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The moderating effects of CEO power and personal traits on say-on-pay effectiveness: Insights from the Anglo-Saxon economies

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Abstract

This study investigates the efficacy of say-on-pay (SOP) regulation in mitigating excessive CEO compensation and how it is affected by CEO personal traits and the power distribution inside a corporation. Using IV-GMM method and a sample of 1,931 firms from Australia, Canada, the UK, and the USA, we find that shareholder voices are successful in reducing the pay gap between CEOs and the median employee, regardless of the exact nature of the regulation. In addition, older CEOs are associated with lower pay ratios and there are some evidences suggesting that older or female CEOs enhance SOP effectiveness. Further, power distribution manifested through corporate governance mechanisms matters, as increasing board size and director and audit committee independence reduce pay ratio. A measure of CEO power, CEO pay slice, has a significant and large positive explanatory power for the model and its exclusion can greatly exaggerate the estimated impact of SOP on pay ratio. Another measure of CEO power, CEO duality, appears to enhance the potency of SOP slightly. There is also some evidence indicating that ownership concentration enhances SOP effectiveness. Our findings have implications for companies, investors, and regulators concerning the importance of power balance structure within corporations.

KEYWORDS

CEO pay, executive compensation, IV-GMM, pay ratio, power distribution, say-on-pay

1 | INTRODUCTION

This study examines the effectiveness of *say-on-pay* (SOP) regulation implemented in four Anglo-Saxon economies in curtailing excessive CEO compensation, with excessive compensation indicated by *CEO-median pay ratio*. Further, we investigate in what ways this effectiveness is enhanced or diminished by CEO personal characteristics and corporate governance mechanisms (CGMs), with the former measured by age and gender. While the roles of CGMs have been much studied elsewhere, their moderating effects on SOP efficacy viewed through the lens of managerial power distribution (especially those of CEO power and ownership concentration) have been mostly ignored (See, Boone et al., 2020; Crawford et al., 2020). In addition, there is a gap in our

understanding as to what roles have CEO personal characteristics played in moderating the impact of SOP. Our efforts may hence shed new light on the controversial findings of earlier studies.

The growth rate of executive pay has recently caused much debate among investors, academics, and regulators (Brunarski et al., 2015). While regulators in many countries have raised the level of corporate disclosure requirement on compensation policies and packages, shareholders are also seeking to obtain greater influence over the compensation decision processes (Thomas & Van der Elst, 2015). Before the implementation of SOP regulation, the UK was considered to have the best disclosure practice system—comply or explain. It nevertheless failed to conform with the three main principles of directors' remuneration: performance linkage, transparency, and accountability (Alissa, 2015). After the collapse of companies such as Enron Corporation in 2001, shareholders continued to exert pressure on governments to change the status quo (Gregory-Smith et al., 2014). This led the UK Government to introduce Say-on-Pay (SOP) regulation in 2002. Many nations around the world followed suit and embraced SOP regulations. These include the Netherlands, Australia, Japan, Denmark, Norway, Switzerland, South Africa, the USA, Spain, Belgium and France (Stathopoulos & Voulgaris, 2016). The main purpose for adopting this corporate governance mechanism is to minimize managerial excess and to reduce shareholders' concerns over misalignment between the interests of the executives and those of the stockholders (Conyon & Sadler, 2010).

Advocates of SOP claim that shareholders benefit from the obligation which they place on boards of directors to offer managers contracts that better align the interests of the managers and those of the owners. Moreover, the lines of communication between shareholders and managers can be improved by the direct input from owners. In addition, proponents suggest that even if SOP votes are advisory, negative voting outcomes should compel boards to improve the efficiency of manager contracting (Brunarski et al., 2015). Opponents of SOP argue, however, that allowing stockholders to provide input on CEO pays will create additional economic costs, thereby decreasing the wealth of shareholders. Critics also argue that owners are unable to understand, distinguish, and correctly assess alternative remuneration plans, while the boards can determine the best approach to executive compensations because they has specific information (Ferri & Maber, 2013).

Since the adoption of SOP in a number of countries around the world, many studies have investigated the influence of shareholder votes on the level of executive pay, particularly in the UK and the USA. A number of these show that high voting dissent on a CEO's pay can lead to changes in a compensation plan (for the UK studies, see Gregory-Smith et al., 2014; Alissa, 2015. For the US, see Brunarski et al., 2015; Stathopoulos & Voulgaris, 2016; Cuñat et al., 2016; Kimbro & Xu, 2016). In contrast, other studies on UK companies (e.g., Conyon & Sadler, 2010; Ferri & Maber, 2013), American companies (e.g., Burns & Minnick, 2013; Kronlund & Sandy, 2014), and Australian companies (see Faghani & Gyapong, 2019) conclude that the growth of CEO compensation has not been influenced by the SOP ruling in general.

The controversial findings above may in part be explainable by missing explanatory variables. For example, managerial power may render SOP less effective as a governance mechanism (Murphy & Jensen, 2018). Bebchuk and Fried (2003) argue that powerful managers can often impact on the decision process related to the structure and level of their remuneration packages. Bebchuk et al. (2002) also state that managers with more power have a greater capacity to extract rents and to gain excessive pay. In addition, Core et al. (1999) conclude that excessive pay of executives is related to both greater CEO power and weaker corporate governance structure. This view is supported by Henderson et al. (2010), who find that managerial power has a significant impact on executive pay. These observations prompt us to ask to what extent managerial power and governance quality affect the effectiveness of SOP.

