider and has directorships on multiple boards) and control (CEO is an outsider and has no multiple directorships) groups. Model 2 represent the result of PSM between the treatment (CEO is an outsider and has directorships on multiple boards) and control (CEO is an insider and has multiple directorships on board) groups. Model 3 reports the results of the GMM estimators of CEO outsider and cash holdings model. By implementing the two-step system GMM estimators, we better control different sources of endogeneity in this study namely omitted variables bias, measurement errors, unobserved panel heterogeneity, simultaneity and dynamic endogeneity as suggested by Ullah et al. (2018). The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Figure 2 of this study graphically presents the treatment group (solid blue line) and control group (red dashed lines) based on the propensity score before matching and after the matching has taken place.

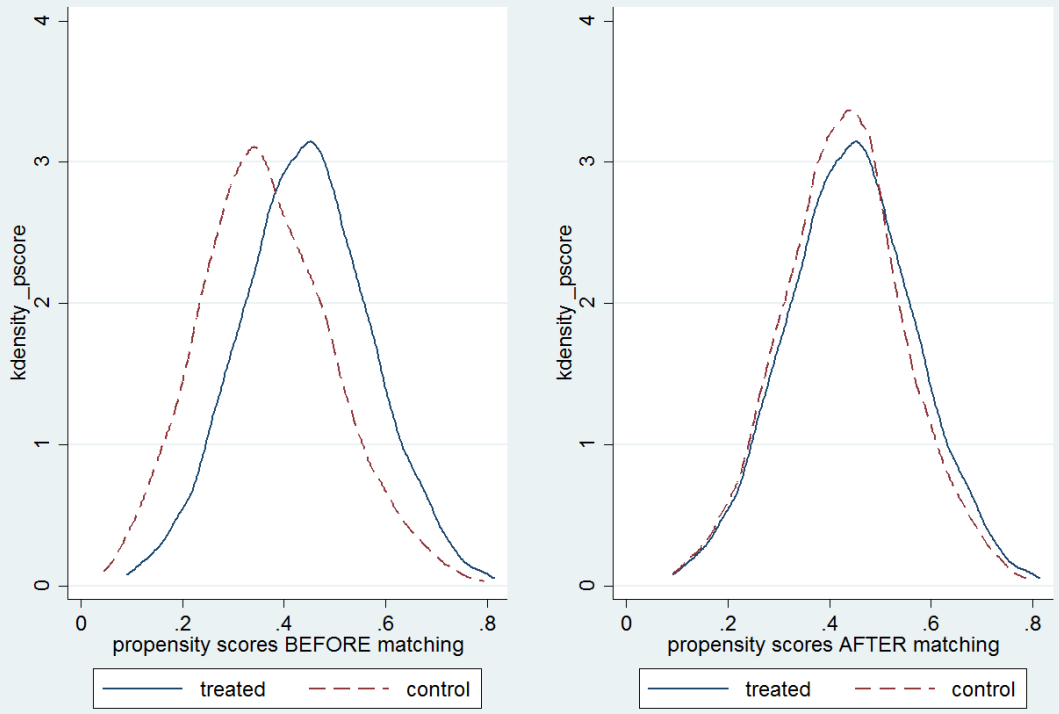


Model 1 of Table 10 reports the propensity score matching results of the control group and treatment group (outsider CEOs without multiple directorships and outsider CEOs with multiple directorships). After matching outsider CEOs with multiple directorships with outsider CEOs without multiple directorships, we find that the relationship between outsider CEOs and corporate cash holdings is negative. The result is also statistically significant at the 5% level. The results suggest that outsider CEOs with multiple directorships hold more cash than outsider CEOs without multiple directorships.

Subsequently, to confirm our PSM result further, we also consider insider CEOs to construct our control group and treatment group. We create a dummy variable, CEO_Out_Multiple_2, which is equal to "1" if the CEO is an outsider and has directorships on multiple boards and "0" if the CEO is an insider and has directorships on multiple boards. By implementing this isolation technique, we create a treatment group of outsider CEOs with multiple directorships and insider CEOs with multiple directorships for our control group. Subsequently, we implement the PSM

procedure in two stages. In the first stage, we run a logistic regression by pooling the treatment and control groups and calculate the propensity scores for each firm-year observation.[45] In the logistic model, we include the same firm and corporate governance characteristic, specifically CEO Tenure (log), % Board Outsider, the ratio of interdependent directors to board size, Firm Size, Cash Flow to Total Assets, and industry and year effects, to calculate the propensity score. In the second stage, we use the calculated propensity score to match each outsider CEO with multiple directorships with each insider CEO with multiple directorships. During this stage, we use the nearest-neighbour matching technique without replacement subject to the caliper (i.e. the maximum difference in propensity score between the control group and the treatment group) of 0.01, as suggested by Leuven and Sianesi (2003), and we find 1,469 matches for outsider CEOs with multiple directorships with insider CEOs with multiple directorships. Our final panel for PSM includes 2,388 observations, as reported in Model 2 of Table 9.

Fig. 3 CEO Insider with multiple directorship and CEO Outsider with multiple directorship



[45] We also conduct a covariate balance test (unreported) to verify that the firms in the treatment and control groups are identical in terms of observable characteristics. We find that none of the differences between the firms' observable characteristics in the treatment and control groups are statistically significant.

Figure 3 of this study graphically presents the treatment group, that is, outsider CEOs with multiple directorships (solid blue line), and the control group, that is, insider CEOs with multiple directorships (red dashed lines), based on the propensity score before the matching and after the matching has taken place.

Model 2 of Table 10 reports the propensity score matching results of our control (insider CEOs with multiple directorships) and treatment group (outsider CEOs with multiple directorships). After matching outsider CEOs with multiple directorships with insider CEOs with multiple directorships, we find a negative and statistically significant (at the 5% level) association between outsider CEOs and corporate cash holdings. The coefficients for Model 1 and Model 2 of Table 10 indicate that, when the matching takes place between insider CEOs with multiple directorships and outsider CEOs with multiple directorships, the appointment of an outsider CEO reduces cash more than others. Hence, these results further confirm the findings from our main model by mitigating the above-mentioned econometric concerns. Therefore, we mitigate the endogeneity that may arise from the CEO firm matching concern by implementing the PSM technique in two dimensions.

3.6.3 Two-step system generalized method of moments (GMM) estimator

Ullah et al. (2018) suggest that the GMM estimator can address different sources of endogeneity, namely unobserved panel heterogeneity, simultaneity, and dynamic endogeneity, from the other econometric technique.[46] It also addresses omitted variable bias and measurement error concerns. Arellano and Bover (1995) and Blundell and Bond (1998) state that the system GMM estimator is able to correct the aforesaid endogeneity concerns. In this study, we use the two-step system GMM estimator, because Roodman (2009) suggests that this estimator is more robust and

[46] Unobserved panel heterogeneity arises when the dataset uses panel data containing observations on cross-sectional units, such as firms or industries, over time (Coakley et al., 2006). Additionally, our study may omit some variables that are not included within the set of control variables affecting the cash holdings. Furthermore, the omission may occur due to the absence of direct observability of those variables. In our study, CEOs appointed from outside the firm may choose only those firms that have the intention to hold less cash. Likewise, firms that have a policy to keep low cash reserves can also recruit CEOs from outside. These may bias our result by postulating simultaneous causality. The dependent variable of this study and the vector of the independent variables may also have some measurement error (discussed in section 6). Therefore, two-step system GMM can alleviate this problem.

efficient in correcting heteroscedasticity and autocorrelation. Furthermore, the two-step system GMM estimator can control the dynamic relationship between the current values of the independent variable, that is, CEO Outsider, and the past values of corporate cash holdings (see(Wintoki et al., 2012).

Model 3 of Table 10 presents the results of the two-step system GMM estimator. To confirm the absence of second-order serial correlation with the error term, we run the Arellano–Bond test. To obtain a consistent GMM estimator in the dynamic panel model, the error term should not be correlated with the error term over time. Model 3 of Table 10 reports that the *p-value* in the first test (AR(1)) is 0.000. Therefore, it rejects the null hypothesis, but the null hypothesis cannot be rejected in the second test (*p-value* = 0.330) (AR(2)), showing no evidence that the errors are correlated over time. Subsequently, we run the *Hansen J-test* to determine the validity of the instrumental variables, and the test yields a *p-value* (0.763) greater than 5%. Therefore, the *Hansen J-statistic* indicates that we cannot reject the null hypothesis, so our instruments are valid (Hansen, 1982). To confirm the validity of the additional instrument used in the system GMM estimator, we run the *Diff-Hansen test* and the result yields a *p-value* of 0.729, meaning that we cannot reject the null hypothesis. Therefore, the test confirms the validity of the additional instruments. To test the dynamic nature of the outsider CEO and corporate cash holdings model, we use a lagged dependent variable in the system GMM estimator. The result of Model 3 in Table 10 does not reject the dynamic nature of our outsider CEO and cash holdings model, as the estimated coefficient of our lagged dependent variable is statistically significant at the 1% level. Subsequently, we find that the coefficient of CEO Outsider has a negative sign and is statistically significant at the 5% level, indicating that the result of the two-step system GMM estimator also confirms our result reported in Table 4.

3.6.4 Difference-in-differences (DID)

Following Hardies et al. (2015) and Sultana et al. (2019), we also implement the DID methodology to reduce the concern of unobservable omitted variable bias further. The effect of outsider CEOs on corporate cash holdings can be examined by adopting a “quasi-natural” method to answer the question of whether firms’ level of cash holdings changes after the appointment of an outsider CEO. DID estimators allow

us to compare changes in firms' cash holdings by constructing a treatment group and a control group from our sample of CEO appointment changes. We implement the DID analysis in several steps. First, from our sample, we identify the CEO appointment changes. If the newly appointed CEO is appointed from outside the organization and the predecessor was appointed from within the organization, we term these changes "Insider to Outsider" and assign a value of "1" in every year in which this CEO appears in the sample after the changes. This is the treatment group of the DID estimator. There are 557 switches taking place within our sample from insider CEO to outsider CEO, and the number of final observations is 2,143. Subsequently, if the new CEO is appointed from inside the organization and the predecessor was also appointed from inside the organization, we term these changes "Insider to Insider" and assign a value of "0" in every year in which he/she appears in the sample after the changes. This is the control group of the DID estimator. Within our sample, 614 switches take place from insider CEO to insider CEO, and the number of final observations is 2,775. Second, to match the treatment group with the control group, we use the propensity score matching technique. In the logistic model, we include CEO Age (log), CEO Tenure (log), % Board Outsider, Market to Book, R&D to Total Assets, Cash Flow to Total Assets, and industry and year effects to calculate the propensity score.[47] Therefore, we use the calculated propensity score to match each "Insider to Outsider" CEO with each "Insider to Insider" CEO. During this stage, we use the nearest-neighbour matching technique without replacement subject to the caliper (i.e. the maximum difference in propensity score between the control group and the treatment group) of 0.05, as suggested by Leuven and Sianesi (2003), and we find 1,785 matches for our treatment group and control group. Finally, to test whether there was a pre–post effect of an "Insider to Outsider" CEO switch, we estimate equation (6) for the pooled sample of CEO appointments:

$$\Delta\ Cash/\ NetAssets_{i,t} = \beta_0 + \beta_1\ \Delta CEO\ Insider\ to\ CEO\ Outsider_{\ i,t} + [\Delta Control\ Variables] + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad (6)$$

[47] We also conduct a covariate balance test (unreported) to verify that firms in the treatment and control groups are identical in terms of observable characteristics. We find that none of the differences between the firms' observable characteristics in the treatment and control groups are statistically significant.

where Δ is the difference between the level of each variable in year *t* and the level in year *t-1*.[48] The intercept β_0 reported in equation 6 represents the average change in firms' level of cash holding, controlling for changes in other characteristics (i.e., a change from an insider to another insider CEO), and the coefficient β_1 on Δ*CEO Insider to CEO Outsider* represents the incremental change as a result of switching from an insider to an outsider CEO.

Table 11 reports the result of the DID estimator of this study. We find that the association between ΔCash/Net Assets and ΔCEO Insider to CEO Outsider is negative and statistically significant (*t-stat. = -2.5739*) at the 5% level. As such, compared with insider CEOs, outsider CEOs decrease firms' cash-holding level significantly more following CEO appointment switches. Thus, the result of this analysis indicates a causal effect of outsider CEOs on corporate cash holdings.

[48] The model consequently uses each firm as its own control.

Table 11: Difference-in-differences (DID)

Variables	Δ Cash/Net Assets
Δ CEO Insider to CEO Outsider	-0.0066**
	(-2.5739)
CEO Gender	0.0180**
	(2.3040)
Δ CEO Age (Log)	-0.0520***
	(-4.8856)
Δ CEO Tenure (Log)	0.0077***
	(3.6305)
Δ Board Size (Log)	0.0206***
	(3.4221)
Δ Co-Opted Director (log)	0.0055**
	(2.5073)
Δ % Board Independence	0.0256***
	(3.7720)
Δ Board Meetings (log)	0.0139***
	(4.2932)
Δ % Board Outsider	-0.0093
	(-0.8247)
Δ Firm Size (Log)	-0.0234***
	(-6.0620)
Δ ROE	-0.0958***
	(-28.0720)
Δ Debt to Equity	0.1113***
	(25.8181)
Δ Market to Book	0.0103***
	(9.0180)
Dividend Pay	-0.0062**
	(-2.0314)
Δ R&D/Total Assets	0.0300
	(1.6362)
Δ CAPEX (log)	-0.0215***
	(-18.5706)
Δ WC/Total Revenue	-0.0045***
	(-7.6576)
Δ Cash Flow/Total Assets	0.2684***
	(21.7561)
Δ Cash Flow Volatility	0.1418***
	(6.8493)
Year effects	Yes
Industry effects	Yes
Constant	0.0332***
	(5.9348)
Observations	2,816
Wald chi^2 (40)	6632.47

This table present the DID result when CEO change taken place from insider to outsider and insider to insider. To implement DID, we constructed a new dummy variable Δ CEO Insider to CEO Outsider. If the newly appointed CEO is appointed from outside the organization and the predecessor was appointed from within the organization, we term these changes "Insider to Outsider" and assign a value of "1". If the new CEO is appointed from inside the organization and the predecessor was appointed from inside the organization, we term these changes "Insider to Insider" and assign a value of "0". Reported t-values are based on standard errors adjusted for heteroscedasticity across panels and correction for cross-sectional correlation by implementing GLS regression model. All regressions include year and industry effects. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

3.7 Conclusion

Motivated by past literature, media reports and current practices which suggest that outsider CEOs are bringing a much-needed skillset to hiring firms, we examine whether such outside CEOs hold greater cash reserves compared to internal CEOs. It is clear that the right choice of CEO is critical to the strategic operations of a firm and corporate financing policy is one such area which CEOs largely focus on. Within corporate financing policy, cash holdings are an important component given its liquidity and ability to provide a buffer and resilience to adverse economic events. Given that CEOs may choose to stockpile their cash reserves or to spend it, we use a sample of 9,609 Australian firm-year observations from 2001 through to 2015 and find that outsider CEOs are significantly associated with lower levels of cash holdings suggesting possibly their confidence to (1) raise external funds (2) at cheaper rates due to their reputations in the marketplace and having an established external network.

Our finding triggers a number of secondary questions; the first of which is where surplus cash reserves are used and second, how long this occurs for? We find that outsider CEOs reduce firm cash holdings during the year of their appointment and increase capital expenditure in the subsequent year in efforts to increase firm value possibly to justify their appointment. However, we find that this tunneling of cash to capital expenditure projects is temporary as outsider CEOs who stay with the firm for five years and more shift the tunneling of cash holdings from capital expenditure projects towards dividend payouts and we conjecture that this is consistent with the position that, as CEOs reach the end of their time with a firm, they seek to maximize their outgoing rewards structures and use dividend payouts to facilitate the increase in such reward structures due to them.

We undertake a number of additional tests; both robustness and econometric. We use three alternative measures of cash holdings and we also account for the fact that the generalist-specialist nature of the outsider CEO does not change our results. We also utilise four econometric techniques to mitigate the potential endogeneity concerns in our research. As a result, our findings not only extend the prior literature on cash holdings, insider and outsider CEOs and the life cycle of a CEO but our results have implications for a wide variety of market participants such as the board of directors when making CEO selection decisions, regulators when formulating rules

and regulations strengthening monitoring capabilities within firms and investors when making their investment selection decisions. In terms of future research, one possible avenue would be to assess whether internal monitoring mechanisms within firms such as an audit committee or external monitoring mechanisms such as institutional investors are able to moderate outsider CEOs' cash tunnelling actions.