Our study is motivated by the new regulation in the USA and the UK called the pay ratio rule. The pay ratio rule, which was adopted under the 2010 Dodd–Frank Wall Street Reform and Consumer Protection Act, became effective on 19 October, 2015 in the USA, but only require disclosures for fiscal years beginning on or after 1 January, 2017. Under this rule, public companies are required to calculate and disclose a *ratio that compares the annual total compensation of their CEO to that of their "median employee"* (henceforth *pay ratio*). Pay ratio disclosure regulations applying to large listed companies with over 250 employees also came into force on 1 January 2019 in the UK, with the first statutory disclosures provided from the start of 2020. Proponents of the pay ratio rule such as labour unions and institutional investors claim that pay ratios provide useful information and would aid them when making SOP voting decisions. On the other hand, critics of the pay ratio regulation (for example, industry trade organizations and other business-related groups) claim that implementing the law will be costly and will not give materially useful information to stockholders given the extensive CEO pay information already disclosed and the lack of meaningful context for interpretation across industries (Crawford et al., 2020).

Pay ratio, we argue, is a better indicator of excessive executive compensation than absolute pay, hence studying the relation between SOP and pay ratio is desirable for those who wish to know the effectiveness of shareholder voices under say-on-pay rules. Since information for calculating pay ratio is not available for the period of our study, we shall employ an alternative proxy, namely the ratio of CEO pay to the median employee pay in the country where the associated company is listed. Earlier studies on the effectiveness of SOP employed alternative measures of excess pay other than pay ratio. For example, Correa and Lel (2016), by using a large sample of companies from 38 nations over the period from 2001 to 2012, find that the adoption of SOP laws led to a reduction in CEO pay slice (CPS), the fraction of the aggregate compensation of the top five executive team captured by the CEO, providing evidence that supports the effectiveness of SOP laws. *CPS however reflects neither pay ratio nor excessive CEO pay*, rather, it represents the power distribution among the top executives hence a measure of internal corporate governance mechanism.

Recent studies engaging with the concept of pay ratio mostly focused on its relationship with performance rather than its relation to SOP regulation and shareholder voices. For example, Banker et al. (2016) test how the gap between the average pay of the top executives and that of the other employees in a company drive firm performance using a sample of Chinese companies. In the same vein, Cheng et al. (2017), examine the association between pay ratio (CEO pay relative to the average worker pay) and firm value/performance for a sample of US firms in 2011. With a wider interest than firm value, Boone et al. (2020), using US data from the first two proxy seasons in which the pay-ratio rule has been in effect, found that reporting higher pay ratios is associated with negative changes in the tone of media coverage, shareholder voting on executive compensation, and employee productivity and morale.

Based on a sample of 1931 firms from Australia, Canada, the UK and the USA, and using IV-GMM estimator, this research documents a significant negative impact of SOP votes on pay ratio. The results are robust after controlling for macroeconomic and firm financial factors. Further, the study finds that, while audit committee independence has the desired curtailing effect on the pay ratio directly, it nevertheless diminishes the potency of SOP, implying that the two governance mechanisms to certain extent cancel out each other's efficacy. CEO power, when measure by CPS, has a large uplifting effect on the pay ratio; when measured by CEO duality, it nevertheless enhances the effectiveness of SOP to a small extent, possibly as a result of board dynamics. Ownership concentration, when measured by the shareholding of the top 10 shareholders, has no direct effect on the pay ratio; but there is some evidence suggesting that it enhances the efficacy of SOP. Furthermore, we find that older CEOs are associated with lower pay ratios. Evidences on the desirable moderating effect of age and gender on SOP potency are mixed across the different empirical models we have estimated, as the corresponding negative coefficients are not always significant.

This research makes a number of contributions to the existing literature. *First*, to the best of our knowledge, this study is the first attempt in investigating the impact of SOP regulation on pay inequality, as measure by the pay ratio between CEO and the median employee. While Correa and Lel (2016) have their eyes set on the managerial pay inequality (the pay gap between CEO and other top managers), the focus of this paper is on pay inequality from the social point of view—that is, the pay gap between CEOs and ordinary employees. This differentiation is important as, by comparing CEO pay to the pay of an ordinary employee (rather than to those of other highly paid executives), we have a perspective into the effectiveness of SOP in its original purpose—to curtail top executive pay in relation to the general employee, not in relation to the top executives. The current study is also different from Cheng et al. (2017), Boone et al. (2020) and Crawford et al. (2020) as they employ the concept of pay ratio and evidences from the US to serve different objectives.

Second, the study covers time periods which are different from that of Correa and Lel (2016). During our sampling period, important SOP regulations changes occurred in Australia and the UK. The UK has adopted a binding SOP regulation since October 2013 for large and medium sized companies (Stathopoulos & Voulgaris, 2016); and the two-strike rule[1] became effective from 1 July 2011 in Australia. These regulation changes are essential in mitigating pay ratio and thus the current study makes a timely contribution to this field. *Third*, our study probe into not only the active role of corporate governance mechanisms, through the lens of power distribution, in curbing excess pay ratio, but also whether or not these mechanisms enhance or diminish the effectiveness of SOP votes. This is in contrast to the prior empirical literature which includes theses mechanisms as control variables only. *Fourth*, the current research seeks to reveal the important influences of CEO personal traits in the effectiveness of SOP votes, a unique approach in the SOP literature as far as we are aware.