3.8 Appendices

Appendix A: Data definitions

Variables	Definition
Dependent	
Cash/Net Assets	Ratio of cash to net assets where net assets = total assets – cash
Alternative Measures of Dependent	
Cash & Mkt Sec./Total Assets	Ratio of cash and marketable securities to total assets MS = QR X CL – CCE – AR MS = marketable securities QR = quick ratio CL = current liabilities CCE = cash and cash equivalent AR = accounts receivable
Cash & Mkt Sec./Net Assets	Ratio of cash and marketable securities to net assets where net assets = total assets – cash and marketable securities
Log (Cash/Net Assets)	Natural log of the ratio of cash to net assets
Independent	
CEO Outsider	An executive who becomes CEO at the time of joining or within three months of joining; he or she is considered as an outsider CEO and takes the value "1" in every year in which he or she appears in the sample. However, if an executive functions in other roles in the organization and is promoted to the role of CEO afterwards, he or she is considered as a non-outsider CEO or an insider CEO and takes the value "0" in every year in which he or she appears in the sample
Spec_Outsider	Dummy variable equal to "1" if the CEO is a specialist outsider and "0" otherwise
Gen_Outsider	Dummy variable equal to "1" if the CEO is a generalist outsider and "0" otherwise
CEO Outsider ≤ 5	Dummy variable equal to "1" if the CEO was recruited from outside the firm and stayed with the firm for no less than five years and "0" otherwise
Corporate Governance Characteristics	
CEO Gender	Dummy variable equal to 1 if the CEO is female and 0 otherwise
CEO Age	Natural log of the CEO age, where CEO age is the age of the CEO in years
CEO Tenure	Number of years that the CEO has spent as the CEO in the firm
Board Size	Number of members sitting on the board of directors
Co-Opted Director	Number of interdependent directors divided by the total number of directors of the firm. Interdependent directors are those who are appointed by the CEO. A higher ratio of interdependent directors on the board refers to CEOs with greater power
% Board Independence	Ratio of independent directors to total directors of the firm
Board Meetings	Total number of board meetings held during the year
% Board Outsider	Ratio of outside directors on the board of directors. Board outsiders are all board members who are not employees of the firm
Firm Characteristics	
Firm Size	Natural log of the book value of the total assets
ROE	Net income divided by the total shareholders' equity
Debt to Equity	Total debt divided by the total shareholders' equity
Market to Book	(The book value of assets minus the book value of equity plus the market value of equity) divided by the book value of assets
Dividend Pay	Dummy variable equal to 1 if the firm pays dividends and 0 otherwise
R&D/Total Assets	Research and development (R&D) expenses divided by the total assets. Firms that do not report R&D expenses are considered to be firms with no R&D expenses
CAPEX	Natural log of capital expenditure, defined as the ratio of capital expenditures to total assets
WC/Total Revenue	Working capital divided by the total revenue
Cash Flow/Total Assets	Cash flow divided by the total assets
Cash Flow Volatility	Standard deviation of the firm's cash flow from operation scaled by the total assets over the prior three-year period
Industry_Dummy	Industry dummy according to the global industry classification standard
Year_Dummy	Year dummy according to the financial year end
ε	Error term

Appendix B: Ordinary least square (OLS) result between CEO Outsider and Cash Holdings

Variables	Cash/ Net Assets	Cash & Mkt Sec./ Total Assets	Cash & Mkt Sec./ Net Assets	Log (Cash/ Net Assets)
	Model 1	**Model 2**	**Model 3**	**Model 4**
CEO Outsider	-0.0224***	-0.0100**	-0.0645*	-0.0595*
	(-3.2752)	(-2.3863)	(-1.6729)	(-1.6708)
CEO Gender	0.0324*	0.0037	-0.1681	0.0990
	(1.7278)	(0.3180)	(-1.5879)	(1.0152)
CEO Age (log)	-0.0471*	-0.0317**	-0.0851	-0.2225*
	(-1.8646)	(-2.0442)	(-0.5967)	(-1.6883)
CEO Tenure (log)	0.0142***	0.0037	0.0275	0.0306
	(2.8559)	(1.1974)	(0.9778)	(1.1754)
Board Size (log)	0.0339***	0.0322***	0.1708**	0.3408***
	(2.8237)	(4.3789)	(2.5204)	(5.4403)
Co-Opted Director (log)	-0.0183***	-0.0129***	-0.0345	-0.0783***
	(-3.5273)	(-4.0498)	(-1.1771)	(-2.8896)
% Board Independence	0.0321**	0.0269***	0.1570*	0.3262***
	(2.0099)	(2.7486)	(1.7408)	(3.9133)
Board Meetings (log)	0.0146**	0.0128***	0.0777**	0.1289***
	(2.4409)	(3.4949)	(2.3000)	(4.1283)
% Board Outsider	-0.0232	-0.0269**	-0.0772	-0.3121***
	(-1.0486)	(-1.9846)	(-0.6183)	(-2.7077)
Firm Size (Log)	-0.0101***	-0.0105***	0.0520***	-0.1550***
	(-2.9292)	(-4.9774)	(2.6711)	(-8.5924)
ROE	-0.1127***	-0.0167***	-0.0545**	-0.1198***
	(-29.6244)	(-7.1684)	(-2.5402)	(-6.0332)
Debt to Equity	0.0540***	-0.0381***	-0.1094***	-0.3644***
	(11.8900)	(-13.6888)	(-4.2665)	(-15.3410)
Market to Book	0.0163***	0.0134***	0.0584***	0.1027***
	(12.1764)	(16.3917)	(7.7376)	(14.6156)
Dividend Pay	-0.0077	-0.0202***	0.0125	-0.2174***
	(-0.9102)	(-3.8785)	(0.2594)	(-4.9000)
R&D/Total Assets	0.0017	-0.0234**	-0.2603***	-0.0977
	(0.0974)	(-2.2007)	(-2.6605)	(-1.0844)
CAPEX (log)	-0.0173***	-0.0136***	-0.1635***	-0.0490***
	(-7.8564)	(-10.0840)	(-13.1485)	(-4.2671)
WC/Total Revenue	-0.0065***	-0.0040***	-0.0320***	-0.0320***
	(-5.5818)	(-5.6167)	(-4.8799)	(-5.2990)
Cash Flow/Total Assets	0.1722***	-0.0221**	-1.0951***	0.2692***
	(10.5167)	(-2.2015)	(-11.8516)	(3.1496)
Cash Flow Volatility	0.3521***	0.1919***	1.4504***	1.6059***
	(11.6032)	(10.3114)	(8.4682)	(10.1763)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Constant	0.6896***	0.6005***	1.6382***	1.0976**
	(6.4592)	(9.1772)	(2.7195)	(1.9740)
Observations	9,609	9,610	9,610	9,556
R-squared	0.2578	0.3265	0.2051	0.2863

This table reports the result of pooled ordinary least square (OLS) regression of cash holdings measure used in the main analysis and three alternative measure of cash holdings with CEO outsider. After excluding duplicate observations, observations related to the financial industry and real estate industry, and firms with missing values, 9609 firm-years have complete information at the CEO, board, and firm levels from 2001 to 2015. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

CHAPTER 4

CEO power, dividend policy and monitoring: An imputation tax environment

4.1 Introduction

Dividend policy is one of the most important corporate financing decisions for an organization to make. Prior literature identifies several factors that affect corporate dividend policy, including growth opportunity, tax rate, organizational structure, capital structure and financial flexibility (DeAngelo et al., 2006; Jordan et al., 2018; Twite, 2001). However, it still remains a big "puzzle" as to how firms choose between two alternatives: the propensity to pay a dividend and spending for investment or acquiring capital goods.

Agency theory (Easterbrook, 1984; Jensen, 1986) explains how a dividend is used as a tool to mitigate conflict between management and shareholders by addressing the principal–agent relationship. Specifically, the Chief Executive Officer (CEO) as the head of the management team plays an active and significant role in the financial decision-making process (Adams et al., 2005; Veprauskaitė & Adams, 2013). Additionally, in some firms, the decision is the result of the consensus of the top management, whereas in other firms, the distribution of decision-making power flows to the person whose position is most influential. Furthermore, Adams et al. (2005) hypothesize that powerful CEOs enjoy higher decision-making power and experience more variation in performance; consequently, these powerful CEOs may be less interested in compromising with other executives and board members in the decision-making process. This may bring more extreme decisions, either favourable or detrimental, to the organization. As such, CEO power is important in an organization's financial decision-making autonomy, but how CEO power affects corporate dividend policy when considering the monitoring mechanism is unknown. Using agency theory, this study examines the relationship between CEO power and dividend policy, including the moderation effect from internal and external monitoring mechanisms in an imputation tax environment.

In order to contribute to the literature regarding the unsolved puzzle of the propensity to pay a dividend, CEO power is focused on for several reasons. First, dividend payment is one of the main areas where conflict of interest may occur between shareholders and top management of organizations. Therefore, dividend policy serves as a tool to mitigate the agency cost between management and shareholders (Farinha, 2003; Hu & Kumar, 2004). Second, prior research is yet to bridge the gap between CEO power and dividend policy with a moderation effect from internal and external monitoring mechanisms in an imputation tax environment. Further, this research can help in understanding the impact of the classical tax environment as well as the imputation tax environment in addition to addressing agency conflict between shareholders and management. Third, while greater monitoring intensity is necessary to protect shareholders' rights, it is not enough to explain the standalone relationship between CEO power and dividend policy.

In this study, the Australian setting is used because of its unique tax imputation system. Therefore, Australian data enables us to study dividend policy in two different tax systems: the classical tax system and the imputation tax system. However, there is limited research on how dividend policy varies between the traditional and imputation tax environments. The results of the study give an insight into the type and power of dividend responses to significant changes in taxation rulings designed to impact cash disbursements to investors. According to the Australian imputation tax system, when Australian companies pay a dividend on profits received and taxed in Australia, these are known as franked dividends and these have a franking credit attached to them that represents the amount of tax the company has already paid. Thereafter, it is adjusted from the personal tax liability of the investor. On the other hand, any profit earned outside Australia and not taxed in Australia known as an unfranked dividend, which does not carry any tax credit. As such, investors who receive a dividend with no franking credit are taxed as usual under the traditional tax environment. Therefore, the novel Australian setting allows us to investigate the research question and present the results from two different tax environments, the classical and the imputation.

On order to pursue personal objectives, a powerful CEO may invest in non-value maximizing projects by sacrifices shareholders' best interests. As such, shareholders can actively monitor a CEO's activity so that such impounding can be prevented, but this monitoring can be costly if there is significant dispersion in

ownership (Shleifer & Vishny, 1986). Accordingly, Onali et al. (2016) suggest that a potential solution may be provided by the dividend payment. Paying a dividend serves as a monitoring device for shareholders because dividend payments reduce the free cash flow that a CEO can otherwise use in non-value maximizing projects (Jensen, 1986) and it also attracts outside investors, who scrutinize the CEO's activities more frequently (Easterbrook, 1984).

However, Jensen (1986) argues that dividend payment can help to alleviate agency conflict between the management of the firms and the shareholders. When shareholder's active monitoring is absent, dividend payment can provide an indirect control benefit, as explained by Rozeff (1982). However, a number of studies in the United States (US) reveal that entrenched CEOs increase dividend payment because it can keep minority shareholders away from active CEO monitoring (Elyasiani & Zhang, 2015; Hu & Kumar, 2004). In firms with weak governance, dividend payment serves as a tool to mitigate agency problems because the commitment to pay a regular dividend reduces the uncertainty among shareholders. Additionally, it also imposes a limit on a CEO's activity by reducing the apprehension that free cash flow can be wasted in non-value maximizing projects (Onali et al., 2016). La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) report in their seminal paper that the dividend payout ratio (DPR) is higher in countries where minority right is stronger, meaning that higher dividend payment is an outcome but not a substitution of strong minority right. Based on the literature, the relationship between CEO power and dividend policy with a moderation effect from internal and external monitoring mechanisms in an imputation tax environment is investigated.

Recent studies on CEO power have investigated its impact on corporate strategic decision, acquisition, market competition, risk, leverage choices and financial performance (see e.g. (Adams et al., 2005; Chikh & Filbien, 2011; Korkeamäki, Liljeblom, & Pasternack, 2017; Morse et al., 2011; Sheikh, 2019; Veprauskaitė & Adams, 2013). The findings of these studies are inconclusive. For example, Adams et al. (2005) investigate US firms and note that CEOs in the US enjoy considerable discretion and influence over the crucial financial decisions that lead to different financial performance. However, Veprauskaitė and Adams (2013) examine the relationship between CEO's decision-making power and financial performance of UK publicly listed companies and find CEO power is negatively related to financial

performance. Furthermore, Korkeamäki et al. (2017) explain CEOs' personal leverage choice is related to CEOs who have longer tenure and perform a dual role. The relationship is weaker if the CEOs' personal assets are connected with the firm. Additionally, CEO power is also related to a higher cost of debt and lower credit ratings (Bebchuk et al., 2011; Liu & Jiraporn, 2010). It appears from these studies that CEO power positively influences managerial entrenchment, deteriorates agency conflict and endangers the firm value. Researchers have demonstrated a significant interest in examining how powerful CEOs affect the strategic plan and corporate financing decisions of the organization (Korkeamäki et al., 2017; Sheikh, 2019). Formulating financial policy is one of the most important strategic areas for a firm and the CEO is the person who has the most influence over it (Huang et al., 2016; Pan et al., 2016). As such CEOs may positively affect the performance of the firm by taking effective corporate financing decisions and, thus, increase the firm's competitiveness in the marketplace (Herrmann & Datta, 2002).

This relationship between CEO power and dividend policy is empirically examined using a sample of 10,213 firm-year observations from 2001 to 2015 listed under the Australian Securities Exchange (ASX). Australian data enables us to investigate the dividend policy under two different tax systems: the classical tax system and the imputation tax system. Australia introduces the dividend imputation tax system in 1987 and subsequently provided an experimental setting for investigating managerial action and response to the traditional and imputation tax systems that significantly changed the value of the dividend to the existing and future shareholders. Additionally, Australia is known to have a robust economy, with a significant impact on the world economy in 2019 (Australian Trade Commission, 2019, January). The Australian Trade and Investment Commission's (Austrade) *Benchmark Report 2019* provides evidence that Australia is the only developed country that has never faced an annual recession between 1992 and 2018, with an average annual growth rate of 3.2% during that time. Moreover, in the latest assessment, the International Monetary Fund (IMF) predicts that Australia will experience an average growth rate of 2.7% per year from 2020 to 2024 in terms of real gross domestic product (GDP) (International Monetary Fund (2019), which gives Australia the highest GDP growth among the major developed economies. As a result, in addition to the unique imputation tax environment, the Australian economy's resilience is sustained by a robust policy

framework, strong institutions, a healthy fiscal position of the government and a modern financial system. Therefore, results from this investigation will provide empirical evidence from the point of view of economic resilience and the classical tax environment as well as the imputation tax environment.

The empirical result of this study shows that the likelihood of dividend payment is strongly associated with the previous year's dividend payment decision because the dividend payment decision is termed as "sticky" (Allen & Michaely, 2003; Brav, Graham, Harvey, & Michaely, 2005) as it does not significantly change over time if the other factors such as investment, profitability and growth remain similar. Additionally, the dividend payment decision model also reports that the relationship between CEO power and the dividend payment decision is positive and statistically significant, meaning powerful CEOs take a positive dividend payment decision to pass a positive signal to the shareholders in order to avoid the excessive monitoring from the capital market. Subsequently, the relationship between the CEO power index and DPR at year t and at one-year lag periods $t-1$ and $t+1$ is examined and the result indicates a negative and significant association. One possible explanation may be due to the agency conflict powerful CEOs may find when implementing investment strategies in favour of their own empire building by compromising shareholders' best interests. By lowering DPR, powerful CEOs may achieve that flexibility. Therefore, one of the major interests in organizations from the shareholders' perspective is dividend payment.

Powerful CEOs may take on non-value maximizing projects by sacrificing the shareholder's best interest, but with greater monitoring intensity, shareholders' rights can be protected. Therefore, it is not enough to explain the standalone relationship between CEO power and dividend policy. Internal and external monitoring variables are therefore brought in as moderating variables to investigate whether these variables can limit CEO power. The direction of the dividend payment decision is still positive and significant when CEO power interacts with 5% Blockholder, and the coefficient of DPR is significant but turns from negative to positive when CEO power interacts with 5% Blockholder. This indicates that with the presence of strong internal monitoring mechanisms, the dividend payment has been increased among the dividend payee firms, reducing agency cost as well as helping to protect shareholders' rights. Therefore, it limits the preference for powerful CEOs to diminish DPR and restricts

their ability to implement a personal empire-building strategy. On the other hand, the external monitoring variable institutional ownership does not have any impact on dividend policy when interacting with the CEO power index, consistent with prior literature (Balachandran, Khan, Mather, & Theobald, 2019; Grinstein & Michaely, 2005). Subsequently, to investigate the impact of Australia's unique imputation tax environment in addition to the classical tax system, partitioning testing is performed given the franked and unfranked dichotomy of the dividend. The result of the partitioning test indicates that when the dividend carries no franking credit, the relationship between the CEO power index and the dividend payment decision is not significant, but with the franking credit, the relationship is positive and significant. Irrespective of franked and unfranked features, the relationship between the CEO power index and DPR is negative and significant but the coefficient indicated that powerful CEOs from the dividend payee firms having an unfranked dividend feature reduce DPR by 8.45%, whereas the reduction is 4.53% for the dividend payee firms including the franking credit feature. Therefore, powerful CEOs cannot ignore the tax benefit shareholders may receive from franking credits.

Subsequently, to confirm the robustness of the result, alternative measures of CEO power are used to find a consistent result. In addition to the standard regression model, generalized least squares (GLS) random effect (RE) model sensitivity analysis is used[49] and the main test is rerun. These tests further confirm the validity of the result. The sample is also partitioned based on the implementation of the "two strikes" rule in Australia. According to this legislation, if 25% or more of the investors cast a dissenting vote for two consecutive years to approve the remuneration report at the annual shareholder meetings, then the board of directors need to resign, except for the CEO, and they may then face re-election. The implementation of this rule gives more power to the shareholders, allowing them to monitor and control the action of the boards. Subsequently, the years before and after the "two strikes" rule are partitioned. Though the direction of the result does not change, the coefficient of the result suggests that the "two strikes" rule impact negatively on CEO power. To confirm that the statistical significance, sign and magnitude of all the tests are not biased due to

[49] Details of the rationale to use the GLS RE model are explained in section 3.2.

endogeneity, two econometric techniques are used, specifically propensity score matching (PSM) and the two-step system, generalized method of moments (GMM). The result from these two econometric analyses confirms the findings from the main models.

The results of this study make several contributions to the dividend policy literature. First, by investigating the relationship between CEO power and dividend policy with a moderation effect from internal and external monitoring mechanisms in an imputation tax environment, the study contributes to the CEO-based dividend literature debate from the monitoring perspective by considering the classical and imputation tax environments. Second, the study also contribute to the debate on whether the CEO matters in the corporate decision-making process. Prior literature has a mixed opinion. In one extreme, the literature argues that the CEO does not matter (Finkelstein & Hambrick, 1996; Pfeffer, 1997). In the other extreme, several studies show evidence that CEOs do matter and influence strategy formulation and the decision-making process (Adams et al., 2005; Aktas et al., 2019; Baik et al., 2011; Bebchuk et al., 2011; Chintrakarn, Chatjuthamard, Tong, & Jiraporn, 2018; Hackbarth, 2009; Hambrick & Mason, 1984; Korkeamäki et al., 2017; Liu & Jiraporn, 2010). The study therefore contribute to this rich literature by showing that although powerful CEOs take positive dividend payment decisions to pass a signal for future growth and prosperity and to avoid monitoring from the capital market and they subsequently reduce dividend payments to achieve flexibility and implement personal agendas, internal monitoring mechanisms create an impediment to achieving that objective and therefore protect shareholders' rights. Third, the study also contributes to the agency theory-based CEO literature (Easterbrook, 1984; Hu & Kumar, 2004; Jensen, 1986; Korkeamäki et al., 2017; La Porta et al., 2000; Sharma, 2011) and provides evidence that the internal monitoring mechanism reduces the agency conflict between shareholders and management. Practically, the implications of the results provide important insights into the board of directors while hiring CEOs based on their existing dividend policy.

The remainder of the paper proceeds as follows. Section 2 describes the related literature and hypothesis development. Section 3 provides an insight into the sample collection and the construction of the variables. Section 4 reports the empirical results. Section 5 provides the results of several robustness checks, further evidence and an

explanation of the main findings. Section 6 provides details on the endogeneity test. Section 7 concludes the study.

4.2 Literature review

4.2.1 CEO power

The CEO role in an organization is considered a source of power, and the CEO is also considered to be an architect of the organization's policy formulation (Adams et al., 2005; Lewellyn & Muller-Kahle, 2012; Sheikh, 2019). The CEO is the person who takes key investment and financial decisions for the better performance of the organization. Therefore, how CEOs influence these decisions depends on how much power they hold in comparison to other top executives and board members. The ability of CEOs to influence the strategic and financial decisions of the organization is reflected in the power that CEOs enjoy.

Finkelstein (1992) categorizes four different sources of power: ownership power, prestige power, structural power and expert power. Similarly, Daily and Johnson (1997) identify different forms of CEO power, such as CEO duality, CEO ownership, CEO tenure and the independent/interdependent composition distinction. CEO choices are important in order to understand firms' behaviours. Finkelstein and Hambrick (1996) offer an extensive review on this topic. Therefore, CEO choice becomes an interesting debate on whether CEOs "matter" to corporate financial decisions. Hannan and Freeman (1977) emphasize organizational and environmental limitations that restrict managerial action and de-emphasize the impact of managerial discretion. However, Hambrick and Mason (1984) and Tushman and Romanelli (2008) argue that managerial leadership is the main factor that drives an organization's success. Recent studies show CEO dominance aggravates agency costs and has an adverse effect on firm performance.

Bebchuk et al. (2011) demonstrate that CEO dominance lowers firm performance when it is measured by Tobin's q and that it is also associated with poor accounting profit. Therefore, the evidence shown by Bebchuk et al. (2011) provides a solid understanding of how CEO dominance or power can influence the corporate outcomes, in particular strategy formulation and financial decision making. Furthermore, the influencing factor that induces CEO power to affect corporate

outcomes is presumably related to agency cost. Chintrakarn et al. (2018) explain that powerful CEOs may adopt decisions that favour their own empire building rather than the shareholders' best interests and thus deteriorate the agency conflict. In a similar vein, Adams et al. (2005) argue that top executives can influence corporate outcomes only when they have the power to influence vital decisions. On the basis of this argument, they hypothesize that firms with powerful CEOs who enjoy higher decision-making power, experience more variation in performance. They further argued that powerful CEOs are less interested in compromising with other executives and board members, which may result in extreme decisions, both favourable and detrimental, to the organization. Therefore, it may be said that CEOs can influence the corporate financial decision when the CEO is powerful.

Although no single theory can explain how power can affect the decision-making behaviour of CEOs, agency theory (Jensen & Meckling, 1976) explains that CEOs have the tendency to shift corporates resources so that they can implement their personal empire-building agenda and forgo shareholder's interest. Agency theory also argues that CEOs sometimes demonstrate a less diversified and risk-averse attitude and, therefore, they are willing to take less risk than desired by the shareholders (Eisenhardt, 1989; Holmström, 1999). As a CEO has the capacity to shift corporate resources as well as to take conservative investment decisions and this capacity increases with power, agency theory assumes that powerful CEOs only take actions that will reduce the risk and enhance the positive image of the organization. Therefore, Caliskan and Doukas (2015) investigate the link between CEO risk preferences and payout policy and found risk-averse CEOs choose dividend payment more than risk-taking CEOs. Particularly, CEOs may sacrifice investment opportunities and choose to pay a dividend when they assume the possibility of greater benefit in the future.

Dividend policy is a strategic decision taken by management and the board of directors between whether to distribute cash or accumulate cash for future investment. However, the CEO is the person who makes the ultimate decision for the organization. Therefore, the dividend decision depends largely on the CEO. Caliskan and Doukas (2015) initiate an argument as to what influences CEOs to pay a dividend. One argument may be that conservative CEOs preserve cash as a cushion so that they can use it in times of emergency. Due to the higher liquid assets, firms achieve financial strength and also reduce the possibility of bankruptcy. As such, this assessment is only

logical when there is no agency problem and the firm's investment portfolio is optimal. However, this is not realistic for many reasons. First, when firms preserve large amounts of cash, shareholders become concerned that the CEO may implement their personal agenda using the free cash flow (Jensen, 1986). Another reason is that if cash is accumulated, shareholders may feel that there is an opportunity cost because the cash is not invested in a project where high returns are possible. On the other hand, when the CEO makes the dividend payment decision, this is a positive signal to the shareholders. Subsequently, it helps to build confidence in the CEO as well as the company management.

Prior literature also argues that corporate dividend policy is used to mitigate agency problems between top management and shareholders (Boumosleh & Cline, 2015). Furthermore, Jiraporn, Kim, and Kim (2011) argue that higher dividend payments also relate to better corporate governance. To maximize the firm value, there should be a combination of corporate governance mechanisms and dividend policy. However, Hu and Kumar (2004) investigated CEO compensation and board structure and report that firms with entrenched managers pay a higher dividend. Furthermore, Hermalin and Weisbach (1998) argue that CEO power is one of the determinant factors of board effectiveness, and this effectiveness depends on how the board of directors delegates power to the CEO. Therefore, CEO power may create an impediment to board monitoring with an apprehension of losing power and thus, they are willing to formulate investment strategies individually.

4.2.2 Dividend policy

Dividend policy is one of the important areas of research in accounting and finance. Many researchers have investigated the reasons for paying substantial portions of the firm's earnings as dividends. As such, differences in dividend payments over time across organizations is still one of the major unsolved puzzles in finance in spite of the extensive literature. Two major theories were developed to describe the corporate dividend policy: the free cash flow hypothesis and the signalling to shareholders hypothesis. The signalling hypothesis (John & Williams, 1985; Miller & Rock, 1985) explains that managers declare a dividend to pass a signal to the shareholders regarding the firm's strong position in the market and future profitability. On the other hand, the free cash flow hypothesis (Easterbrook, 1984; Jensen, 1986)

describes how dividend policy helps to identify agency conflicts between managers and investors. Easterbrook (1984) documents that agency problems between top executives and shareholders can be mitigated by the monitoring function of dividend policy. On the other hand, Jensen (1986) states that CEOs' intention to build individual empires leads to agency conflicts when investing free cash flow in negative net present value (NPV) projects. Therefore, dividends mitigate this problem by reducing the level of free cash flow available to CEOs.

Top management wants to expand the organization beyond the optimal level to secure personal benefit (Jensen, 1986). To deal with this overinvestment, one prominent way is to disburse the excess cash, eventually mitigating the agency problems. Therefore, management discretion to disburse dividends may serve as one of the tools to diminish excess cash and subsequently reduce agency conflict. Easterbrook (1984) argues that dividend payments to shareholders also reduce the agency problem by increasing the frequency of external fundraising possibilities and enhancing monitoring by investment banks. Additionally, Balachandran et al. (2019) argue that dividend payments cancel out the possibility of the overconfident manager investing the funds in sub-optimal projects. Prior studies that explain the rationale behind the dividend decision argue that the dividend decision depends on the trade-off between dividend decision and earning retention, which changes over time as firms accumulate cash and experience a reduction in investment opportunities as well as when the firms mature (DeAngelo et al., 2006).

DeAngelo et al. (2006) propose a life cycle theory of dividend payment by combining Jensen (1986) agency theory in regards to the firms' investment opportunity. In this theory, DeAngelo et al. (2006) report that firms change their dividend decision based on firm age and investment opportunities. This theory also predicts that firms pay less dividends in the early years of their establishment because the internally generated funds are less than the demand for funds generated from the investment opportunities. However, with maturity, the internally generated funds exceed the investment opportunities. Therefore, firms increase their dividend payment to mitigate the possibility of wasting free cash flow. However, Myers (1984) points out that the pecking order model does not describe why firms pay a dividend, but at the time of the dividend payment, the pecking order model affects the decision payment.

Specifically, the relationship between asymmetric information (AI), agency conflicts and other markers is at odds with the time series and cross-sectional variations in dividend choices (Allen & Michaely, 2003; Brav et al., 2005) leaving the need for further research. Furthermore, existing literature has investigated the relationship between investment, acquisition, merger and performance but the influence of CEO power on dividend policy from a monitoring perspective is still unexplored. The existing literature on dividend policy has already made it clear that dividend payment decision is not the only determinant in the investment and financing decision of the firm. David (2010) states that if a CEO infers a higher investment need, he may seek to build his retained earnings by lowering the dividend payment. In contrast, CEOs may decide to enhance the dividend payment percentage if they perceive a comparatively higher cash flow from the present investment (Wu & Liu, 2011).

4.2.3 Dividend imputation

Australian legislators introduced the dividend imputation system on 1 July 1987 to circumvent the concern of double taxation on dividend payments. Under the Australian dividend imputation system, the dividend paid by Australian resident firms to Australian resident shareholders may be what is known as a franked dividend, which has an imputed tax credit attached to them to reduce the personal income tax liability of the shareholder. Therefore, when a company distributes its dividend after paying the corporate tax to its shareholders, it has the option under the dividend imputation system to pass it by way of a tax credit, which is called franking distribution. A recipient of a franking credit is taxed for the full amount of profit shown on the distribution, but they can reduce their actual tax payment by the credit they receive for their dividend on which the companies have already paid corporate tax. This dividend imputation system is designed to reduce the personal tax liability to avoid double taxation. On the other hand, an unfranked dividend is a dividend from the earnings on which no tax payment has been made in Australia and it does not carry a tax credit. The franking dividend may be fully franked or may be a mixture of franked and unfranked.

4.2.4 Internal and external monitoring mechanisms

Prior research (see e.g. (Florackis & Ozkan, 2009; Khan, 2006) explains that to monitor top management's role in an organization, shareholders perform an important role. Hence, the most common argument in modern organizations is that the owner and management of firms have different objectives and risk preferences. As such, top management wants to maximize their wealth instead of the shareholders under the agency theory framework (Eisenhardt, 1989; Le, Walters, & Kroll, 2006). Therefore, to mitigate agency problems by limiting top management's power, shareholders need to rely on internal and external monitoring mechanisms. Additionally, these monitoring mechanisms also ensure that management is carrying out organization policy and adopting a strategic decision to maximize shareholders' wealth. So, to restrict a CEO's behaviour and discretion, shareholders can play an important monitoring role in strengthening the corporate governance structure of the company (Florackis & Ozkan, 2009; Veprauskaitė & Adams, 2013). Jensen (1986) explains that in the presence of increased monitoring, firms are interested in paying out their free cash flow. However, Grinstein and Michaely (2005) argue that under the agency theory framework, top executives are interested in sharing more profit with the investors, if the monitoring cost is low.

Prior research identifies blockholders and the board of directors as important internal control mechanisms (Huson, Parrino, & Starks, 2001) and institutional ownership as an important external control mechanism (Grinstein & Michaely, 2005; Guan, Li, & Ma, 2018; Le et al., 2006). However, Fenn and Liang (2001) argue that organizations with higher inside ownership can reduce agency costs and thus increase dividend payment. Similarly, Balachandran et al. (2019) investigate insider ownership and dividend policy in an imputation tax environment and reports that insider ownership is positively associated with the dividend payment decision and DPR.

Amin, Dutta, Saadi, and Vora (2015) summarize three arguments from prior dividend literature on the dividend payment decision and the relationship with institutional ownership. First, the "dividend relevance argument" explains that firms want to give a signal to the marketplace about their strong financial footing through their dividend policy. Second, the "informational advantage and informed-trading argument" explains that institutional investors have better access to better quality of

information; therefore, they can trade before the announcement date, which can reduce the information content of the announcement. Finally, the "dividend preference argument" explains institutional ownership is indifferent to dividend surprises, and dividend payment does not affect the institutional client. However, institutional ownership is better informed than the individual investor and has more encouragement to engage in monitoring activities (Balachandran et al., 2019). On the other hand, Grinstein and Michaely (2005) investigate institutional holdings and dividend payment policy and find a little evidence that institutional ownership plays a significant role in increasing dividend payments in the US.

4.2.5 Hypotheses development

Practically, top management needs to take dividend decisions in two steps (Kumar & Lee, 2001). First, management needs to choose whether they pay a dividend or not. Second, management also needs to decide the payout from the dividend payee firms. Allen and Michaely (2003) argue that due to the signalling hypothesis, the market reacts positively if there is an announcement of an increase in dividend and vice versa. Therefore, the dividend payment decision can provide a positive signal about the future growth of the company. Fluck and Fluck (1999) examine the relationship between dividend payment and board independence. The results indicate a positive relationship because board independence ensures good corporate governance. As a result, it improves the internal monitoring mechanism. Additionally, the free cash flow hypothesis (Jensen, 1986) also states that strong internal monitoring can result in increased payouts because due to the pressure of internal monitoring, CEOs may not get the opportunity to use the free cash flow for their own empire-building projects. Aidong and Kumar (2004) found both the likelihood of dividend payment and the level of dividend payment has a positive relationship with the level of entrenchment of managers.

In this study, agency theory is used to explain the various dividend policies taken by CEOs. Bebchuk et al. (2011) argue that a dominant CEO worsens the agency cost, which contributes to poor performance by firms. Therefore, dividend payment is used to alleviate this agency problem. Although powerful CEOs may want to send a positive signal to the marketplace regarding the future growth of the company, they may also choose to decrease the dividend payment for two reasons. First, regular dividends may decrease the free cash flow and reduce the scope of the CEOs to utilize

this free cash flow to implement projects where they have a personal interest (Easterbrook, 1984). Second, an increase in dividend payment also places CEO under increased and rigorous monitoring from the external capital market's monitoring mechanisms and it also increases the possibility of scouting equity frequency (Easterbrook, 1984). This capital market monitoring therefore keeps CEOs away from pursuing their projects for their personal benefit. Therefore, CEOs may prefer to make a lower dividend payment. Accordingly, powerful CEOs tend to influence the organization's dividend policy to a greater extent than less powerful CEOs. Consequently, a powerful CEO may lower the dividend payment among the dividend payee firms.

On the other hand, firms always want to exhibit a consistent nature in terms of dividend payment. Dividend payment largely depends on the existing dividend decision and the DPR. As such, dividend policy is termed as "sticky" (Allen & Michaely, 2003; Brav et al., 2005). Therefore, a significant change in earnings can lead to a change in dividend payment. Chintrakarn et al. (2018) argue that firms usually continue their existing dividend policy and are reluctant to change or lower it. Therefore, CEOs may have very little room to use their discretion over the firms' dividend payment policy and simply carry out the established dividend payment policy. Thus, it is hypothesized that powerful CEOs may affect the dividend decision and the dividend payment of the dividend payee firms:

H1(a): Powerful CEOs have a higher possibility of making a positive dividend payment decision.

H1(b): Powerful CEOs have a higher possibility of reducing the DPR of the dividend payee firms.

Since institutions are knowledgeable and keep more information about the market than individual shareholders, they can better perform the monitoring activities, and thus Balachandran et al. (2019) anticipate a positive relationship between dividend and institutional ownership. However, Grinstein and Michaely (2005) report that institutional investors are not associated with an increase in dividend payment in US firms. On the other hand, if the employee or member of the board of directors holds a block of stock, for example, at least 5% of the outstanding shares, they can also frequently and rigorously monitor the CEO's activities. Similarly, Fenn and Liang

(2001) find that insider ownership alleviates the agency problem and thereby reduces agency costs and increases the dividend payment. It is therefore hypothesized that influence over CEO may be achieved through insider ownership in order to mitigate agency cost and subsequently increase the dividend payment:

H2(a): When interacting with internal monitoring variables, powerful CEOs have a higher possibility of making a positive dividend payment decision.

H2(b): When interacting with internal monitoring variables, powerful CEOs have a higher possibility of increasing the DPR of the dividend payee firms.

Prior literature suggests that institutional ownership is considered a main external control mechanism (Grinstein & Michaely, 2005; Guan, Li, & Ma, 2018; Le et al., 2006). Since institutional owners are more organized and have comparatively easy access to capital market resources, they are assumed to have more knowledge and be better informed than an individual investor (Balachandran et al., 2019). Therefore, it is also anticipated that they may have the capacity to monitor firms' actions and subsequently influence corporate dividend policy. On the other hand, Grinstein and Michaely (2005) find little evidence that institutional ownership plays a significant role in increasing dividend payment in the US. If the quality of engagement increases between firms and institutional investors, it also enhances the effectiveness and efficiency of the corporate governance mechanism. Amin et al. (2015) argue that effective monitoring by institutional owners depends on their investment horizon. For example, a pension fund has a long-term investment objective whereas a mutual fund has a short-term investment objective. Attig, Cleary, El Ghoul, and Guedhami (2012) provide evidence that institutional investors with short-term investment objectives are not interested in initiating effective monitoring activities because they hold the shares for a short time and therefore have reduced bargaining power. Therefore, Amin et al. (2015) investigate institutional investors and dividend surprises but find no significant relationship indicating that institutional investors do not prefer dividend surprises, which also verifies the "dividend preference argument". This leads to the following two hypotheses:

H3(a): When interacting with external monitoring variables, powerful CEOs may have or may not have an impact on the dividend payment decision.

H3(b): When interacting with external monitoring variables, powerful CEOs may have or may not have impact on the DPR of the dividend payee firms.

Pattenden and Twite (2008) argue that due to the tax preference associated with franked dividends after the introduction of the imputation tax system, firms increased their dividend payment. Additionally, investors are interested in receiving a franked dividend because this way they can get access to the tax credit. Additionally, Brav et al. (2005) also document that tax consideration plays a major role in the dividend payment determination. Therefore, Australian managers may have a greater motivation to increase the dividend payment associated with franking credit in comparison to the classical tax system where the dividend is under double taxation. This leads to the following two hypotheses:

H4(a): Powerful CEOs from firms with franking credits available will have a higher possibility of dividend payment.

H4(b): Powerful CEOs from firms with franking credits available will have a lower possibility of reducing the DPR of the dividend payee firms.

4.3 Sample collection and construction of variables

4.3.1 Data sources

Aspect Huntley's financial database (specifically, FinAnalysis and DatAnalysis) was used to collect data relating to the dependent variables and all other financial data relating to the control variables, and the Securities Industry Research Centre of Asia-Pacific (SIRCA) databases were used to collect data relating to CEO power indices and corporate governance variables such as board and CEO characteristics. The Connect4 Annual Reports Collection was used for data not available from the above databases. The coverage of governance data in SIRCA starts in 2001 with the latest data available for 2015, consequently the sample period is 2001–2015 for all firms listed on the ASX. Following prior literature, this study excludes financial intuitions, banks and insurance companies due to their unique regulatory framework (La Porta et al., 2002; Matsumoto, 2002). After excluding duplicate observations (391), observations relating to financial and real estate industries (1840) and firms with missing values (1918), this study examines 10,213 firm-year observations and sample breakdown on the basis of year and industry is presented in Table 1. Further to dividend payment decisions, impact of CEO power on

dividend payment levels was also investigated. Therefore, firms that did not pay a dividend were excluded. The final sample comprises 3,947 firm-year observations to investigate the secondary research question. Being consistent with prior studies, winsorizing at the 1% and 99% levels was performed for all continuous variables (Rajgopal et al., 2006) to remove the effect of outliers. Details of each variable used in the study are presented in Appendix A.

Table 1: Sample breakdown- year and industry wise

Year \ Industry	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrial	Information Technology	Material	Utilities	Total
2001	31	109	45	75	25	52	45	38	7	**427**
2002	33	108	44	78	23	48	37	105	5	**481**
2003	34	110	39	32	23	54	38	128	5	**463**
2004	37	116	43	68	62	80	70	193	10	**679**
2005	37	115	39	85	63	113	66	202	8	**728**
2006	38	110	37	93	69	120	66	226	6	**765**
2007	37	98	33	102	67	124	63	237	8	**769**
2008	36	96	32	104	70	130	67	256	10	**801**
2009	35	95	31	102	67	133	67	264	10	**804**
2010	36	92	29	104	66	133	63	220	11	**754**
2011	33	86	30	99	59	123	62	249	9	**750**
2012	34	87	27	95	58	117	57	248	11	**734**
2013	34	79	29	93	48	112	51	232	11	**689**
2014	39	87	27	87	56	104	55	225	10	**690**
2015	35	91	29	81	57	103	58	213	12	**679**
Total	**529**	**1479**	**514**	**1298**	**813**	**1546**	**865**	**3036**	**133**	**10213**

4.3.2 Model

In this study, the logistic model and pooled ordinary least squares (OLS) regression with cluster-robust standard errors was used to examine the relationship between dividend payment and CEO power. Cluster-robust standard errors were used because these consider the heteroscedasticity in a model's unexplained variation. Therefore, if the magnitude of variation in the outcome variable is correlated with the independent variables, robust standard errors take this correlation into account (Greene, 2018). Furthermore, cluster-robust standard errors consider the heteroscedasticity across a cluster of observations. The OLS regression models used in this study are expressed as follows[50]:

$$Dividend\ Pay_{i.t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + [Control\ Variables] + IND\_E + YEAR\_E + \varepsilon_{i,t} \quad (1)$$

$$DPR_{i.t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + [Control\ Variables] + IND\_E + YEAR\_E + \varepsilon_{i,t} \quad (2)$$

[50] VIF test has been conducted for all main and additional analyses to test potential collinearity and found no collinearity.