1.1 | Why were Australia, Canada, the UK and the USA selected?

Australia, Canada, the UK, and the USA are all part of the Anglo-Saxon economy. The four countries have been

chosen for several reasons. *Firstly*, these four countries have approved different types of SOP regulations and they are currently among the most active markets and have recently experienced significant reforms aimed at promoting shareholder engagement and empowerment (Buchanan et al., 2012). *Secondly*, these countries share a common law system, which has more flexible legislation and offers strong protection for shareholders (Weimer & Pape, 1999). *Thirdly*, under the prevailing corporate regulations, companies in these countries have a unitary board system (one-tier), which comprises executive and outside directors. The latter account for at least two-thirds of members under the Corporate Governance Codes and practices in these countries. *Finally*, the corporate governance systems in these countries are characterized by dispersed equity holding and a broad delegation to management of corporate responsibilities. Also, their mechanisms of executive pay have in common bonus and stock options to align the interests of shareholders and managers (Cernat, 2004; García-Sánchez et al., 2015). Such similarity allows us to tease out other country- and firm-specific factors affecting the effectiveness of SOP voting.

Nonetheless, there are some interesting differences between these countries. (i) The size of the market differs significantly, with the US market being the largest. (ii) The numbers of key provisions within the corporate governance codes are different. The UK and the USA, for instance, have issued the highest number of governance codes (Cuomo et al., 2016). (iii) Although SOP legislation has been introduced in each of these four countries, the type of SOP votes adopted varies across them. The Australian Government, for example, has embraced a two-strike rule, while voluntary & advisory votes have been endorsed by Canada; the UK has changed its SOP law from advisory to binding, when mandatory & advisory votes are in place in the USA. (iv) Their legislated mandatory governance models are also different. While the Sarbanes-Oxley Act SOA (2002), which prescribes one set of practices for all companies in the USA, a "comply or explain" approach is used in other countries. Such a regime allows companies to either voluntarily adopt regulator-endorsed "best practices" or to explain why they have adopted alternative practices that achieve the underlying governance principles embedded in the endorsed best practices (Luo & Salterio, 2014); and (v) the role of the board of directors varies within the institutional and regulatory frameworks in these countries, which also have different types of institutional investors. Investment companies (mutual funds) and investment advisors (i.e., money management companies) are the largest investors in the USA while insurance companies and pension funds predominate in the UK. It is important to distinguish between different types of institutions as they have significantly varying performance policies and hence present distinct pressures on the company and its shareholders (Aguilera et al., 2006; Buchanan et al., 2012). Furthermore, Australian institutional investors are less likely than their US counterparts to seek to use their voting power to impact on company behaviour (Wilson, 2011).

The remainder of this paper is organized as follows. Section 2 contains a literature review and hypotheses development. Methodology and sample selection are discussed in Section 3. Section 4 reports regression results. Section 5 concludes the paper.

2 | HYPOTHESES DEVELOPMENT

Optimal contract theory and managerial power theory are two major theories explaining executive pay. Under Optimal contract theory, pay packages are designed by boards or directors to incentivize CEOs to exert effort, exploit growth opportunities, and reject wasteful projects, while minimizing the cost of doing so (Bebchuk & Fried, 2003; Weisbach, 2007). Accordingly, a firm's board is supposed to design compensation scheme to give executives adequate incentives to increase shareholder value. Restricted stocks and options are often awarded to managers, and in a way to give them inducements, as a means to deal with implicit agency dilemma. Bugeja et al. (2017) provide some insight into the efficient contracting debate on executive pay, and they conclude that most companies with an excessive CPS see CEO pay packages decline in the following year (or 2 years). The authors hence argue that CPS is mostly consistent with an efficient contracting explanation of executive pay.

Empirical facts may appear largely inconsistent with optimal contract, however. For example, CEO wealth looks to bear little relation to firm performance. Such observation leads to the opposing managerial power theory which states that compensation is decided by executives themselves, who seek to maximize their own wealth rather than shareholder value (Bebchuk & Fried, 2003). This highly influential view has sparked calls for major reforms in corporate governance to increase shareholder power. Say-on-pay is one of such reforms.

Managerial power theory assumes that CEO compensation reflects the actions of powerful managers who can influence the terms of their own pay packages, and they do so in a way that camouflages and reduces external public/media scrutiny and criticism (Murphy, 2002). The theory asserts that there is a positive association between rents and managerial power. The steady rise of executive compensation relative to the pay of the average worker in

the Anglo-Saxon economies since the 1980s and especially after the mid-1990s suggests increasing managerial power in extracting rents.

A number of empirical studies have examined the relationship between CEO remuneration and managerial power, with the latter measured in various ways. Core et al. (1999), for example, investigate whether there is a relationship between the level of executive pay and the quality of a company's corporate governance practices. They document that executive pay is greater when the CEO is working as the board chair, when independent directors are 70 or older, and when the directors work on more than three other boards. Likewise, Grinstein and Hribar (2004) find that managers who have more power affect board resolutions and gain considerably larger bonuses. The authors suggest that CEO power (measured by three proxies; a CEO who is also the chairman, who is on the nominating committee, and who is on a relatively small board) plays a vital role in ruling merger and acquisition bonuses. In the same vein, Choe et al. (2014) find that CEO pay is largely supported when the CEO is powerful, with CEO power measured by CPS, the proportion of executive directors on the board, and CEO duality. Their findings also indicate the relevance of managerial power theory in clarifying the link between power and pay, when the concentration is on managerial bargaining power. Van Essen et al. (2015) also provide evidence that when executives have power over the pay-setting process they tend to extract higher levels of total cash and total compensation. These results are consistent with the argument that managerial power is an essential driver of executive pay (Bebchuk et al., 2002).

2.1 | Say-on-pay votes and pay ratio

The key aims of SOP rules are to limit the seemingly excessive level of executive pay, to tighten the link between company performance and manager pay, and to increase the disclosure of executive pay packages in remuneration reports. This study aims to examine to what extent SOP has been successful in curtailing excessive executive pay. The immediate question follows is how to evaluate pay excessiveness.

Earlier studies of SOP and executive compensation largely rely on absolute pay level. For example, Balsam et al. (2016) used this measure when examining pay and SOP voting outcome. There are a few scholars attempted alternative pay measures. For instance, in examining how SOP votes influence the behaviour of shareholders and boards, Alissa (2015) employed the concept of excess pay, with excess pay estimated as the part of the pay not explained by CEO tenure and company financial characteristics (sales, ROA, book value to market value, etc.).

Following the argument in Introduction, this study employs pay ratio as an indicator of excessiveness of executive pay. The relationship between pay ratio and SOP voting outcome has been tested by a few studies recently, primarily in the US context. For instance, Boone et al. (2020), using a sample of Russell 3000 companies for the years 2018 and 2019, show that negative SOP voting outcome increases with higher pay ratio. In the same context, Crawford et al. (2020) also find a positive and significant association between negative SOP votes and pay ratio using a sample of US commercial banks over the period 2010–2017, with pay ratio calculated based on average pay. The current study expands the above study in scope by including four Anglo-Saxon economies and in depth by considering the moderating effects of CEO personal traits and corporate governance mechanisms. Further, the selected sampling periods reflect important recent changes in SOP rules in these countries. On the basis of the above theoretical and empirical arguments, we hypothesize that:

> **Hypothesis 1.** *Higher pay ratio is associated with lower SOP support for executive compensation.*

2.2 | CEO personal traits and pay ratio

As discussed above, CEO power may play an important role in determining executive compensation. Yet, this power may in part be influenced by the personal traits of individual CEOs. We will distinguish such characteristics by age and gender in this study.

The relation between CEO age and CEO compensation has been examined by several studies. Adhikari et al. (2015) document that CEO age is an important variable to consider in the corporate setting of US firms. They argue that older CEOs are rewarded with higher pays than their younger counterparts to encourage risk taking and ethical behaviour. Blackwell et al. (2007) debate that the structures of CEO pay are likely to be different for executive of various ages as a result of the horizon problem which predicts that, as incentive plans based on accounting data will penalize current CEOs and reward their successors, CEOs nearing retirement will forgo valuable capital investment expenditures. Dah and Frye (2017) find that executive age impacts its ability to extract excess pay, with older CEOs linked to significantly greater cash excess compensation. These CEOs may be more powerful and they may prefer less risky forms of pay. Further, Adhikari et al. (2015) conclude that the level of CEO compensation among US companies has increased considerably for older executives as

compared to their younger counterparts after adopting the Sarbanes–Oxley Act (SOX). In contrast, Mcknight et al. (2000) find a weak relation between CEO age and CEO salaries and the association between CEO age and bonus appears to be non-linear in nature for a sample of UK firms. Based on the previous discussion, we develop the following hypothesis

> **Hypothesis 2a.** *The presence of an older CEO increases the effectiveness of SOP in curtailing pay ratio.*

Bugeja et al. (2012) document that managerial power does not provide any conceptual insights into the link between CEO pay and gender, except one can argue that female CEOs are better at capturing boards than their male counterparts. In addition, Khan and Vieito (2013) argue that female CEOs receive less compensation than their male counterparts. This can happen because of female executives are more risk averse than male CEOs, and the differential risk attitudes and characteristics between female CEOs versus male CEOs influence corporate financial decisions. However, the evidence from Khan and Vieito (2013) reveals that companies managed by female executives are associated with better performance compared to those managed by male executives. They also find that firm risk is lower when the CEO is a woman if the board provides the same proportion of stock options to female executives as they do male executives, presumably as an stimulus to female CEOs to take risks. Similarly, Bugeja et al. (2012) report that women who rise through the "glass ceiling" to the level of CEO are rewarded at similar levels to their male counterparts. In contrast, a study of Mohan and Ruggiero (2007) shows that gender plays a role in the level of CEO pay and women are under-compensated. However, prior empirical studies have failed to take account of the moderating effect of gender in the context of SOP votes (e.g., Bao et al., 2020; Boone et al., 2020; Crawford et al., 2020; Ibrahim et al., 2021 and Norman et al., 2020). Thus, the following hypothesis is designed

> **Hypothesis 2b.** *The presence of a female CEO increases the effectiveness of SOP in curtailing pay ratio.*