A standard regression model such as OLS may be biased due to the possibility of omitted variables. This bias is more common in social science studies as the researcher may not include all variables in the empirical model (Firebaugh, Warner, & Massoglia, 2013). For example, in this study, all possible variables that affect dividend policy may not have been included. The extent of the bias mainly depends on the effect of omitted variable causation and the magnitude of the correlation between the measured and unmeasured causes. Random assignment is one of the popular statistical techniques to alleviate omitted variable bias. In the randomization technique, biasing effects of confounding variables can be reduced without actually measuring those variables or even without knowing them (Firebaugh et al., 2013). To confirm the robustness of the results of this study, the GLS RE model was used in addition to standard regression. The RE model is preferred over the fixed effect (FE) model because it is robust to first-order autoregressive (AR(1)) disturbances (if any) within unbalanced panels and cross-sectional correlation and/or heteroscedasticity across panels (Pathan, 2009). In addition to this, the FE model explains within-unit variance while the GLS RE model focuses on between-unit as well as within-unit variance (Firebaugh et al., 2013). Additionally, the GLS RE model can estimate the effect of measured causes that do not vary over time, which allows this method to deliver more powerful tests of hypotheses by generating narrower confidence intervals. In this study, on the right-hand side, some important variables that are time-invariant were used such as CEO Founder, CEO Functional Experience, CEO Gender along with other variables such as CEO duality and some board structure variables that do not significantly vary over time, therefore the FE estimates will be inexact (Wooldridge, 2010). Finally, this study has a large "N" (1,184) and a small "T" (15). Baltagi (2005) suggests that with certain types of panel dataset (such as observations on 1,184 firms over 15 years), FE estimation is not always consistent because a large "N" may lead to an enormous loss of degrees of freedom. RE estimations used in this study are therefore expressed as follows:

$$Dividend\ Pay_{i.t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + [Control\ Variables] + \mu_t + IND\_E + YEAR\_E + \varepsilon_{i,t} \quad (1)$$

$$DPR_{i.t} = \beta_0 + \beta_1\ P\_INDEX\_1_{i,t} + [Control\ Variables] + \mu_t + IND\_E + YEAR\_E + \varepsilon_{i,t} \quad (2)$$

For our dependent variable, two different measures of dividend payment are used. One measure is related to the dividend payment decision and the other one is

related to the dividend payment level (see section 3.3.1), and to calculate CEO power, our explanatory variable in this study, principal component analysis (PCA) is used to construct the CEO power index, notated as *P_INDEX_1*, and one alternative measure of the CEO power index, notated as *P_INDEX_2* (see section 3.3.2).

4.3.3 Variables

4.3.3.1 Dividend

In this study, to investigate the relationship between powerful CEOs and the dividend payment decision, the dummy variable Dividend Pay is used, coded "1" if a firm pays a dividend in the current year and "0" otherwise (Balachandran et al., 2019; Florackis & Sainani, 2018). DPR is used to investigate the relationship between dividend payment level and powerful CEOs, reflecting the total dividends paid during the year divided by accounting earnings, where accounting earnings equal net profit after tax (Caliskan & Doukas, 2015; Guan et al., 2018).

4.3.3.2 Construction of the CEO power indices

CEOs are considered as powerful if they can formulate either financial or strategic decisions, despite potential opposition from top peer executives or members of the board of directors. In accounting, finance and management literature, there is no agreed-upon definition of CEO power. Researches use different proxies to measure power either singly or by constructing a power index by combining multiple proxies. Recognizing power as a multidimensional concept, Finkelstein (1992) defines four dimensions the of power relevant to CEOs as structural, ownership, expert and prestige. No single study captures all four sources of power, but researchers use different power proxies such as CEO Duality, CEO Tenure, CEO Ownership, CEO Founder, CEO Multiple Ownership and CEO Compensation to measure CEO power (Adams et al., 2005; Bebchuk et al., 2011; Daily & Johnson, 1997; Han et al., 2016; Huang et al., 2017).

Recently, some studies (Chao et al., 2017; Han et al., 2016; Huang et al., 2017; Jiraporn et al., 2012; Liu & Jiraporn, 2010; Morse et al., 2011; Veprauskaitė & Adams, 2013) start capturing the multidimensional concept of power through the construction of power indices using different combinations of the power proxies identified by Finkelstein (1992). Consequently, following Liu and Jiraporn (2010), Morse et al.

(2011), Veprauskaitė and Adams (2013), and Chao et al. (2017), two different CEO power indices were constructed (*P_INDEX_1* and *P_INDEX_2*) by using seven CEO power proxies related to structural power, ownership power and expert power. *P_INDEX_1* is used in this study as the main measure of the CEO power index and *P_INDEX_2* is used as the alternative measure of the CEO power index. To construct *P_INDEX_1*, power proxies such as CEO Duality, CEO Tenure, CEO Ownership, CEO Founder and CEO Functional Experience were used, all of which have an influential impact on CEOs' decision-making autonomy. Therefore, our dependent variable Dividend Pay is relevant to *P_INDEX_1*. Following the structural power dimension of Finkelstein (1992) and Daily and Johnson (1997), the alternative measure of CEO power index *P_INDEX_2* is constructed.[51] To construct these power indices, PCA is adopted as it considers the total variance in the dataset and helps to reduce the number of variables, meaning most of the variance in the correlation matrix is captured. Additionally, PCA can resolve the potential multicollinearity problem that may arise when several CEO power proxies appear in the regression model concurrently. Details of each of these CEO power proxies are detailed in the following sections.

CEO Duality: Prior studies use the CEO position as a concentration of CEO power (Adams et al., 2005; Morse et al., 2011). CEO positions such as the chair or president of the company enhance CEOs' decision-making powers and autonomy and loosen the organization's board monitoring mechanism (Hayward & Hambrick, 1997). It is expected that CEOs occupying dual roles in the organizational hierarchy have higher structural power, which would increase their capacity to influence the board's decision-making process. This dual occupancy by CEOs in the organizational hierarchy is commonly known as CEO duality. Chang and Sun (2009) argue that CEO duality can empower CEOs in taking the final decision, overruling any opposing views of the board. Therefore, the dual role can expedite the corporate decision-making

[51] Structural power is based on the formal organizational structure and hierarchical position occupied by the top manager (Finkelstein, 1992). If the manager possess higher structural power, they can influence corporate decision making because they have less dependency on other members of the organization. In any organization, the CEO is the person who makes the ultimate decisions for the organization. Subordinates obey the CEO not only because they are dependent on the latter but also because they believe the CEO has the right to exercise their legitimate power by the virtue of holding the key position of the organization.

process and can also help to achieve organizational performance by timely clutching the opportunity. However, CEO duality can also weaken the internal monitoring mechanism by establishing a CEO's autocratic attitude over the board in the day-to-day corporate decision-making process (Dayton, 1984). CEO Duality equals 1 if the CEO is also the chair of the board and 0 otherwise.

CEO Tenure: CEO tenure increases their firm-specific knowledge, which increases their influence over the other members of the organization. Subsequently, this knowledge helps CEOs to take better financial decisions because their experience increases with tenure, which eventually acts as a key factor in building their decision-making autonomy (Brookman & Thistle, 2009). Chava et al. (2010) argue that long tenure of CEOs helps to build influential relationships with other key members of the organization. As such, it can weaken the monitoring ability of board members over the CEO. Additionally, Hermalin and Weisbach (1998) also explain that longer CEO tenure escalates CEO power, which subsequently influences the board structure of a firm by making recommendations on the selection of board members. Therefore, longer CEO tenure enables them to take independent decisions with less reliance on the other board members. In this study, CEO Tenure indicates the total number of years for which a person has served as the CEO in a firm (Lewellyn & Muller-Kahle, 2012).

CEO Ownership: Ownership status of CEOs inspires them to take decisions that could maximize the firm's performance. CEOs can therefore ensure their own economic benefit due to their equity ownership in the company (Onali et al., 2016). Denis et al. (1997) argue that CEOs' ownership status also provides them with voting power, which also increases their decision-making autonomy. Additionally, the CEOs ownership status also reduces the likelihood of being dismissed as well as protecting them from excessive monitoring by board members (Lewellyn & Muller-Kahle, 2012). Pathan (2009) finds that CEOs enjoy greater power with increasing equity ownership. Therefore, CEO ownership plays an influential role in terms of enhancing CEOs' decision-making autonomy. Considering this fact, CEO Ownership is included in the constructed CEO power index. In this study, CEO Ownership is measured by dividing the total number of shares owned by the CEO by the firm's total number of outstanding shares.

CEO Founder: A founder CEO is assumed to enjoy greater power and possess an influential relationship over the board of directors when they play an important role at the time of the firm's establishment and successfully incorporate the firm as a publicly listed company, as well as their substantial ownership (Adams et al., 2005; Gao & Jain, 2012). Therefore, founder CEOs are found to be influential in the financial decision-making process (Chao et al., 2017). Lilienfeld-Toal and Ruenzi (2014) also report that founder CEOs are influential and hold greater discretionary power within the organization. Consistent with the prior literature (Daily & Johnson, 1997; Finkelstein, 1992; Lilienfeld-Toal & Ruenzi, 2014), CEO founder status is included because founder CEOs enjoy greater power due to their regular interactions and long-term relationships with the board of directors. As such, they can directly influence the firm's decision-making process. In this study, the dummy variable CEO Founder is equal to 1 if the CEO is the founder and 0 otherwise. Following Lilienfeld-Toal and Ruenzi (2014), the CEO is considered a founder if they were in the role of CEO at the time of incorporation or joined within one year of the firm's date of incorporation.

CEO Functional Experience: Functional experience is considered an important component of the types of knowledge and cognitive biases that CEOs bring to an organization. A CEO's ability to work in different functions helps them to enhance their cognitive abilities (Barker III & Mueller, 2002). Therefore, CEOs' practical knowledge of different functions within the organization can foster their decision-making accuracy and create a sense of power within themselves. As such, CEOs with a wide career experience including exposure to different functional areas can improve their efficiency in governing organizations (Finkelstein & Hambrick, 1996). Daily and Johnson (1997) argue that experienced CEOs develop wider networks and relationships with different types of people inside and outside the organization due to their exposure in different functional areas. Furthermore, CEOs can use their own network established through their functional experience to solve organizational problems without asking for help from the board of directors with the same functional experience (Daily & Johnson, 1997). Due to the CEO's own functional experience, their reliance on the board of directors decreases, eventually making them more powerful. In this study, CEO Functional Experience is equal to 1 if the CEO has any prior experience in any industry or function of an organization before acting as the CEO and 0 otherwise.

Compensation Ratio (CompRatio): Compensation plays an important role in motivating employees. Finkelstein (1992) argues that top management's compensation is regarded as an important measure of power because it derives from their structural position. Prior studies find a direct relationship between CEO power and compensation and these studies report that powerful CEOs receive higher compensation (Adams et al., 2005; Morse et al., 2011). As such, when a CEO receives a higher compensation than the executives of the organization, it provides him with a sense of power and authority that suggests higher influential capabilities in terms of financial decision-making autonomy within the firm. Bebchuk et al. (2011) argue that the compensation ratio demonstrates the CEO's relative position in the firm based on compensation. Therefore, CompRatio is a relevant proxy to CEO power, as it provides a picture of the CEO's relative importance within the top management. Following Daily and Johnson (1997) and slightly modifying Bebchuk et al. (2011), CompRatio was measured as the ratio of the CEO's total compensation to the total compensation of the top executive of the firm who receives the highest compensation after the CEO.[52] A higher compensation ratio indicates that the CEO holds relatively more power than other top executives in the firm.

Co-Opted Director: Co-opt directors are those directors who are appointed by the current CEO. Daily and Johnson (1997) argue that these directors are relatively loyal to the CEO. Consequently, they usually do not oppose a proposal submitted by the CEO to the board members for approval. Because of the potential loyalty and personal relationship between the board member and CEO, co-opt directors are considered as a useful proxy to construct the CEO power index. In this study, Co-Opt Director is measured as the number of directors who are appointed by the current CEO (Daily & Johnson, 1997). A higher ratio of co-opt directors on the board equates to the CEO having greater power.

[52] Bebchuk et al. (2011) measure CEO compensation as the ratio of CEO compensation to the total compensation of the top five executives of the organization. In this study, only the top executive after the CEO was used to measure the compensation ratio.

Panel A of Table 2 presents the results from the PCA for *P_INDEX_1*. The eigenvalue for the index is 1.61, which is greater than 1.[53] The corresponding percentage of variation is 32.27%, meaning that the principal component captures 32.27% of the total variance in the dataset. The results also indicate that all five CEO power proxies contribute positively to *P_INDEX_1*. Following Hermalin and Weisbach (1998), Veprauskaitė and Adams (2013),\ and Chao et al. (2017), it is maintained that CEO Duality, CEO Tenure, CEO Founder, CEO Ownership and CEO Functional Experience point towards a higher degree of decision-making power of the CEO. Consequently, a positive *P_INDEX_1* indicates higher CEO decision-making power and a negative *P_INDEX_1* indicates lower CEO decision-making power. Panel B of Table 2 reports the correlation matrix of the CEO power proxies used to construct *P_INDEX_1*. The results indicate a positive and highly significant ($p < 0.001$) correlation among all the variables. In addition to this, the Bartlett test of sphericity (Bartlett, 1954) and the Kaiser–Meyer–Olkin test of appropriateness were performed to validate the data reduction (Kaiser, 1974).

Panel C of Table 2 details the Bartlett test results; as the variables are not intercorrelated, this suggests that *P_INDEX_1* is acceptable. Multicollinearity is another consideration for excessively intercorrelated variables. Consequently, Kaiser–Meyer–Olkin statistics were performed, whereby the overall value for the test was found to be 0.64, which is higher than the unacceptable range (Kaiser, 1974), justifying the use of PCA.[54]

Panel A of Table 3 reports the results from the PCA of *P_INDEX_2* and shows that this test captures 36.97% of the total variance in the dataset with an eigenvalue of 1.11, which is greater than 1.

[53] If the eigenvalue is greater than 1, it indicates that the newly constructed variable has more explanatory power over the variance than any of the original variables individually (Florackis & Sainani, 2018).
[54] The result is considered unacceptable if the Kaiser–Meyer–Olkin test value is below 0.5.

The CEO performing a dual role in the organization, earning a larger compensation and more co-opt directors in the organization indicates that the CEO is enjoying greater decision-making power (Daily & Johnson, 1997; Finkelstein, 1992; Veprauskaitė & Adams, 2013). All three structural sources of power contribute positivity to the alternative measure of CEO power index *P_INDEX_2*. Therefore, a positive *P_INDEX_2* indicates higher decision-making power of the CEO and vice versa. Panel B of Table 3 shows the correlation matrix of CEO Duality, CompRatio and Co-Opt Director. The results also confirm the existence of positive and highly significant ($p < 0.001$) correlations among all the variables. The Bartlett test of sphericity (Bartlett, 1954) and the Kaiser–Meyer–Olkin test of appropriateness (Kaiser, 1974) were also performed to ascertain the intercorrelation of the variables.

Table 2: Construction of the CEO power index P_INDEX_1
Panel A: PCA

Principal component	Components	Component loadings
P_INDEX_1	CEO Duality	0.48
	CEO Tenure	0.53
	CEO Founder	0.54
	CEO Ownership	0.71
	CEO Functional Experience	0.55
Eigenvalue	1.61	
Proportion explained	32.27%	

Panel B: Correlation among CEO power proxies

	(1)	(2)	(3)	(4)	(5)
(1) CEO Duality	1.00				
(2) CEO Tenure	0.10***	1.00			
(3) CEO Founder	0.05***	0.13***	1.00		
(4) CEO Ownership	0.21***	0.18***	0.24***	1.00	
(5) CEO Functional Experience	0.11***	0.15***	0.12***	0.20***	1.00

Note: $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Panel C: Appropriateness of P_INDEX_1

Bartlett test of sphericity	H_0: CEO power proxies are not intercorrelated
KMO	0.64

Panel A in Table 2 presents the results from a PCA based on the following CEO power proxies, which are mostly related to CEOs' decision-making autonomy: CEO Duality, CEO Tenure, CEO Ownership, CEO Founder and CEO Functional Experience. Panel A in Table 2 represents the component loading, eigenvalue and proportion of variance, which are explained by the first components. Panel B in Table 1 presents the coefficient of correlation among the five CEO power proxies related to their decision-making autonomy. Panel C in Table 2 demonstrates the result of the Bartlett test and the Kaiser–Meyer–Olkin test of appropriateness. Details of each variable used in the study are presented in Appendix A.

Table 3
Construction of the CEO power index P_INDEX_2

Panel A: PCA			
Principal component	Components		Component loadings
P_INDEX_2	CEO Duality		0.63
	CompRatio		0.47
	% Co-Opt Director		0.70
Eigenvalue	1.11		
Proportion explained	36.97%		
Panel B: Correlation among CEO compensation proxies			
	(1)	(2)	(3)
(1) CEO Duality	1.00		
(2) CompRatio	-0.03***	1.00	
(3) % Co-Opt Director	0.04***	0.06***	1.00
Note: p < 0.05, ** p < 0.01, *** p < 0.001			
Panel C: Appropriateness of P_INDEX_2			
Bartlett test of sphericity	H_0: CEOs' structural power proxies are not intercorrelated		
KMO	0.51		

Panel A in Table 3 presents the results from a PCA based on the following CEO power proxies, which are mostly related to CEOs' structural power: CEO Duality, CompRatio and % Co-Opt Director. Panel A in Table 3 represents the component loading, eigenvalue and proportion of variance, which are explained by the first components. Panel B in Table 3 presents the coefficient of correlation among the three different measures of CEOs' structural power. These three measures are all related to CEOs' power and influence their ability to exercise decision-making power. Panel C in Table 3 shows the result of the Bartlett test and the Kaiser–Meyer–Olkin test of appropriateness. Details of each variable used in the study are presented in Appendix A.

The Bartlett test results displayed in panel C of Table 3 also justify the appropriateness of *P_INDEX_2*. As multicollinearity is another consideration for excessively intercorrelated variables, Kaiser–Meyer–Olkin statistics were performed, with an overall value for the test of 0.51, which is higher than the unacceptable range (Kaiser, 1974).