2.3 | Power distribution and pay ratio

Executive power, as an important determinant of pay ratio, may depend in large part on a company's corporate governance mechanisms, such as ownership structure, the organization and composition of the board, as well as the number of independent directors and inside directors (Bebchuk et al., 2002). Bebchuk and Fried (2003) demonstrate that executives tend to have more power when; i) there is a small fraction of institutional shareholders; ii) the board is relatively inefficient or weak; iii) there is no large outside shareholder, or iv) executives are protected by anti-takeover arrangements. Each of these factors impacts compensation arrangements in the way expected by the managerial power theory. A larger concentration of institutional shareholders, for example, may produce greater scrutiny and monitoring of the executives and the board. In contrast, executive compensation is higher when the board of directors is relatively weak or inactive vis-a-vis the executive. An ineffectual board may arise when the board is large which makes it more tricky for board members to organize in opposition to the manager, when more of the outside directors have been employed by the executive, and when outside directors serve on three or more boards and thus are more likely to be distracted. Moreover, the adoption of anti-takeover provisions makes executives less vulnerable to a hostile takeover (Bebchuk et al., 2002).

2.3.1 | Board size

The size of the board matters as it influences the extent of controlling, monitoring and decision making in a firm (Haniffa & Hudaib, 2006; Ullah, Ahmad, et al., 2018). According to the agency theory, coordination and communication problems can occur when a firm's board has a large number of directors. Larger boards have more disagreements, are less focused, and thereby can be less effective and vigilant in monitoring CEOs (Salama & Putnam, 2013; Joura et al., 2021). Bebchuk et al. (2002) suggest that CEOs have more power when boards are larger, which makes it more difficult for directors to organize in opposition to managers. Hence, we hypothesize:

> **Hypothesis 3a.** *Small board enhances the effectiveness of SOP regulation in curtailing pay ratio.*

2.3.2 | Independent directors

Outside directors are less likely to be influenced by the executives and can strengthen board effectiveness and improve monitoring and financial performance (Salama & Putnam, 2013). Bebchuk et al. (2002) argue that managerial power overwhelms the decision process in a company when a less effective role is played by outside directors. This happens when some outside directors

are supported by CEOs, who tend to prefer those who are unlikely to challenge their pay packages. An outside director may also follow an executive's interests because they are a long-time friend of the manager or because they are beholden to the CEO who has placed them on the board. In such a situation, CEOs are more likely to negotiate an extreme pay package with the board (Bebchuk & Fried, 2003). Kaplan (2012) proclaims that higher quality boards have more independent directors. When outside directors are truly independent, they may help to alleviate the agency problem by monitoring and controlling the opportunistic behaviour of top management (Haniffa & Hudaib, 2006). Thus, our next hypothesis states:

Hypothesis 3b. *Independent directors strengthen the effectiveness of SOP regulation in curtailing pay ratio.*

2.3.3 | Compensation committee independence

Compensation committee independence is vital in promoting shareholder value. In 2003, the U.S. Securities and Exchange Commission (SEC) adopted new listing laws which make it obligatory for companies traded on NASDAQ, NYSE and AMEX to have compensation committees containing fully independent non-executive directors. Compensation committee contains independent outside directors who, in principle, are free from the influence of executives whose pay they recommend (Conyon, 2014). Compensation committee takes advice from the company's Human Resource (HR) department which supplies inside information. Because human resource personnel are employees and may offer advice partial to the incumbent CEO, compensation committee also takes advice from outside compensation consultants.

For many reasons independent non-executive board members may not be fully 'independent.' For example, directors may owe their current board position to the incumbent executive, the directors may be fearful of not having their board positions renewed if they lowball the manager's pay package, the outside directors may be too busy as executives elsewhere, directors may depend too much on information supplied by the executive and the company, they may have family ties to the company, directors may be former employees of the company, or they may have material financial relationships with the company (Conyon, 2014). The inclusion of an executive director in the remuneration committee may also lead to higher executive pay (Voulgaris et al., 2010). Consequently, compensation committee may fail to rein in excess CEO compensation. We thus hypothesize that:

Hypothesis 3c. *Compensation committee independence strengthens the effectiveness of SOP regulation in curtailing pay ratio.*

2.3.4 | Audit committee independence

Audit committees are designed to follow the financial reporting process and to constrain opportunistic managerial reporting. This role reflects the tenets of agency theory and the need to monitor executives to reduce their ability to extract rents from the company (Badolato et al., 2014). In other words, the dominant role of audit committees is to act as an internal control mechanism to effectively monitor the audit processes. Such suggests that audit committees can alleviate agency problems by reducing the information asymmetry between insiders and outsiders (Al-Najjar, 2011). Thus, companies with strong audit committees have more efficient capital allocation decision processes and enjoy a high excess value.

Audit committees have been identified as a powerful source of improvement in corporate governance (Ghafran & O'Sullivan, 2013; Salama & Putnam, 2013). In addition, an efficient and a high-quality financial reporting process provides motivations for managers to pursue investments that are consistent with shareholders' interests and accelerate the termination of poorly performing investments (Salama & Putnam, 2013). Nonetheless, Al-Najjar (2011) demonstrates that companies with strong executives employ more inside directors in the audit committee compared to those with weak executives. Therefore, we expect that an efficient audit committee may negatively impact on the level of CEO pay, especially when the pay is not reflected by a higher quality of financial reports. Subsequently, we develop the following hypothesis:

Hypothesis 3d. *Audit committee independence strengthens the effectiveness of SOP regulation in curtailing pay ratio.*

2.3.5 | Ownership concentration

Ownership concentration is defined by both the number of large-block shareholders and the total percentage of shares they own (Hitt et al., 2012; Ullah & Nasim, 2021). It is an important internal governance mechanism by which the owners can control and influence the management of a firm to reduce agency problems. Francis et al. (2005) argue that with their dominance, concentrated shareholders can direct the strategic policies of the company by placing their chosen people in key positions,

such as CEO or CFO. Further, block-holders ownership can affect managers' policies and decisions because of their substantial voting power and thereby putting pressure on executives to generate suitable financial earning. When the company is performing below its potential, block-holders possibly can discipline managers by not only reducing or dismissing their pay packages but also attempting to dismiss under-performing executives (Oh et al., 2016). In other words, large shareholders can use different formal and informal mechanisms such as their voting power and the power to elect board directors to influence firms' management. Hence, they are more effective than dispersed individual investors in impacting firms (Khan et al., 2005).

The relationship between ownership concentration and CEO compensation has been investigated by many studies. Core et al. (1999) for instance, using a sample of US firms over 1982–1984, finds that block holders, who own more than 5% of the shares of a corporate, have a negative impact on CEO pay. Firth et al. (2007) also document that ownership structure has a significant impact on CEO pay. In particular, companies with substantial government ownership or large outside investors have lower level of CEO pay. Among the Chinese companies, the presence of a foreign shareholder is associated with higher level of CEO compensation. Another empirical study by (Su et al., 2010) state that there is a U-shaped link between ownership concentration and CEO pay among the private firms of China.

After embracing the SOP rule, shareholders especially large shareholders have become more influential since they were given the right to vote on executive deals at annual general meetings. Recently, Ullah et al. (2020) find that institutional and state ownership for all Chinese A-share listed companies over the periods 2008–2016 have respectively a significant positive and negative impact on CEO pay. Furthermore, Oh et al. (2016) argue that old CEOs, compared to their young counterparts, are more likely to make strategic decisions that are aligned with the interests of block-holders because the later may find it relatively easier to move on to other executive positions. Thus, we form the following hypotheses:

> **Hypothesis 3e.** *Higher ownership concentration enhances the effectiveness of SOP regulation in curtailing pay ratio.*

2.3.6 | CEO power

Some earlier studies show that when managers have more bargaining power over boards, they will be better positioned to negotiate for higher pay and pay packages that are less sensitive to their company's performance (Bebchuk & Fried, 2003; Van Essen et al., 2015). Choe et al. (2014), based on a sample of S&P 500 firms for the period of 1999–2008, also find that the implied relation by managerial power theory between CEO power and the level of pay packages is largely supported. However, other studies show mixed results (See. Core et al., 1999; Bugeja et al., 2017). After adopting SOP regulation, Correa and Lel (2016) tested the impact of SOP on CEO power for a large sample of companies from 38 countries over the 2001–2012 periods, with managerial power measured by CPS and conclude that the adoption of SOP has a negative impact on the CEO power and that considerable changes in CEO pay policy has followed such adoption. Thus, the following hypothesis is developed as:

> **Hypothesis 3f.** *Higher CEO power reduces the effectiveness of SOP regulation in curtailing pay ratio.*

3 | DATA AND RESEARCH DESIGN

3.1 | Sample

Our initial sample contains all companies included in S&P/ASX 200, S&P/TSX, FTSE 350, S&P500, S&P600 and S&P400. The sampling period spans 2012–2015, 2014–2016, and 2011–2015, respectively for Australia & Canada, the UK, and the USA. To be included in the sample, a company must meet the following requirements: *First*, companies must have sufficient data during the period of study, particularly data on shareholder votes for all years. *Second*, companies with mergers and acquisitions are dropped from the sample due to missing data from the original companies. From this initial sample, 30 companies were dropped from S&P/ASX, 26 from S&P/TSX, 34 from FTSE 350, and 151 from the lists of S&P400, S&P500 and S&P600. In addition, the value of each variable included in the statistical analysis is restricted to be between the 1st and the 99th percentile to avoid the extreme value problem. The final sample contains 170 firms listed in Australia, 96 in Canada, 316 in the UK, and 1349 in the USA, a total of 1931 firms, (see Table 1).

The sampling period for each country covers a time immediately after a recent SOP regulation change. For example, from October 2013, the nature of shareholder voting changed from *advisory* to *binding* in the UK, hence the UK sample spans the 3 years after the change. Canada adopted a *voluntary & advisory* SOP vote policy in 2012.[2] Our Canadian sample period extends the 4 years following this adoption. In Australia, *mandatory & non-binding* votes on pay package reports became effective on

TABLE 1 Sample selection

	Australia	Canada	UK	USA
Initial sample	200	122[a]	350	1500
Missing firms' data[b]	30	26	34	151
Final sample	170	96	316	1349
Sampling period[c]	2012–2015	2012–2015	2014–2016	2011–2015

[a]Although, the S&P/TSX index comprises 250 firms; the number of companies that adopted the SOP regulation is 122 firms.
[b]Firms are excluded if their SOP voting data are not available, if they were merged with others, or if they have been listed for 1 year only during the period of study.
[c]The sampling period is different among the four countries as they are different in the year of adopting SOP rule or making subsequent change. In Australia, for example, the two-strike rule became active from July 2011; in Canada, advisory voting was approved from 2012; in the UK, a binding vote became effective from October 2013; and in the USA, advisory voting was adopted from 2011.