4.3.3.3 Internal and external monitoring variables

The most common argument in modern organizations is that the owner and the management of firms have different objectives and risk preferences. Therefore, under the agency theory framework, top executives are interested in maximizing their wealth instead of that of the shareholders (Eisenhardt, 1989; Le et al., 2006). As a result, shareholders depend on different monitoring mechanisms, internal and external, to overcome the agency problem and to ensure that management carries out its organizational policy and takes a strategic decision to enhance stockholder value. Prior research identifies blockholders and the board of directors as an important internal control mechanism (Mark R. Huson, Robert Parrino, & Laura T. Starks, 2001) and institutional ownership as an important external control mechanism (Grinstein & Michaely, 2005; Guan et al., 2018; Le et al., 2006). Therefore, in order to restrict

CEO's behaviour and discretion, shareholders can play an important monitoring role and strengthen the corporate governance structure of the company (Florackis & Ozkan, 2009; Veprauskaitė & Adams, 2013). Internal and external monitoring mechanisms therefore need to be incorporated as a moderating variable to capture its effect on the relationship between CEO power and dividend policy. Jensen (1986) explains that in the presence of increased monitoring, firms are interested in paying out their free cash flow. However, Grinstein and Michaely (2005) argue that under the agency theory framework, top executives are interested in sharing more profit with the investors if the monitoring cost is low. The proxy variable for internal monitoring mechanism is the dichotomous variable Blockholder, coded as "1" if the fraction of shares held by officers and directors of the organization is 5% or higher and "0" otherwise (Liu, 2014). Institutional Ownership is included as the proxy variable for external monitoring mechanism. Following Guan et al. (2018), institutional ownership is defined as the ratio of shares that institutions own in the firm divided by the total number of shares outstanding.[55]

4.3.3.4 Control variables

Control variables associated with CEO power and cash holdings are included to rule out alternative explanations for the influence of CEO power on corporate cash holding decisions. For greater representation, several control variables are incorporated into our analyses as follows.

4.3.3.4.1 Corporate governance variables

As well as the explanatory variables, a number of corporate governance variables were included that may have a significant effect on corporate dividend policy. Prior studies report that CEO gender and CEO age may influence corporate financing decisions. Ideally the CEO should choose an investment policy that could maximize the firm value under perfect capital market conditions. In this scenario, CEOs' preferences and characteristics do not play a role in investment decision

[55] Following Chhaochharia and Grinstein (2009), Institutional Ownership is further divided into low concentration of institutional ownership (a dummy variable that equals '1' if the concentration level is in the 25th quartile of the sample or lower and '0' otherwise) and high concentration of institutional ownership (a dummy variable that equals '1' if the concentration level is in the 75th quartile of the sample or above and '0' otherwise).

choices. However, existing finance theories explain that due to AI and the agency framework, top executives' preferences and characteristics do play a significant role in investment decision choices. Therefore, to control the CEOs' risk-taking behaviour, the variables CEO Gender and CEO Age are included. CEO Gender is a dummy variable equal to 1 if the CEO is female and 0 if the CEO is male. In this study, CEO Age is measured by the age of the CEO in years. The variables Board Size and Board Independence are used to control the monitoring mechanism of the organization. A large board and increased number of independent directors can magnify the monitoring capacity, which can reduce the decision-making autonomy of the CEO (Guest, 2008; Veprauskaitė & Adams, 2013). Board Size is measured as the total number of members on the board of directors and Board Independence is measured as the ratio of independent directors to the total number of directors of the firm (Florackis & Sainani, 2018). Rutherford et al. (2007) indicate in their study that frequent board meetings help board members gather more internal information about the firm, especially financial information, which can mitigate CEOs' action by reducing CEO power. Veprauskaitė and Adams (2013) also use board meetings (the total number of board meetings held during the year) as a control variable by viewing this as an important proxy to understand the information flow and processing at the board level.

4.3.3.4.2 Firm characteristics

In this study, the most commonly used firm characteristics in the prior literature are controlled. Large and profitable firms as well as firms with fewer investment opportunities usually pay dividends regularly (DeAngelo et al., 2006). Therefore, Firm Size (the natural logarithm of a firm's total assets) and return on assets (ROA) (the ratio of earnings before depreciation to total assets) are included to control profitability (Jordan et al., 2018). As a measure of liquid assets, the variable Cash represents the ratio of cash and marketable securities (Mkt Sec.) to total assets (Cash & Mkt Sec./Total Assets) (Bates et al., 2009). Leverage indicates the financial health of an organization. If leverage increases it indicates the possibility of future financial distress and it also increases the external financing cost, resulting in alternative methods of emptying free cash flow (Fenn & Liang, 2001; Jensen, 1986). Therefore, Debt to Equity Ratio is included, calculated as the total debt divided by the total shareholders' equity (Florackis & Sainani, 2018). To control investment opportunities, Market to Book Ratio, defined as the book value of assets minus the book value of equity plus

the market value of equity divided by the book value of assets (Florackis & Sainani, 2018), and capital expenditure (CAPEX)[56] (the natural logarithm of CAPEX) are included. Cash Flow (the cash flow divided by the total assets) is also included (Benson, Lian, & Wang, 2016). Following Atanassov and Mandell (2018), EVOL_ROA is controlled, measured as the standard deviation of earnings before interest, tax, depreciation and amortization (EBITDA) divided by total assets over the prior three-year period, as Jagannathan, Stephens, and Weisbach (2000) suggest that firms may hoard cash as a precautionary motive due to potential uncertainty in generating enough internal cash, consequently, reducing the dividend payment. Prior literature reports high growth firms with many investment opportunities have a tendency to reduce the level of free cash flow and vice versa (Holder, Langrehr, & Hexter, 1998). Lower cash flow indicates low agency cost; therefore, firms pay a lower dividend to reduce agency cost. Consequently, Sales Growth is controlled, measured as the mean yearly sales growth rate over the past three years (Brockman et al., 2016). Finally, external financing becomes costly due to AI, making top executives reluctant to go for external financing at the time of investment opportunity, which leads to underinvestment (Deshmukh, Goel, & Howe, 2013; Fama & French, 2002). Fama and French (2002) also suggest that increasing financial slack by lowering dividend payment is one of method by which firms deal with underinvestment. This reasoning indicates that dividend payment should have negative relationship with the level of AI. As such, AI is controlled, measured as tangible assets (ratio of property, plant and equipment to total assets).

4.4 Empirical results

4.4.1 Descriptive statistics

Table 4 presents descriptive statistics of the dependent, independent and control variables used in the regression analyses. The results show that 39% of Australian publicly listed firms pay a dividend. These firms pay, on average, $0.72 as a dividend against $1 of their net earnings, and 61% of these firms extend a franking

[56] Though CAPEX data is readily available in Morning Star (DatAnalysis) and no further calculations are needed, it is measured as the ratio of capital expenditure to total assets.

credit to their shareholders. CEO Tenure is on average (median) 6.43 (6) years. Furthermore, among the CEOs in Australia, 34% are founders and 92% have functional expertise. The mean CompRatio is 1.64, meaning that CEOs' earnings are 1.64 times more than their nearest top executive. Among the publicly listed firms in Australia, 27% have employees or directors with 5% or more of the total outstanding shares, and institutional shareholders have 49.54% of the shares in their possession. Among the CEOs in Australia, 3% are female and CEO Age is on average 52 years. In Australia, Board Size is almost seven members, of whom 35% are independent. Co-Opt Directors is almost 4, indicating that Australian CEOs may enjoy more power given that, as Daily and Johnson (1997) argue, interdependent directors are nominated by the CEO and therefore they are more likely to be sympathetic to the CEO's decision-making. Such CEOs enjoy more power if the board has a larger number of interdependent directors. Boards of directors in Australian listed firms meet more than six times a year on average. The mean (median) value of the log of Australian listed firms' Total Assets is 18.10 (17.97). The average ROA, Debt to Equity Ratio and Market to Book Ratio are -0.17, 0.35, and 2.34 respectively. Moreover, research and development (R&D) expenditure to Total Assets is 23% on average. The average log of CAPEX, Sales Growth, AI and Cash Flow/Total Assets are 16.04, -0.34, 0.23 and -0.05 respectively.

Table 4: Descriptive statistics

	Mean	Median	St. Dev	25%	75%	Skewness	Kurtosis
Dividend decision and payout							
Dividend Pay	0.39	0.00	0.49	0.00	1.00	0.45	1.20
DPR	0.72	0.62	0.54	0.45	0.82	3.66	20.96
CEO power variables							
P_INDEX_1	0.00	-0.11	1.00	-0.99	0.60	-0.15	2.71
P_INDEX_2	0.00	0.06	1.05	-0.68	0.71	0.04	2.66
CEO Duality	0.12	0.00	0.33	0.00	0.00	2.28	6.18
CEO Tenure	6.43	6.00	3.97	3.00	9.00	0.69	2.55
CEO Founder	0.34	0.00	0.48	0.00	1.00	0.66	1.44
CEO Ownership	0.08	0.02	0.15	0.00	0.08	2.88	11.64
CEO Functional Experience	0.92	1.00	0.27	1.00	1.00	-3.13	10.80
CompRatio	1.64	1.28	1.58	1.00	1.86	3.62	19.95
Co-Opt Director	3.69	4.00	2.53	2.00	5.00	0.72	4.35
Moderating variables							
5% Blockholder	0.27	0.00	0.44	0.00	1.00	1.06	2.12
% InstOwner	49.54	53.43	28.34	27.55	72.62	-0.29	1.97
InstOwner_HighConcen	0.50	1.00	0.50	0.00	1.00	-0.01	1.00
InstOwner_LowConcen	0.25	0.00	0.43	0.00	0.00	1.16	2.35
Franking Credit	0.61	1.00	0.49	0.00	1.00	-0.44	1.19
Corporate governance variables							
CEO Gender	0.03	0.00	0.16	0.00	0.00	5.96	36.48
CEO Age	51.91	52.00	6.52	48.00	55.00	0.13	4.32
Board Size	6.38	6.00	2.64	5.00	8.00	1.89	10.97
Board Independence	0.35	0.38	0.26	0.07	0.57	0.07	2.68
Board Meetings	6.62	6.00	6.14	2.00	9.00	1.68	8.28
Firm characteristics							
Firm Size (Log)	18.10	17.97	2.28	16.54	19.53	0.08	3.69
ROA	-0.17	0.01	0.61	-0.16	0.08	-4.49	26.87
Debt to Equity Ratio	0.35	0.11	0.77	0.00	0.49	2.55	16.00
Market to Book Ratio	2.34	1.42	3.04	0.96	2.40	4.37	25.74
CAPEX (Log)	16.04	16.18	2.76	14.33	17.99	-0.31	2.91
Cash Flow/Total Assets	-0.05	0.02	0.30	-0.10	0.10	-2.51	10.73
Cash & Mkt Sec./Total Assets	0.22	0.12	0.24	0.05	0.31	1.49	4.41
EVOL_ROA	0.22	0.06	0.54	0.02	0.17	5.35	35.49
Sales Growth	0.34	0.12	1.98	-0.02	0.35	18.99	568.19
AI	0.23	0.13	0.24	0.03	0.38	0.99	2.87

This table provides the descriptive statistics of all the variables used in this study. After excluding duplicate observations, observations related to the financial and real estate industries and firms with missing values, 10,213 firm-years have complete information at the CEO, board and firm levels from 2001 to 2015. Additionally, the sample consists of 3,947 firm-year observations for the DPR. Details of each variable used are presented in Appendix A

4.4.2 Correlation matrix

Table 5 presents the Pearson correlation matrix of the variables used in this study. The relationship between the dividend payment decision and *P_INDEX_1* is not significant. A positive significant relationship exists between the dividend payment decision and variables such as CEO Gender, CEO Age, Board Size, Board Independence, Board Meetings, Firm Size, ROA, Dividend Pay, CAPEX, Cash Flow/Total Assets, AI, Debt to Equity Ratio, Market to Book Ratio, R&D to Total Assets and Cash Flow. However, negative significant relationships exist between Cash & Mkt Sec./Total Assets, EVOL_ROA and Sales Growth. The correlation between Firm Size and CAPEX is 0.83, which exceeds the multicollinearity threshold of 0.8 (Hair et al., 2010). Therefore, the regression model from equations (1) and (2) was run dropping CAPEX and keeping Firm Size, and subsequently the regression model from equations (1) and (2) was rerun dropping Firm Size and keeping CAPEX, to determine whether multicollinearity affects the sign and magnitude of the study. The regression results confirm that multicollinearity does not affect the sign and magnitude. Therefore, equations (1) and (2) remain as is for the rest of the analysis.

Table 5: Pearson correlation analysis

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	Dividend Pay	1.00																
(2)	P_INDEX_1	-0.01	1.00															
(3)	CEO Gender	0.03**	-0.03***	1.00														
(4)	CEO Age (Log)	0.08***	0.05***	-0.04***	1.00													
(5)	Board Size (Log)	0.31***	-0.23***	0.03**	0.02	1.00												
(6)	Board Independence	0.24***	-0.08***	0.02*	0.10***	0.13***	1.00											
(7)	Board Meetings (Log)	0.42***	-0.16***	0.02	0.07***	0.51***	0.38***	1.00										
(8)	Firm Size (Log)	0.58***	-0.16***	0.00	0.12***	0.57***	0.38***	0.62***	1.00									
(9)	ROA	0.34***	0.00	0.01	0.02	0.13***	0.13***	0.22***	0.47***	1.00								
(10)	Debt to Equity Ratio	0.15***	-0.05***	0.00	0.01	0.13***	0.04***	0.14***	0.25***	0.13***	1.00							
(11)	Market to Book Ratio	-0.14***	0.09***	0.00	-0.03**	-0.09***	-0.05***	-0.12***	-0.29***	-0.43***	-0.14***	1.00						
(12)	CAPEX (Log)	0.44***	-0.11***	-0.03**	0.09***	0.46***	0.32***	0.50***	0.83***	0.36***	0.19***	-0.21***	1.00					
(13)	Cash Flow/Total Assets	0.43***	0.01	-0.00	0.03**	0.15***	0.16***	0.26***	0.53***	0.74***	0.13***	-0.41***	0.50***	1.00				
(14)	Cash & Mkt Sec./Total Assets	-0.32***	0.06***	0.01	-0.06***	-0.16***	-0.06***	-0.20***	-0.40***	-0.30***	-0.24***	0.33***	-0.38***	-0.38***	1.00			
(15)	EVOL_ROA	-0.26***	-0.01	-0.01	-0.03***	-0.11***	-0.11***	-0.20***	-0.38***	-0.65***	-0.11***	0.36***	-0.28***	-0.47***	0.25***	1.00		
(16)	Sales Growth	-0.05***	0.01	-0.02	-0.02*	-0.00	-0.01	-0.01	0.01	0.02*	0.01	-0.00	0.04***	0.03***	-0.01	-0.01	1.00	
(17)	AI	0.18***	-0.09***	-0.01	0.03***	0.20***	0.10***	0.22***	0.39***	0.14***	0.22***	-0.13***	0.47***	0.23***	-0.36***	-0.12***	0.06***	1.00
	N	10,697																

This table summarizes the results of the Pearson correlation matrices among the variables used in this study. Refer to Appendix 1 for the definition of these variables. The correlations are * statistically significant at the 10% level; ** statistically significant at the 5% level; and *** statistically significant at the 1% level.

4.4.3 Multivariate analysis

4.4.3.1 CEO power and the dividend payment decision

Table 6 present the multivariate analysis of this study[57]. Panel A reports the relationship between the CEO power index and the dividend payment decision and panel B reports the relationship between the CEO power index and dividend payment. Model 1 of panel A presents the result of the standard regression model, where the likelihood of paying a dividend is positively and significantly related to the dividend payment decision dummy variable, Dividend Pay, meaning that if any firm pays a dividend in the previous year, there is a strong possibility that the firm will pay a dividend in the current year, which is consistent with the findings of DeAngelo et al. (2006) and Balachandran et al. (2019). The relationship between CEO power and the dividend payment decision is positive and statistically significant at the 1% level, meaning that powerful CEOs make a positive dividend payment decision to pass a positive signal to the shareholders and to avoid the excessive monitoring from the capital market. To verify the robustness of the results presented in model 1, Eq. (1) was rerun by including GLS RE estimates of regression and the results are presented in model 2 of panel A of Table 6.[58] The results report a positive and statistically significant association between CEO power and the dividend payment decision and thereby confirm the results presented in model 1 of panel A of Table 6. Model 1 of panel A reports that corporate board characteristics such as board meetings and board independence are positively and statistically significantly associated with the dividend payment decision, which is consistent with prior literature (Boumosleh & Cline, 2015). Contrary to the findings of Alzahrani and Lasfer (2012) and Balachandran et al. (2019), a significant relationship is not found between the dividend payment decision and ROA. However, consistent with Boumosleh and Cline (2015), the relationship between Firm Size and the dividend payment decision is positive and statistically significant, meaning that large firms are willing to pay more dividends when compared with small firms. Additionally, the Debt to Equity Ratio has a negative and the Market

[57] Panel A present the result from the logistic regression and Panel B present the result from of the pooled OLS regression with clustered robust standard errors at firm level.
[58] Please see section 3.2 for more details.

to Book Ratio has a positive association with the dividend payment decision and the relationships are statistically significant (Alzahrani & Lasfer, 2012; Boumosleh & Cline, 2015). Similar to Li and Zhao (2008) report that firms with higher AI are reluctant to pay a dividend, a negative and significant relationship between AI and the dividend payment decision is found.

Panel B of Table 6 reports the relationship between the DPR at year *t* and at one-year lag periods *t-1* and *t+1* and the CEO power index *P_INDEX_1* with all other control variables at period. Model 3 of panel B of Table 6 presents the negative and statistically significant relationship between DPR and *P_INDEX_1* at the 1% level at time *t*. The economic magnitude of this relationship is also significant. For example, a 1 standard deviation increase in CEO power index, i.e. *P_INDEX_1* (1.00), results in a -7.26% decrease in a firm's level of DPR relative to the sample mean (0.72). The sign and magnitude of the result indicates that powerful CEOs of dividend payee firms reduce the dividend payment at time *t*. Liu and Jiraporn (2010) found that dominant CEOs, as a result of agency conflicts, receive lower credit ratings. Consequently, due to the lower credit rating sourcing, external funds becomes difficult and expensive for these powerful CEOs to source at a time of necessity. Therefore, powerful CEOs may need to forgo some investment opportunities, which may help them to implement personally motivated investment strategies to secure personal benefit within the agency theory framework. However, lowering the DPR may provide that flexibility to the powerful CEOs to implement investment strategies in favour of their own empire building by compromising shareholders' best interests. The sign and magnitude of the control variables used in this model are consistent with prior literature. For example, board characteristic variables such as Board Size and Board Independence are negatively and significantly associated with DPR. Consistent with the findings of Balachandran et al. (2019), Firm Size is positively and significantly related to DPR, indicating that larger firms are inclined to payout a larger portion of net profit as dividend. Consistent with Atanassov and Mandell (2018), the Debt to Equity Ratio is significantly and positively associated with DPR, indicating that firms can still pay a higher dividend even when their Debt to Equity Ratio is high, which implies that they

are not overburdened with debt servicing.[59] Market to Book Ratio and Cash Flow/Total Assets are also found to be significantly and positively related to DPR, consistent with Atanassov and Mandell (2018) and Balachandran et al. (2019). Furthermore, EVOL_ROA and Sales Growth are significantly and negatively related to the payout ratio. meaning that firms with growth potential have a lower dividend payment.