1 July 2004, but since 1 July 2011 a new legislation called the *two-strikes regulation* became active. Our Australian sample stretches across the 4 years after the two-strike rule became effective. In the USA, the Dodd-Frank Act of 2010 requires large publicly traded firms to provide their shareholders with the opportunity to cast an advisory vote on executive compensation from January 2011.[3] The US sample thus spreads over the 5 years after the implementation of the non-binding SOP rule (Balsam et al., 2016; Stathopoulos & Voulgaris, 2016).

To assemble the pooled panel data, CEO total remuneration, corporate governance mechanisms and firm financial characteristics are gathered from Bloomberg, while median employee wages are collected from Thomson Eikon One. CEO age and gender are obtained from BoardEX. In addition, data on the growth of gross domestic product (GDP) have been obtained from the World Bank. All missing data, especially CEO total pay, CEO age and corporate governance variables, are collected manually from firms' annual reports.[4] In addition, we use the end-of-year exchange rates from the World Bank to convert foreign currency denominated values such as total assets and CEO compensation into US dollar denominated ones.

3.2 | Models and main variables

First, we test the effectiveness of SOP in curtailing pay ratio, controlling for corporate governance mechanisms (CGMs), firm financial characteristics (FFCs), GDP growth rate (GDP), and country and industry dummies.

$$\begin{aligned}\text{CEO pay ratio}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{CGMs}_{it} + a_3\text{FFCs}_{it} \\ & + a_4\text{GDP}_{it} + a_5\text{CountryDummy} \\ & + a_6\text{IndustryDummy} + e_{it}.\end{aligned} \tag{1}$$

Second, we test how CEO age or gender moderates the effectiveness of SOP regulation, with the moderating effect captured by the interaction terms SOPFOR*LnCEOage or SOPFOR*CEO gender, controlling for CGMs, FFCs, GDP, and country and industry dummies:

$$\begin{aligned}\text{CEO pay ratio}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{LnCEOage} \\ & + a_3\text{SOPFOR} * \text{LnCEOage} + a_4\text{CGMs}_{it} \\ & + a_5\text{FFCs}_{it} + a_6\text{GDP}_{it} \\ & + a_7\text{CountryDummy} \\ & + a_8\text{IndustryDummy} + e_{it}.\end{aligned} \tag{2}$$

$$\begin{aligned}\text{CEO pay ratio}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{CEOgender} \\ & + a_3\text{SOPFOR} * \text{CEOgender} + a_4\text{CGMs}_{it} \\ & + a_5\text{FFCs}_{it} + a_6\text{GDP}_{it} \\ & + a_7\text{CountryDummy} \\ & + a_8\text{IndustryDummy} + e_{it}.\end{aligned} \tag{3}$$

We further test how each internal CGM moderates the effectiveness of SOP (see Table 2 for the list of CGMs included in this study):

$$\begin{aligned}\text{CEO pay ratio}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{CGMs}_{it} \\ & + a_3\text{SOPFOR} * \text{CGMs}_{it} + + a_4\text{FFC}_{it} \\ & + a_5\,\text{GDP}_{it} + a_6\text{CountryDummy} \\ & + a_7\text{IndustryDummy} + e_{it}.\end{aligned} \tag{4}$$

Finally, we estimate a model which includes all the moderating effects separately tested above:

$$\begin{aligned}\text{CEO pay ratio}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{LnCEOage} \\ & + a_3\text{SOPFOR} * \text{LnCEOage}_{it} \\ & + a_4\text{CEO gender} + a_5\text{SOPFOR} \\ & * \text{CEO gender} + a_6\text{CGMs}_{it} + a_7\text{SOPFOR} \\ & * \text{CGMs}_{it} + a_8\text{FFCs}_{it} + a_9\,\text{GDP}_{it} \\ & + a_{10}\text{CountryDummy} \\ & + a_{11}\text{IndustryDummy} + e_{it}.\end{aligned} \tag{5}$$

Table 2 summarizes the definitions of the variables used in this research and the data sources.