Endogeneity related to the CEO power index may be present in this study and subsequently creates a concern. Therefore, the CEO power index may be an endogenous variable and may be impacted by the previous year's and the future year's level of DPR. In order to verify that causality runs from the CEO power index to DPR, this study uses a one-year lag between the measures of DPR and the CEO power index because a lagged dependent variable is one of the ways to address endogeneity. As such, to verify the robustness of this benchmark result, measure DPR is measured at time *t-1* and *t+1*. Model 5 of panel B of Table 6 presents the result of *P_INDEX_1* and DPR in year *t-1*, and the results show a negative and significant relationship. Model 7 of panel B of Table 6 presents the results of *P_INDEX_1* and DPR in year *t+1* and the results still show a negative and significant relationship.

In order to test the sensitivity of the results presented in models 3, 5 and 7, Eq. (2) was rerun by including GLS RE estimates of regression, and the results presented in models 4, 6 and 8 of panel B of Table 6 show that the relationship among all three models is negative and significant. The sign and magnitude of the control variables are also consistent with the benchmark results. As such, the results reported from the sensitivity analysis in models 4, 5, 6, 7 and 8 further confirm the benchmark result reported in model 3. Overall, the panels A and B of Table 6 support hypotheses H1(a) and H1(b).

[59] See, for example, Atanassov and Mandell (2018) for the impact of corporate governance and dividend payments in reducing the conflicts of interest between bondholders and shareholders.

Table 6: Multivariate analysis

	Panel A: Dividend payment decision		Panel B: Payout					
	Firm level cluster	Random effect	Firm level cluster	Random effect	Firm level cluster	Random effect	Firm level cluster	Random effect
Variables	Dividend Pay	Dividend Pay	DPR	DPR	DPR (*t-1*)	DPR (*t-1*)	DPR (*t+1*)	DPR (*t+1*)
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Dividend Pay (*t-1*)	3.5611***	1.8742***						
	(38.6391)	(31.2491)						
P_INDEX_1	0.1271***	0.0936***	-0.0519***	-0.0510***	-0.0494***	-0.0431***	-0.0446***	-0.0341***
	(2.9431)	(3.5164)	(-5.2339)	(-4.2706)	(-4.6645)	(-3.6142)	(-3.9525)	(-2.6626)
CEO Gender	0.5105**	0.2068	0.0512	0.0547	0.1162**	0.1430**	0.0101	-0.0287
	(2.0453)	(1.2449)	(0.9293)	(0.9044)	(1.9751)	(2.4351)	(0.2237)	(-0.4415)
CEO Age (Log)	0.5346*	0.3737*	0.1751***	0.2317***	0.1523**	0.1411	0.1232*	0.1653*
	(1.6454)	(1.7801)	(2.5968)	(2.6647)	(2.4664)	(1.6427)	(1.9518)	(1.7929)
Board Size (Log)	-0.1255	-0.1505	-0.1024***	-0.0494	-0.1368***	-0.0682*	-0.1060***	-0.0265
	(-0.8308)	(-1.6391)	(-2.9104)	(-1.2462)	(-3.8224)	(-1.7524)	(-2.7786)	(-0.6557)
Board Independence	0.6615***	0.3447***	-0.1000**	-0.1083**	-0.0187	0.0092	-0.0805*	-0.0763
	(3.3141)	(2.7502)	(-2.3428)	(-2.1522)	(-0.4380)	(0.1868)	(-1.8764)	(-1.4825)
Board Meetings (Log)	0.1227	0.1048**	0.0556***	0.0468**	0.0416***	0.0278	0.0384***	0.0202
	(1.5721)	(2.1284)	(3.6277)	(2.2802)	(2.6429)	(1.3928)	(2.7567)	(0.9586)
Firm Size (Log)	0.4489***	0.3215***	0.0399***	0.0319**	0.0233*	0.0041	0.0361***	0.0234
	(8.5390)	(9.5261)	(2.9629)	(2.0849)	(1.6650)	(0.2750)	(2.6533)	(1.4962)
ROA	2.0633**	0.3573**	-0.6898***	-0.6543***	-1.8163***	-2.3516***	0.0580	0.2800**
	(2.2732)	(2.5650)	(-3.3916)	(-4.9199)	(-3.0553)	(-13.5772)	(0.3442)	(2.0550)
Debt to Equity Ratio	-0.1386**	-0.1273***	0.0535**	0.0326*	0.0542***	0.0355*	0.0380*	-0.0007
	(-2.2349)	(-3.5034)	(2.4607)	(1.6814)	(2.8058)	(1.7383)	(1.9154)	(-0.0315)
Market to Book Ratio	0.0186	0.0191	0.0192**	0.0100	0.0464***	0.0458***	0.0004	-0.0078
	(0.7573)	(1.2043)	(2.2838)	(1.0781)	(3.3307)	(5.2457)	(0.0628)	(-0.9495)
CAPEX (Log)	0.0090	0.0246	-0.0507***	-0.0498***	-0.0281***	-0.0155	-0.0322***	-0.0205*
	(0.2582)	(1.1870)	(-4.5143)	(-4.5619)	(-2.7032)	(-1.4634)	(-3.1274)	(-1.8566)
Cash Flow/Total Assets	3.9918***	2.1919***	0.3777**	0.2545**	0.2220	0.0850	-0.0078	-0.2545**
	(6.4580)	(10.3317)	(2.5403)	(2.0583)	(1.1858)	(0.6436)	(-0.0505)	(-1.9811)
Cash & Mkt Sec./Total Assets	-0.3713	-0.1680	-0.1824**	-0.1094	0.0337	0.2094**	0.1379	0.2705***
	(-1.2644)	(-1.0827)	(-2.2246)	(-1.1950)	(0.3154)	(2.3851)	(1.2561)	(2.9968)
EVOL_ROA	-0.7454	-0.1339	-0.5324**	-0.4876**	0.1797	0.2853*	-0.2401**	-0.2662*
	(-1.4067)	(-0.9753)	(-2.2549)	(-2.2293)	(1.0256)	(1.7646)	(-2.2526)	(-1.9189)
Sales Growth	0.0043	0.0022	-0.0088*	-0.0058	-0.0023	-0.0011	-0.0081**	-0.0052
	(0.2202)	(0.2477)	(-1.8287)	(-1.2099)	(-0.4166)	(-0.2391)	(-2.0016)	(-1.1468)
AI	-0.6643***	-0.3054**	-0.0830	-0.0626	-0.0828	-0.0801	-0.0187	0.0154
	(-3.1757)	(-2.2613)	(-1.4372)	(-0.8532)	(-1.5120)	(-1.1144)	(-0.3510)	(0.2030)
Year effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-11.6840***	8.2639***	0.3161	0.0889	0.3841	0.5142	0.2420	-0.0899
	(-8.1431)	(8.7709)	(1.1399)	(0.2377)	(1.3883)	(1.4029)	(0.9693)	(-0.2291)
Observations	10,213	10,213	3,768	3,768	3,947	3,947	3,542	3,542
Pseudo R-squared/ R-squared	0.6884		0.0636		0.0856		0.0528	
chi^2		2992.62		151.8		340.1		111.7

This table contains the results of logistic regression presented in panel A and the pooled OLS regression with cluster-robust standard errors at firm level in panel B of the dividend payment decision and DPR with the CEO power index P_INDEX_1 reported in Eq. (1) and Eq. (2) respectively. Logistic and OLS regressions are run by adding year and industry fixed effects in all regressions. Panel B of this table presents the relationship between DPR at year *t* and at one-year lag periods *t-1* and *t+1* and P_INDEX_1. As a robustness check, this table also presents the result of the RE model of all tests presented in main model. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5 and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

4.4.3.2 CEO power and the effect of internal and external monitoring mechanisms

Since corporate governance research (see e.g. (Florackis & Ozkan, 2009; Khan, 2006) indicates that shareholders can play a significant role in monitoring organization decisions taken by the top executives, in order to capture whether internal and external monitoring mechanisms affect a powerful CEO's dividend payment decision and DPR, internal, i.e. 5% Blockholder, and external, i.e. % InstOwner, monitoring variables are interacted with *P_INDEX_1* to gauge the impact on the dividend payment decision. Panel A of Table 7 represents the interaction result of *P_INDEX_1* and the internal and external monitoring variables on the dividend payment decision. The interaction term of model 1 of panel A of Table 7 shows that the coefficient of 5% Blockholder is positive and statistically significant at the 1% level, suggesting a strong influence of blockholders on firms' dividend payment decisions. Subsequently, the coefficient on *P_INDEX_1* and 5% Blockholder interaction is found to be positive and significant at the 1% level. One interpretation of this finding is that the presence of a 5% Blockholder mitigates the agency cost and influences the decision more strongly than a standalone relationship.[60] Model 6 of panel B of Table 7 represents the interaction result of *P_INDEX_1* and the internal monitoring variables on DPR. The result shows that the coefficient of 5% Blockholder is not significant but when it interacts with *P_INDEX_1*, the result is positive and statistically significant at the 1% level, meaning that even though powerful CEOs prefer to reduce DPR to ensure flexibility and the ability to implement their personal empire-building strategy, the presence of a strong internal monitoring mechanism helps to reduce agency costs and increases the dividend payment. Therefore, models 1 and 5 of Table 7 confirm hypotheses H2(a) and H2(b).

Models 2, 3 and 4 of panel A and models 6, 7 and 8 of panel B of Table 7 represent the interaction result of *P_INDEX_1* and the external monitoring variables

[60] The standalone coefficient of P_INDEX_1 is 0.0170 and the interaction term's coefficient is 0.0277 indicates that due to the interaction, the coefficient increases by 63%. So, the relationship is stronger for P_INDEX_1 and 5% Blockholder interaction.

(% InstOwner) on the dividend payment decision and DPR. % InstOwner of model 2 of panel A of Table 7 reports a negative and statistically significant relationship with the dividend payment decision, but when it interacts with *P_INDEX_1*, the result shows an insignificant relationship, consistent with Balachandran et al. (2019).[61] Two more variables are therefore constructed to further investigate whether low concentrations of institutional ownership and high concentrations of institutional ownership have any interaction effect with *P_INDEX_1* on the dividend payment decision. Model 3 of panel A of Table 7 reports that the coefficient on *P_INDEX_1* and InstOwner_HighConcen interaction is not significant. Similarly, model 4 of panel A of Table 7 also reports that the coefficient on *P_INDEX_1* and InstOwner_LowConcen interaction is also not significant. Therefore, external monitoring variables do not have any impact on the dividend payment decision when interacting with the CEO power index in an imputation tax environment.

Models 6, 7 and 8 of panel B of Table 7 represent the result from the external monitoring variables (InstOwner, InstOwner_HighConcen and InstOwner_LowConcen) interaction result with *P_INDEX_1* on DPR. Like the dividend payment decision, all models report that the interaction effect is not significant.[62] Therefore, for both the dividend payment decision and the DPR, the institutional owner does not influence a powerful CEO's dividend payment decision or affect the dividend payment within the dividend payee firms.[63] Therefore, model 2, 3 and 4 and model 6, 7 and 8 of Table 7 suggest that external monitoring variables do not have any impact on powerful CEOs, which can influence corporate dividend policy.

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[61] Balachandran et al. (2019) report that domestic institutional ownership does not have any relationship with the dividend payment decision or payout ratio in the Australian setting.

[62] Grinstein and Michaely (2005) report that concentration of shareholdings by institutional holders or higher institutional holdings do not cause a firm to pay a higher dividend. The result appears to be not statistically significant.

[63] To check the robustness of this result, the alternative measure of CEO power index P_INDEX_2 was also used in the interaction model of internal and external monitoring mechanisms with consistent results.

Table 7: CEO power index P_INDEX_1 and effect of internal and external monitoring mechanisms

	Panel A: Dividend payment decision				Panel B: Payout			
Variables	**Dividend Pay**	**Dividend Pay**	**Dividend Pay**	**Dividend Pay**	**DPR**	**DPR**	**DPR**	**DPR**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
P_INDEX_1	0.0170***	0.0266***	0.0268***	0.0263***	-0.0720***	-0.0477**	-0.0515***	-0.0517***
	(3.9723)	(3.7196)	(5.5239)	(6.1009)	(-5.1013)	(-2.5547)	(-3.5393)	(-4.3477)
5% Blockholder	0.0473***				0.0152			
	(5.7670)				(0.7354)			
P_INDEX_1 x 5% Blockholder	0.0277***				0.0587***			
	(3.5196)				(3.1315)			
% InstOwner		-0.0004***				-0.0001		
		(-2.8360)				(-0.3238)		
P_INDEX_1 x % InstOwner		0.0000				-0.0000		
		(0.1841)				(-0.1443)		
InstOwner_HighConcen			-0.0096				-0.0068	
			(-1.3667)				(-0.3946)	
P_INDEX_1 x InstOwner_HighConcen			0.0010				0.0040	
			(0.1374)				(0.2134)	
InstOwner_LowConcen				0.0036				-0.0130
				(0.4648)				(-0.5904)
P_INDEX_1 x InstOwner_LowConcen				0.0034				0.0103
				(0.4379)				(0.4894)
Corporate governance variables	YES	YES	YES	YES	YES	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-2.0532***	-1.9951***	-2.0174***	-2.0183***	0.3904	0.3940	0.4050	0.4048
	(-17.7155)	(-17.0047)	(-17.3683)	(-17.3796)	(1.3959)	(1.3812)	(1.4521)	(1.4449)
Observations	10,697	10,665	10,697	10,697	3,947	3,934	3,947	3,947
R-squared					0.0882	0.0857	0.0857	0.0858
Pseudo R-squared	0.4819	0.4804	0.4795	0.4794				

This table contains the results of logistic regression presented in panel A and the OLS regression with cluster-robust standard errors in panel B of dividend payment decision and DPR with the CEO power index P_INDEX_1 respectively with a moderation effect of internal and external monitoring mechanism. Logistic and OLS regressions are run by adding year and industry fixed effects in all regressions. Additionally, panels A and B also represent the interaction result of high concentration and low concentration of institutional ownership with P_INDEX_1 on the dividend payment decision and DPR respectively. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

4.4.3.3 Franked and unfranked dividends

Franked dividends are those dividends paid by Australian companies on their earnings that are taxed in Australia. The Australian imputation tax system allows Australian resident shareholders to receive a tax credit for the corporate tax paid, which is subsequently offset against their personal tax liabilities. On the other hand, dividends paid on earnings that are earned outside Australia are termed unfranked dividends and they do not carry any tax credit. Therefore, the franked and unfranked nature of the dividend may influence powerful CEOs' dividend payment decision. Given the franked and unfranked dichotomy, a partitioning testing is performed.[64]

Table 8 presents the results for how powerful CEOs influence dividend policy when the dividend carries franking credits or when it does not, following the imputation and traditional tax systems. Model 1 of Table 8 reports the relationship between *P_INDEX_1* and the dividend payment decision when the dividend carries no franking credit and the result reported is not statistically significant. On the other hand, the relationship between *P_INDEX_1* and the dividend payment decision is positive and statistically significant at the 1% level when the dividend carries a franking credit, meaning the franking credit feature does influence powerful CEOs' dividend payment decision.

Model 2 of Table 8 reports the relationship between *P_INDEX_1* and DPR when the dividend carries no franking credit and the result shows a negative and significant association. However, powerful CEOs from the dividend payee firms that include the franking credit feature also reduce the DPR and the result is significant at the 1% level. From the coefficient, it may be said that powerful CEOs from the dividend payee firms with an unfranked dividend feature reduce the DPR by 8.45%, whereas the reduction is 4.53% for the dividend payee firms with a franking credit feature.

[64] Without dividing our sample into subsamples, the Stata command using a single hash was used to capture the results of the partitioning test.

Table 8: Effect of franking credits on CEO power index P_INDEX_1

Variables	Dividend Pay	DPR
	Model 1	**Model 2**
P_INDEX_1 x Without Franking Credit	0.0055	-0.0847*
	(1.0089)	(-1.7414)
P_INDEX_1 x With Franking Credit	0.0395***	-0.0453***
	(8.3550)	(-4.3987)
CEO Gender	0.0340	0.1156**
	(1.6261)	(1.9617)
CEO Age (Log)	0.1292***	0.1532**
	(4.7257)	(2.4791)
Board Size (Log)	-0.0344***	-0.1358***
	(-2.8625)	(-3.8130)
Board Independence	0.1029***	-0.0193
	(6.0047)	(-0.4502)
Board Meetings (Log)	0.0536***	0.0437***
	(7.9614)	(2.7469)
Firm Size (Log)	0.1095***	0.0225
	(31.3806)	(1.5978)
ROA	-0.0494***	-1.8181***
	(-5.1470)	(-3.0526)
Debt to Equity Ratio	-0.0214***	0.0538***
	(-4.2602)	(2.7823)
Market to Book Ratio	0.0130***	0.0459***
	(9.4089)	(3.3034)
CAPEX (Log)	-0.0052**	-0.0279***
	(-2.2782)	(-2.6744)
Cash Flow/Total Assets	0.3028***	0.2270
	(15.0793)	(1.2114)
Cash & Mkt Sec./Total Assets	-0.0948***	0.0289
	(-5.8118)	(0.2690)
EVOL_ROA	-0.0005	0.1781
	(-0.0693)	(1.0069)
Sales Growth	-0.0093***	-0.0024
	(-2.9013)	(-0.4258)
AI	-0.0651***	-0.0889
	(-3.7213)	(-1.6151)
Year effects	YES	YES
Industry effects	YES	YES
Constant	-2.0057***	0.4126
	(-17.2924)	(1.4938)
Observations	10,697	3,947
Pseudo R-squared /R-squared	0.4805	0.0860

This table presents the result of partitioning test given the franked and unfranked dichotomy of the dividend. Model 1 of Table 8 reports the relationship between P_INDEX_1 and dividend payment decision when the dividend carries no franking credit. Model 2 of Table 8 reports the relationship between P_INDEX_1 and DPR when the dividend carries no franking credit. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

Finally, these results indicate the likelihood of powerful CEOs to make a positive dividend payment decision is stronger and their reduction rate for DPR is smaller in an imputation tax environment when compared to the traditional tax system.[65] Therefore, the results in Table 7 confirm hypotheses H4(a) and H4(b).

4.5 Robustness check

4.5.1 Alternative measures of the CEO power index

The results from the benchmark models show a positive and significant relationship between *P_INDEX_1* and the dividend payment decision, as well as a negative and significant relationship between *P_INDEX_1* and DPR. To verify the results from the benchmark models, in this section an alternative measure of CEO power index is used. Following the structural power dimension of Finkelstein (1992) and Daily and Johnson (1997), three power proxies (CEO Duality, CompRatio and Co-Opted Director) are used and PCA is implemented to construct an alternative measure of CEO power index, i.e. *P_INDEX_2*.[66] Models 1 and 2 of panel A of Table 9 report that the previous year's dividend payment decision strongly influences the current year's dividend payment decision. Additionally, they further report that the alternative measure of CEO power index *P_INDEX_2* is positively and significantly associated with the dividend payment decision at both the 5% and 10% levels. Models 3, 4, 5, 6, 7 and 8 of panel B of Table 7 present the negative and statistically significant relationship between *P_INDEX_2* and DPR. Therefore, the overall results of Table 9 further support the results presented in Table 6.

[65] To check the robustness of the results, the alternative measure of CEO power index P_INDEX_2 was also used in the partitioning test considering the franked and unfranked nature of the dividend model with consistent results.
[66] Please see section 3.3.2 for details.

Table 9: Alternative measures of independent variable

	Panel A: Dividend payment decision		Panel B: Payout					
	Firm level cluster	Random effect	Firm level cluster	Random effect	Firm level cluster	Random effect	Firm level cluster	Random effect
Variables	Dividend Pay	Dividend Pay	DPR	DPR	DPR (*t-1*)	DPR (*t-1*)	DPR (*t+1*)	DPR (*t+1*)
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Dividend Pay (*t-1*)	0.6846***	1.8783***						
	(65.8653)	(31.2311)						
P_INDEX_2	0.0059**	0.0442*	-0.0279***	-0.0190*	-0.0358***	-0.0380***	-0.0317***	-0.0239**
	(2.3105)	(1.7949)	(-3.2972)	(-1.9382)	(-4.1272)	(-3.8677)	(-3.6197)	(-2.3207)
CEO Gender	0.0227	0.1889	0.1114*	0.1428**	0.0468	0.0483	0.0041	-0.0331
	(1.4502)	(1.1433)	(1.8850)	(2.4264)	(0.8480)	(0.7963)	(0.0905)	(-0.5076)
CEO Age (Log)	0.0302	0.3872*	0.1393**	0.1257	0.1692**	0.2384***	0.1237*	0.1738*
	(1.5004)	(1.8342)	(2.2219)	(1.4496)	(2.4500)	(2.7170)	(1.9091)	(1.8657)
Board Size (Log)	-0.0201**	-0.2071**	-0.0998***	-0.0480	-0.0584*	-0.0165	-0.0679*	-0.0050
	(-2.2782)	(-2.2565)	(-2.8104)	(-1.2229)	(-1.6521)	(-0.4124)	(-1.8168)	(-0.1228)
Board Independence	0.0501***	0.3381***	-0.0065	0.0170	-0.0853**	-0.0980*	-0.0680	-0.0681
	(4.0503)	(2.6953)	(-0.1523)	(0.3441)	(-1.9920)	(-1.9451)	(-1.6003)	(-1.3233)
Board Meetings (Log)	0.0113**	0.0974**	0.0446***	0.0301	0.0591***	0.0481**	0.0409***	0.0212
	(2.2661)	(1.9786)	(2.8244)	(1.5089)	(3.8461)	(2.3396)	(2.9299)	(1.0115)
Firm Size (Log)	0.0333***	0.3141***	0.0298**	0.0088	0.0456***	0.0370**	0.0413***	0.0267*
	(11.6129)	(9.3070)	(2.1302)	(0.5882)	(3.3725)	(2.4204)	(3.0316)	(1.7137)
ROA	-0.0035	0.3545**	-1.8143***	-2.3475***	-0.6930***	-0.6507***	0.0685	0.2902**
	(-0.4778)	(2.5453)	(-3.0313)	(-13.5357)	(-3.3824)	(-4.8892)	(0.4061)	(2.1308)
Debt to Equity	-0.0106***	-0.1254***	0.0524***	0.0333	0.0523**	0.0306	0.0361*	-0.0025
	(-2.8624)	(-3.4586)	(2.6974)	(1.6303)	(2.3842)	(1.5758)	(1.8128)	(-0.1172)
Market to Book	0.0068***	0.0216	0.0449***	0.0452***	0.0182**	0.0100	-0.0001	-0.0077
	(7.6608)	(1.3648)	(3.1995)	(5.1636)	(2.1567)	(1.0689)	(-0.0176)	(-0.9373)
CAPEX (Log)	0.0008	0.0275	-0.0308***	-0.0168	-0.0527***	-0.0507***	-0.0341***	-0.0211*
	(0.4742)	(1.3269)	(-2.9825)	(-1.5836)	(-4.6740)	(-4.6412)	(-3.3179)	(-1.9151)
Cash Flow/Total Assets	0.1289***	2.2172***	0.2234	0.0852	0.3791**	0.2554**	-0.0227	-0.2598**
	(8.5529)	(10.4644)	(1.1896)	(0.6444)	(2.5469)	(2.0640)	(-0.1478)	(-2.0232)
Cash & Mkt Sec./Total Assets	-0.0118	-0.1652	0.0297	0.2093**	-0.1900**	-0.1193	0.1355	0.2680***
	(-0.9625)	(-1.0641)	(0.2761)	(2.3774)	(-2.3092)	(-1.2999)	(1.2296)	(2.9676)
EVOL_ROA	0.0029	-0.1512	0.1995	0.2908*	-0.5024**	-0.4805**	-0.2301**	-0.2636*
	(0.6734)	(-1.0934)	(1.1549)	(1.7966)	(-2.1058)	(-2.1952)	(-2.1686)	(-1.9004)
Sales Growth	0.0006	0.0022	-0.0020	-0.0009	-0.0087*	-0.0057	-0.0079*	-0.0050
	(0.2744)	(0.2492)	(-0.3605)	(-0.1918)	(-1.7331)	(-1.1847)	(-1.9035)	(-1.1051)
AI	-0.0258**	-0.3158**	-0.0684	-0.0726	-0.0709	-0.0590	-0.0042	0.0216
	(-2.0398)	(-2.3355)	(-1.2612)	(-1.0092)	(-1.2251)	(-0.8009)	(-0.0785)	(0.2854)
Year effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-0.5586***	8.1324***	0.2969	0.4721	0.1909	-0.0729	0.1045	-0.2136
	(-6.3360)	(8.5287)	(1.0482)	(1.2588)	(0.6652)	(-0.1904)	(0.4041)	(-0.5327)
Observations	10,213	10,213	3,947	3,947	3,768	3,768	3,542	3,542
Pseudo R-squared/ R-squared	0.7293		0.0818		0.0605		0.0508	
chi^2		2988.08		330.1		148.1		110.1

This table contains the results of logistic regression presented in Panel A and the OLS regression with cluster-robust standard errors in Panel B of dividend payment decision and DPR with the alternative measures of CEO power index P_INDEX_2 reported in Eq. (1) and Eq. (2) respectively. Logistic and OLS regressions are run by adding year and industry fixed effects in all regressions. Panel B of this table also presents the relationship between DPR at year *t* and at one-year lag periods *t-1* and *t+1* and P_INDEX_2. As a robustness check, this table also presents the results of the RE model of all tests presented in main model. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively. Details of each variable used in the study are presented in Appendix A.

4.5.2 Effect of the "two strikes" rule

The compensation of CEOs is always a matter of interest in industry and academic research (Australian Council of Superannuation Investors, 2018, July 17; Palomino & Peyrache, 2013). The formation of their compensation package, how their pay is determined and who plays an important role in setting it are very important factors. The managerial power enjoyed by CEOs can play a significant role in influencing this remuneration. Daily and Johnson (1997) report that CEOs who receive a high compensated compared to the other executives in the organization may enjoy an increased ability to influence the board of directors and therefore increase their power. The *Australian Government Corporations Amendment (Improving Accountability on Director and Executive Remuneration) Act 2011* (Cth) enacted what is known the "two strikes" rule. Under this legislation, if 25% or more of the investors cast a dissenting vote for two consecutive years to approve the remuneration report at the annual shareholder meetings, then the board of directors need to resign, except the CEO, and they may then face re-election. The main reason behind these rules is to give more power to the shareholders so that the actions of the board may be monitored and controlled. Therefore, after implementation of this legislation, CEOs' remuneration will be directly monitored by the shareholders, which may limit the power of the CEO. As such, to investigate whether the "two strikes" rule has any impact on powerful CEOs' dividend payment decision and DPR, a new variable was constructed to partition the sample. As the "two strikes" rule was enacted in 2011, if the year is 2012, 2013, 2014 or 2015, these are coded "1", which has been named "After Two Strikes Rule", and if the year is 2008, 2009, 2010 or 2011, these are coded "0", which has been named "Before Two Strikes Rule".[67]

Table 10 presents the results for how powerful CEOs influence dividend policy before and after implementation of the "two strikes" rule. Model 1 of Table 10 reports the relationship between *P_INDEX_1* and the dividend payment decision before implementation of the "two strikes" rule and the result is positive and statistically

[67] By following propensity score matching technique, a logistic regression was run by pooling the treatment and control groups and calculate the propensity scores for each firm-year observation. In the logistic model, Board Size, CEO Age, Firm Size, CAPEX, Market to Book Ratio, Sales Growth, AI and industry and year effects were included to calculate the propensity score.

significant at the 1% level. Additionally, after implementation of the "two strikes" rule, the association between *P_INDEX_1* and the dividend payment decision is still positive and significant at the 1% level. However, before implementation of the "two strikes" rule, the coefficient for powerful CEOs' dividend payment decision is increased by 3.22% whereas after the "two strikes" rule, the increase is 2.68%, meaning that the "two strikes" rule negatively influences powerful CEOs' dividend payment decision.

Model 2 of Table 10 reports the relationship between *P_INDEX_1* and DPR before and after implementation of the "two strikes" rule and the result is negative and statistically significant at the 1% level for both before and after implementation of the "two strikes" rule. Similar to the dividend payment decision, the implementation of the "two strikes" rule also reduces the reduction rate of dividend payout from 5.62% to 3.49%. Although the result is in the same direction for both variables, the impact of the "two strikes" rule gives credence to the conjecture that after implementation of this legislation, CEOs' remuneration will be directly monitored by the shareholders, which may limit the power of the CEO.

Table 10: Effects of the "two strikes" rule on the CEO power index P_INDEX_1

Variables	Dividend Pay	DPR
	Model 1	**Model 2**
P_INDEX_1 x Before Two Strikes Rule	0.0322***	-0.0562***
	(4.5220)	(-2.7136)
P_INDEX_1 x After Two Strikes Rule	0.0268***	-0.0742***
	(3.4239)	(-3.4982)
CEO Gender	0.0158	0.0977
	(0.5433)	(1.4403)
CEO Age (Log)	0.1256***	0.2773**
	(2.8758)	(2.4664)
Board Size (Log)	-0.0153	-0.1057
	(-0.8177)	(-1.6372)
Board Independence	0.1484***	0.0202
	(5.5998)	(0.2838)
Board Meetings (Log)	0.0334***	0.0222
	(3.2558)	(0.8507)
Firm Size (Log)	0.0978***	0.0342*
	(18.0692)	(1.6463)
ROA	-0.0376***	-1.4892**
	(-2.6352)	(-2.1001)
Debt to Equity Ratio	-0.0244***	0.0566*
	(-3.2944)	(1.8317)
Market to Book Ratio	0.0160***	0.0375*
	(7.2850)	(1.8944)
CAPEX (Log)	-0.0001	-0.0453***
	(-0.0301)	(-2.9339)
Cash Flow/Total Assets	0.3154***	0.1166
	(10.3785)	(0.5114)
Cash & Mkt Sec./Total Assets	-0.0671***	0.1132
	(-2.6562)	(0.7885)
EVOL_ROA	-0.0024	0.1824
	(-0.2168)	(0.5147)
Sales Growth	-0.0240***	0.0558
	(-4.3711)	(0.6505)
AI	-0.0909***	-0.0201
	(-3.4731)	(-0.2473)
Year effects	YES	YES
Industry effects	YES	YES
Constant	-1.7597***	-0.0872
	(-9.3604)	(-0.1850)
Observations	4,896	1,822
Pseudo R-squared /R-squared	0.4696	0.1077

This table presents the result of how powerful CEOs influence dividend policy before implementation of the 'two strikes' rule and after implementation. Model 1 of this table reports the relationship between P_INDEX_1 and the dividend payment decision before implementation of the 'two strikes' rule. Model 2 of this table reports the relationship between P_INDEX_1 and DPR before and after implementation of the 'two strikes' rule. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels respectively. Details of each variable used in the study are presented in Appendix A.

4.6 Dealing with endogeneity

After completing a number of tests for both the main and additional analyses, a positive relationship between *P_INDEX_1* and dividend policy is found. However, the statistical significance, sign and magnitude of these tests may be biased if CEO

power, which is the variable of interest in this study, is correlated with the error term from the analysis. Consequently, endogeneity bias can cause inconsistent estimates, leading to incorrect inferences and misleading conclusions. In the following sections, such endogeneity concerns are addressed by undertaking additional econometrics analyses.

4.6.1 Propensity score matching

To address powerful CEO and firm matching concerns, the propensity score matching (PSM) econometrics technique is undertaken. To obtain proper and unbiased estimates, it is necessary to properly specify the relationship between the dependent variables, i.e. the dividend payment decision and DPR with the CEO power proxy, in multiple regression analysis. If the relationship is not properly specified, it creates a problem called "functional form misspecification" (FFM). Rosenbaum and Rubin (1983) suggest that PSM can address and mitigate this concern by decreasing the dependency on the specification of the relationship between variables. In PSM, observations are chosen from the treatment group and control groups on a number of criteria using the estimated possibility of receiving the treatment to compare the dividend policy between two groups of firms. As such, PSM may address the endogeneity that may arise from the CEO firm matching concern.

The PSM technique is implemented in two steps. First, a treatment and a control group are created from the independent variable. A dummy variable is constructed for *P_INDEX_1*. The newly constructed variable receives a value of "1" for CEOs who fall above or equal to the 80th percentile of the respective CEO power indices and "0" otherwise based on year and industry. By implementing this isolation technique, a treatment group is created with a high concentration of CEO power.

In the first stage, a logistic regression is run by pooling the treatment and control groups and the propensity scores for each firm-year observation are calculated.[68] In the logistic model, CEO Age, Board Size, Board Interaction, Firm

[68] A covariate balance test (unreported) was also conducted to verify that the firms in the treatment and control groups are identical in terms of observable characteristics. It was found that none of the differences between the firms' observable characteristics in the treatment and control groups were statistically significant.

Size, Market to Book Ratio, Cash & Mkt Sec./Total Assets and industry and year effects are included in order to calculate the propensity score. In the second stage, the calculated propensity score is used to match each CEO with a high concentration of power to a CEO with a low concentration of power. During this stage, the nearest-neighbour matching technique without replacement is used as suggested by Leuven and Sianesi (2003),[69] and 2,745 matches are found for CEOs with high concentration of power for *P_INDEX_1*. The final panel observation for PSM includes 5,035 for the dividend payment decision and 1,596 for DPR.

Fig. 1 Matching of CEOs with high and low concentrations of power

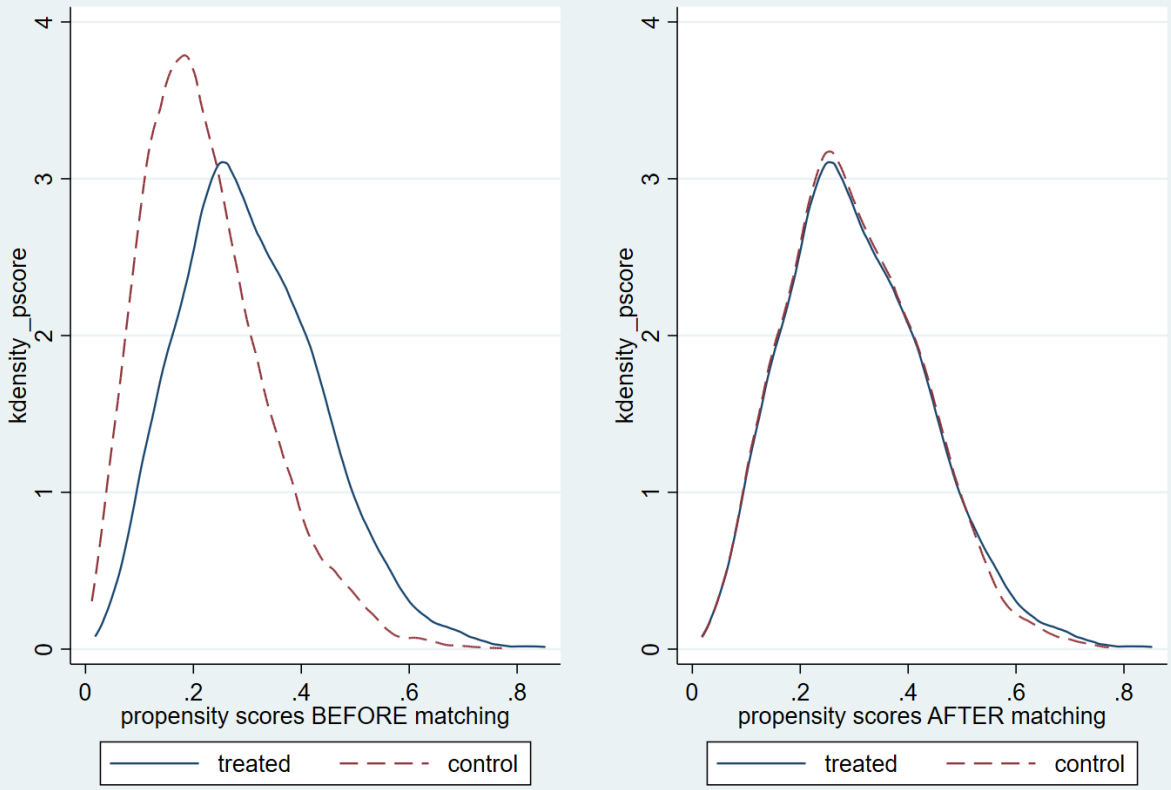

Figure 1 graphically presents the matching of the treatment group, i.e. CEOs with a high concentration of power (solid blue line), and the control group, i.e. CEOs

[69] To ensure accurate matching, the maximum difference between the propensity scores of the two groups was set so as to not exceed 0.05. In addition to this, the control group and treatment group were matched based on industry and year.

with a low concentration of power (red dashed lines), based on the propensity score before and after the matching has taken place.

Models 1 and 2 of Table 11 report the PSM results of the dividend payment decision and DPR. After matching CEOs with a high concentration of power to CEOs with a low concentration of power, in model 1, the relationship between CEOs with a high concentration of power and the dividend payment decision is found to be positive and statistically significant at the 1% level. In model 2, the magnitude of the relationship between CEOs with a high concentration of power and DPR is found to be negative and significant. Therefore, these results suggest that CEOs with a high concentration of power make a positive dividend payment decision in order to provide a positive signal to the board of directors, shareholders and the capital market, but they reduce the dividend payment in order to achieve the flexibility they need to achieve their personal objective. Overall, the results presented in Table 11 confirm the results presented in Table 6.[70]

[70] To check the robustness of the result, the alternative measure of CEO power index P_INDEX_2 was used in the PSM model with consistent results.

Table 11: Propensity score matching (PSM) (P_INDEX_1)

Variables	Dividend Pay	DPR
	Model 1	**Model 2**
P_INDEX_1	0.0347***	-0.0325***
	(7.1377)	(-2.9092)
CEO Gender	0.0350	0.1009
	(1.0097)	(1.2280)
CEO Age (Log)	0.0710*	0.1721**
	(1.8844)	(2.0181)
Board Size (Log)	-0.0105	-0.1123**
	(-0.6173)	(-2.0174)
Board Independence	0.1030***	-0.0290
	(4.3250)	(-0.4459)
Board Meetings (Log)	0.0529***	0.0979***
	(5.0701)	(4.1974)
Firm Size (Log)	0.0965***	0.0351*
	(18.9654)	(1.8903)
ROA	-0.0470***	-1.2105**
	(-3.4064)	(-2.0424)
Debt to Equity Ratio	-0.0239***	0.0067
	(-3.2789)	(0.2041)
Market to Book Ratio	0.0103***	0.0262*
	(6.1132)	(1.8326)
CAPEX (Log)	-0.0021	-0.0413***
	(-0.6694)	(-3.0428)
Cash Flow/Total Assets	0.3131***	0.2434
	(11.4729)	(1.1483)
Cash & Mkt Sec./Total Assets	-0.0317	0.0334
	(-1.4085)	(0.2735)
EVOL_ROA	-0.0012	0.2472
	(-0.0970)	(1.1671)
Sales Growth	-0.0126***	-0.0158***
	(-4.5050)	(-2.8652)
AI	-0.0378	0.1255
	(-1.4764)	(1.4325)
Year effects	YES	YES
Industry effects	YES	YES
Constant	-1.5700***	0.0436
	(-9.6987)	(0.1162)
Observations	5,035	1,596
Pseudo R-squared/ R-squared	0.4614	0.0830

This table reports the results from the PSM analysis for treatment (high concentration of CEOs' power) and control (low concentration of CEOs' power) groups. The treatment (high concentration of CEOs' power) group includes those firms whose CEOs' power indices fall above or equal to 80th percentile across all firms in year *t*. The control (low concentration of CEOs' power) group includes those firms whose CEOs' power indices fall below 80th percentile across all firms in year *t*. The propensity score in this table is predicated as a logit function of CEO Age, Board Size, Board Interaction, Firm Size, Market to Book Ratio, Cash & Mkt Sec./Total Assets and industry and year effects. Subsequently, each CEO with high concentration of power is matched with that of a CEO with low concentration of power, which follows the nearest-neighbour matching technique without replacement as suggested by Leuven and Sianesi (2003). Therefore, logit and OLS regression model with cluster-robust standard errors are run by adding year and industry fixed effects. The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels respectively. Details of each variable used in the study are presented in Appendix A.

4.6.2 Two-step system generalized method of moments (GMM) estimator

The GMM estimator is a robust econometrics technique that can address different types of endogeneity concerns such as unobserved panel heterogeneity, simultaneity and dynamic endogeneity (Ullah et al., 2018).[71] Arellano and Bover (1995) and Blundell and Bond (1998) suggest that to address such endogeneity concerns, the GMM estimator is a very good and effective econometrics tool. Roodman (2009) suggests that the GMM estimator is a robust and efficient method of correcting heteroscedasticity and autocorrelation. Therefore, the two-step system GMM estimator is used. Furthermore, the two-step system GMM estimator can control the dynamic relationship between the current values of CEO power, the previous year's dividend payment decision and the past values of DPR (see (Wintoki et al., 2012).

Table 12 reports the results of the two-step system GMM estimator. To test the presence of serial correlation, the Arellano–Bond test was run; if the error terms are correlated over time, the GMM estimator will be inconsistent in the dynamic panel model. The results in models 1 and 2 show that the null hypothesis is rejected in the first test (AR(1)) but not in the second test (AR(2)), showing no evidence that the errors are correlated over time. Subsequently, the *Hansen J-test* is run to determine the validity of the instrumental variables, and the test yields a *p-value* 0.717 for model 1 and 0.805 for model 2, with both models yielding a *p-value* greater than 5%. Therefore, as indicated by the *Hansen J-statistic*, the null hypothesis cannot be rejected, meaning that the instruments used in this study are valid (Hansen, 1982).

[71] In this study, panel data is used containing cross-sectional observation over time, which may cause endogeneity concerns such as unobserved panel heterogeneity (Coakley et al., 2006). Additionally, this study may omit some variables that are not included within the set of the control variables affecting the dividend payment decision and DPR. In this study, powerful CEOs may choose only those firms that have the intention to pay a dividend. Likewise, firms that have a policy to pay dividends may also recruit powerful CEOs. These factors may bias the results by postulating simultaneous causality. Furthermore, the variable used in this study may have some measurement error (for example, the construction of the CEO power indices). Therefore, implementing the two-step system GMM estimator can address and alleviate the aforesaid endogeneity concern.

Table 12: Two-step system GMM estimators (P_INDEX_1)

Variables	Dividend Pay	DPR
	Model 1	**Model 2**
Dividend Pay (*t-1*)	0.9153***	
	(13.6301)	
DPR (*t-1*)		0.4899***
		(3.0647)
P_INDEX_1	0.0268***	-0.0490**
	(2.6519)	(-2.2669)
CEO Gender	0.1608	-0.3526**
	(0.8417)	(-2.2397)
CEO Age (Log)	-0.0862	0.4657
	(-0.7674)	(1.5907)
Board Size (Log)	0.1305	0.0803
	(0.8721)	(0.4399)
Board Independence	0.1086	-0.0010
	(0.7195)	(-0.0055)
Board Meetings (Log)	0.0329	-0.0198
	(0.7701)	(-0.1521)
Firm Size (Log)	-0.0632*	-0.0487
	(-1.7799)	(-0.6457)
ROA	0.1327	-0.1605
	(0.8974)	(-0.3265)
Debt to Equity Ratio	0.0977	0.1845**
	(1.6329)	(2.3788)
Market to Book Ratio	-0.0013	0.0659
	(-0.0697)	(1.6211)
CAPEX (Log)	0.0183	0.0201
	(1.0214)	(0.3324)
Cash Flow/Total Assets	0.0029	-1.1407
	(0.0186)	(-1.4675)
Cash & Mkt Sec./Total Assets	-0.0025	0.3148
	(-0.0165)	(0.8941)
EVOL_ROA	0.0067	-0.9997
	(0.2549)	(-1.4687)
Sales Growth	-0.0052	-0.0073
	(-0.4194)	(-0.3102)
AI	0.0398	-0.4064*
	(0.3911)	(-1.7248)
Year effects	YES	YES
Industry effects	NO	NO
Constant	0.9670	-0.8712
	(1.3637)	(-0.6319)
Observations	10,182	3,355
Hansen (p-value)	15.08 (0.717)	36.73 (0.805)
Diff-Hansen (p-value)	7.37 (0.769)	31.97 (0.518)
AR 1 (p-value)	-8.09 (0.000)	-3.60 (0.000)
AR 2 (p-value)	0.47 (0.637)	1.81 (0.071)

This table presents the results of the two-step system GMM estimator of the dividend payment decision and DPR and the CEO power index P_INDEX_1. Ullah et al. (2018) suggest one of the best way to control different sources of endogeneity such as omitted variables bias, measurement errors, unobserved panel heterogeneity, simultaneity and dynamic endogeneity is to implement the two-step system GMM estimator. The two-step system GMM estimator was run by using xtabond2, a Stata function written by Roodman (2009). The two-step system GMM estimator uses lagged valued as regressors. These lagged levels of dependent variables in Arellano and Bond (1991) estimator are used as instruments in the two-step system GMM estimator to deal with endogeneity. Due to the process of internal transformation, the two-step system GMM estimator reduces the number of firm-year observations. The dynamic panel data system GMM model extends the fixed effects model further by including the lagged value of dependent variable in the regression as instruments, thereby controlling the dynamic nature of endogeneity (Ullah et al., 2018). The t-statistics are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels respectively. Details of each variable used in the study are presented in Appendix A.

To confirm the validity of the additional instrument used in the GMM estimator, the Diff-Hansen test is run, which yields a *p-value* of 0.769 for model 1 and 0.518 for model 2, meaning that the null hypothesis cannot be rejected. Therefore, the Diff-Hansen test confirms the validity of the additional instruments.[72]

To test the dynamic nature of the CEO power index and dividend policy, a lagged dependent variable in the GMM estimator was used. Model 1 of Table 12 reports the relationship between the dividend payment decision in year *t-1* and the dividend payment decision in year *t*. The relationship is positively statistically significant at the 1% level. Therefore, the dynamic nature of the models cannot be rejected. The results also indicate that the previous year's dividend payment decision strongly influences the current year's dividend payment decision. Furthermore, the relationship between dividend payment decision and *P_INDEX_1* is positively and statistically significant. Model 2 of Table 12 reports that the lagged dependent variables are statistically significant and positively associated with DPR at the 1% level. As such, the results also confirm the dynamic nature of the model. The relationship between *P_INDEX_1* and DPR is negative and significant at the 1% level. Overall, the two-step system GMM estimator also confirms the result of the main analysis presented in Table 6 after mitigating the endogeneity concern.

4.7 Conclusion

Given the importance of dividend policy within an organization's financing framework, we seek to determine how firms choose between two financing alternatives: the propensity to pay a dividend or alternatively, spending for investment or acquiring capital goods. Powerful CEOs can use dividend policy decisions to achieve a number of positive and/or negative outcomes for both themselves and the organization. However, the use of internal and external monitoring mechanisms can influence the association between CEO power and dividend payout and we seek to assess this moderating effect. We undertake our empirical examination using a sample

[72] To check the robustness of the result, the alternative measure of CEO power index P_INDEX_2 is run in the GMM model with consistent results.

of 10,213 firm-year observations from 2001 to 2015 listed under the ASX. Australian data enables us to investigate the dividend policy under two different tax systems: the classical tax system and the imputation tax system.

Our initial results indicate that the likelihood of dividend payment is strongly associated with the previous year's dividend payment decision; a logical outcome as the dividend payment decision is a relatively 'sticky' one. Additionally, we show that the relationship between CEO power and the dividend payment decision is positive and statistically significant suggesting that powerful CEOs make a dividend payment decision to send a positive signal to the shareholders to, among other things, avoid the excessive monitoring from the capital market. Subsequently, the relationship between the CEO power index and DPR at year *t* and at one-year lag periods (both before and after) is examined and the result indicates a negative and significant association. One explanation may be due to the agency conflict powerful CEOs experience when implementing investment strategies in favour of their own empire-building and compromising shareholders' best interests. By lowering DPR, powerful CEOs may achieve this flexibility.

It is not enough to explain the standalone relationship between CEO power and dividend policy as this relationship does not exist in a vacuum. Internal and external monitoring variables were brought in as moderating variables to investigate whether these variables can limit CEO power. The direction of the dividend payment decision is still positive and significant when CEO power interacts with 5% Blockholder, and the coefficient of DPR is significant but turns from negative to positive when CEO power interacts with 5% Blockholder. This indicates that, in the presence of strong internal monitoring mechanisms, the dividend payment increases among the dividend payee firms reducing agency costs as well as helping to protect shareholders' rights. This limits the preference for powerful CEOs to diminish DPR and consequently restricts their ability to implement a personal empire-building strategy.

Subsequently, to investigate the impact of Australia's unique imputation tax environment in addition to the classical tax system, partitioning testing is performed given the franked and unfranked dichotomy of the dividend paid. The results of the partitioning test indicates that when the dividend carries no franking credit, the relationship between the CEO power index and the dividend payment decision is not

significant, but with the franking credit, the relationship is positive and significant. Irrespective of the franked and unfranked features, the relationship between the CEO power index and DPR is negative and significant but the coefficient suggests that powerful CEOs from the dividend payee firms having an unfranked dividend feature reduce DPR whereas the reduction for the dividend payee firms include the franking credit feature. Therefore, powerful CEOs cannot ignore the value of the tax benefit shareholders may receive from franking credits.

Our results are supported by a range of additional analyses, including the use of the generalized least squares and random effect models, the introduction of the "two strikes" rule in Australia and, in the area of econometrics, we confirm our analyses using propensity score matching and the two-step system generalized method of moments. Consequently, our results have a number implications for firms and key stakeholders such as regulators and board monitoring mechanism within firms.

4.8 Appendices

Appendix A: Variable definitions

Variables	Definition
Dependent	
Dividend Pay	Dummy variable equal to 1 if the firm pays dividends and 0 otherwise.
DPR	Total dividends paid during the year divided by accounting earnings, where accounting earnings equal net profit after tax.
Independent	
CEO Duality	Dummy variable equal to 1 if the CEO is also the chair of the board and 0 otherwise.
CEO Tenure	Number of years the CEO has spent as CEO in the firm.
CEO Founder	Dummy variable equal to 1 if the CEO is a founder and 0 otherwise. The CEO is considered as a founder if they are in the role of CEO at the time of incorporation or join within the one year after the firm's date of incorporation.
CEO Ownership	Percentage of CEO shares out of the total outstanding shares of the firm.
CEO Functional Experience	Dummy variable equal to 1 if the CEO has any prior experience in any industry or function of an organization before acting as CEO and 0 otherwise.
Compensation Ratio (CompRatio)	Ratio of the CEO's total compensation to the total compensation of the top executive of the firm who receives the highest compensation after the CEO.
Co-Opted Director:	Number of directors who are appointed by the current CEO. A higher ratio of co-opted directors on the board equates to the CEO having greater power.
P_INDEX_1	Principal component from a PCA based on the following variables: CEO Duality, CEO Tenure, CEO Founder, CEO Ownership and CEO Functional Experience.
P_INDEX_2	Principal component from a PCA based on the following variables: CEO Duality, CompRatio and Co-Opted Director.
Moderating variable	
5% Blockholder	The fraction of 5% or higher shares held by officers and directors.
% InstOwner	Institutional ownership as the ratio of shares that institutions own in the firm divided by the total number of shares outstanding.
InstOwner_HighConcen	High concentration of institutional holdings is a dummy variable that equals 1 if the concentration level is in the 75th quartile and above of the sample and 0 otherwise.
InstOwner_LowConcen	Low concentration of institutional holdings is a dummy variable that equals 1 if the concentration level is in the 25th quartile of the sample and 0 otherwise.
Franking Credit	Dummy variable equal to 1 if the firm pays franking credit and 0 otherwise.
Corporate governance characteristics	
CEO Gender	Dummy variable equal to 1 if the CEO is female and 0 otherwise.
CEO Age	Natural log of the CEO age, where CEO age is the age of the CEO in years.
Board Size	Number of members sitting on the board of directors.
Board Independence	Ratio of independent directors to total directors of the firm.
Board Meetings	Total number of board meetings held during the year.
Firm characteristics	
Firm Size	Natural log of the book value of the total assets.
ROA	Earnings before depreciation to total assets.
Debt to Equity Ratio	Total debt divided by the total shareholders' equity.
Market to Book Ratio	The book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets.
Log (CAPEX)	Natural log of capital expenditure defined as the ratio of capital expenditure to total assets.
Cash Flow/Total Assets	Cash flow divided by the total assets.
Cash & Mkt Sec./Total Assets	The ratio of cash and marketable securities to total assets.
EVOL_ROA	The standard deviation of EBITDA divided by total assets over the prior three-year period.
Sales Growth	Mean of yearly sales growth rate of the past three years.
AI	The ratio of tangible assets to total assets. Tangible assets includes property, plant and equipment.
Industry_Dummy	Industry dummy according to the global industry classification standard.
Year_Dummy	Year dummy according to the financial year end.
ε	Error term

CHAPTER 5

Conclusion

5.1 Introduction

This thesis empirically examines three unique but interrelated topics about the CEO characteristics and corporate financing decisions. The CEO is the key person in an organization, and financial decisions are one of the most important areas of the organization and one on which an organization's success largely depends on. Chapter two focused on CEO power and corporate cash holdings. Chapter three investigated the relationship between outsider CEOs and corporate cash holdings. Chapter four examined the relationship between CEO power and dividend policy with a moderation effect of internal and external monitoring mechanisms from an imputation tax environment.

5.2 Summary of major findings

Chapter two revealed the relationship between CEO power and corporate cash holdings. In this chapter, two CEO power indices and three different measures of cash holdings are used to test the relationship. The results show that all three measures of cash holdings are positively and significantly associated with the two CEO power indices, meaning that powerful CEOs hold more cash than non-powerful CEOs. Opler et al. (1999) argue that to save transaction costs, firms would like to accumulate more cash reserves. Moreover, transaction costs are one of the main concerns when raising funds from external markets. Therefore, to ensure the flexibility and ability to use the organization's cash holdings to invest in a project where the CEO's personal interest is secured, a powerful CEO would want to increase the cash reserves. This study also bridges the gap between behavioural finance and corporate financing decisions by empirically investigating the relationship between CEO power and corporate cash holdings.

Chapter three investigates the relationship between outsider CEOs and cash holdings. The main model of this study presents a strong negative relationship between outsider CEOs and cash holdings, indicating that firms with outsider CEOs hold lower cash. Capturing the impact of the different percentiles, i.e. the 10th, 25th, 50th, 75th, and

90th, of the distribution of cash holdings, this study also uses the SQR regression model. The SQR model reports that outsider CEOs are lowering the cash reserve from low cash holding firms to the higher cash holdings firms and the relationship is significant except at 10th quantile. Additionally, by lowering cash at the time of appointment, outsider CEOs one year after appointment use capital expenditure to grasp at investment opportunities. Subsequently, in the long-run, when their next appointment is imminent, they increase the cash reserve and use dividend payments to tunnel this cash so that they can provide a positive signal to the market about their performance and to ensure their own benefit.

Chapter four examines the relationship between CEO power and dividend policy with a moderation effect of internal and external monitoring mechanism from an imputation tax environment. The empirical result of this study reports that the relationship between the dividend payment decision and the CEO power index is strongly positive and statistically significant, meaning that powerful CEOs take positive dividend payment decisions in order to pass positive signals to the marketplace and to avoid excessive monitoring from the external capital market because dividends act as a tool to mitigate agency cost between management and shareholders. Subsequently, this study investigates the relationship between DPR and the CEO power index among the dividend payee firms, and the results indicate a negative and significant association, validating the inference under the principal-agent relationship. The interaction result between th CEO power index and the internal monitoring variable indicates that powerful CEOs would like to pay a dividend, but due to the presence of internal monitoring variables, i.e. 5% Blockholder, the coefficient is stronger than the coefficient without the interaction. Additionally, the presence of 5% Blockholder changes the sign of the relationship between the interaction variable and DPR, indicating that the internal monitoring mechanism may protect shareholders' rights. However, the external monitoring variable does not have any impact on the CEO power index. This study contributes to the CEO-based dividend literature debate from a monitoring perspective by considering both the classical and imputation tax environment. Additionally, this study also contributes to the debate about whether the CEO matters in the corporate decision-making process and provides evidence that powerful CEOs influence corporate dividend policy

5.3 Limitations

Although this thesis provides several practical contributions as well as a number of contributions to the literature, it has some limitations. First, the data collected for this thesis was from public limited companies listed on the Australian Securities Exchange (ASX). Therefore, the results of this study may not be useful for small, private or family firms not listed on the ASX. Second, the latest corporate governance data available in SIRCA is from 2015. As such, this thesis is not able to present any results after 2015.

5.4 Future research directions

The findings of this thesis help understand the important but unexplored relationship between CEO characteristics, namely CEO power and CEO outsider, and corporate financial decisions, specifically corporate cash holdings and dividend policy. The thesis also provides a good foundation for future research. Fast et al. (2012) argue that the sense of power will lead an individual to be overconfident of one's decision-making accuracy. Therefore, it can be said that a sense of power makes people overconfident, which ultimately influences an individual's decision-making domain. So, future research in the area of CEO characteristics-based literature may focus on investigating the relationship between CEO overconfidence and different proxies of corporate financing decisions. Additionally, outsider CEO appointments also play a significant role in a firm's performance and implementation of a new business model. Therefore, examining the impact of outsider CEO appointments on corporate financing decisions may be a scope for future research.

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