TABLE 2 Definition of variables and sources

Conceptual variable	Empirical indicator	Definition	Source
Dependent variable			
Excessive CEO compensation	Pay ratio	Pay ratio is computed as the log ratio of CEO total pay to the median workers' salaries in a given country. Total pay is as reported in firm annual report, which includes salary, bonus, other annual pay, the total value of restricted stock and options granted that year, long-term incentive pay-outs, and all other total remuneration.	DataStream and Bloomberg
Explanatory variables			
Shareholder voices	SOPFOR	Number of shareholder votes cast 'For' the approval of executive compensation and is calculated as the number of votes for executive compensation divided by the total votes for and against CEO pay.	Bloomberg database and firm's annual reports
CEO personal traits			
CEO physiological characteristics	CEO age	Natural log of CEO's age in years	BoardEX and firms' annual reports
CEO social characteristics	CEO gender	CEO gender is a dummy that assumes the value 1 if the CEO is a female and zero otherwise.	BoardEX and firms' annual reports
Corporate governance mechanisms			
Effectiveness of board	Ln BSIZE	Ln board size, the natural logarithm of the number of directors on a company's board.	Bloomberg database and firm's annual reports
Moderating effect of board effectiveness	SOPFOR*BSIZE	Interaction variable between SOPFOR and Ln board size.	
Effectiveness of board	INDDIR	The ratio of independent directors on a company's board.	Bloomberg database and firm's annual reports
Moderating effect of board effectiveness	SOPFOR*INDDIR	Interaction term between SOPFOR and the ratio of independent directors on a company's board.	
CEO power	CEO duality	Duality is coded one if the chair and the CEO are the same person and zero otherwise	Bloomberg database
Moderating effect of CEO power	SOPFOR*CEO duality	Interaction term between SOPFOR and CEO duality.	
CEO power	CPS (CEO Pay Slice)	The percentage captured by the CEO of the total annual compensation of the top three—five executives (See Correa and Lel (2016)).	Capital IQ
Moderating effect of CEO power	SOPFOR*CPS	Interaction variable between SOPFOR and CPS.	
Independence of CGM	CCI	The ratio of independent compensation committee members on board.	Bloomberg database and firm's annual reports

TABLE 2 (Continued)

Conceptual variable	Empirical indicator	Definition	Source
Moderating effect of CCI	SOPFOR*CCI	Interaction term between SOPFOR and the ratio of independent compensation committee members on board.	
Independence of CGM	ACI	The ratio of independent audit committee members on board.	Bloomberg database and firm's annual reports
Moderating effect of ACI	SOPFOR*ACI	Interaction term between SOPFOR and the ratio of independent audit committee members on board.	
Ownership concentration	OWNCON top 10	The percentage of shareholding by the top 10 shareholders.	Thomson Reuters Eikon
Moderating effect of ownership concentration	SOPFOR*OWNCON	Interaction term between SOPFOR and ownership concentration.	
Control variables			
Firm financial characteristics (FFC)			
Firm size	Ln TA	The natural logarithm of the total of all short and long-term assets.	Bloomberg database
Short-term market performance	SR	Stock return, calculated as (stock price at the end of year t minus stock price at the end of year $t-1$ plus dividends per share)/ stock price at the end of year $t-1$.	Bloomberg database
Short-term market risk	SV	Stock volatility, measured by the standard deviation of day-to-day logarithmic price changes and expressed in a percentage for the day prior to the current.	Bloomberg database
Financial risk	LEV	Leverage ratio, calculated as the ratio of the total amount of debt relative to assets.	Bloomberg database
Market perceived growth potential	M/B	Market to book ratio, calculated as the ratio of the stock price to the book value per share.	Bloomberg database
Invested growth potential	CAPEX	Capital expenditure. The amount a company spent on purchases of tangible fixed assets divided by total assets.	Bloomberg database
Macroeconomic environment			
Economic growth	GDP growth	Annual GDP growth rate.	World bank

3.3 | Estimation method, endogeneity problem, and the relevance and validity of instruments

The models specified above are estimated using pooled panel data. Recent literature has been widely concerned with endogeneity problems in applied econometric analysis. Endogeneity arises when one or more independent variables are correlated with the error term (Baltagi, 2008). This can be caused by (i) measurement errors in the regressors; (ii) omitted variable bias; (iii) simultaneous equation bias; and (iv) serial correlation in the error term in a dynamic regression model (Gujarati, 2012, p. 300; Ullah, Akhtar, et al., 2018; Ullah et al., 2021). The major problem caused by endogeneity is inconsistency of estimator. Such inconsistency can be identified using Durbin–Wu–Hausman (DWH) test in an OLS regression.[5]

In the current study, DWH test shows that inconsistency and bias indeed exist when OLS estimator is employed. To tackle this issue, we follow Huang et al. (2018) and employ the IV-GMM estimation method, starting by identifying valid and strong instruments (see Chen et al., 2010 for details). We employ external instruments for each country from other countries in our samples. For example, for the UK sample, to obtain valid and strong instruments we choose between two and three instruments (market capitalisation, total assets, and leverage) from the US sample as external instruments. After running the IV-GMM regression, we apply diagnostic tests as explained below.

For each IV–GMM estimation, we rely on the following model specification tests for their validity: first, Hansen *J* statistic is applied to test over-identification restriction; second, Hayashi *C* test is implemented to test for endogeneity (i.e., the null hypothesis that the specified variables are proper instruments [Hayashi, 2000]); and third, *F*-statistic is used to test the correlation between the IVs and the endogenous variables (a test for weak instruments). The *J* and *C* statistics respectively reveal no concern on over-identification and endogeneity, with *p*-values larger than 0.10. The *F*-statistic has *p*-values less than 0.10, indicating that the instrumental variables are not weak. These specification tests provide us with a certain degree of confidence in our results.

4 | RESULTS OF EMPIRICAL ANALYSIS

This section presents the empirical outcomes of the impact of shareholder votes on pay ratio. The analysis is based on a series of panel data regression models. First, we discuss the descriptive statistics. Following that, the IV-GMM estimation results are critically analysed. Finally, a robustness check test takes place.

4.1 | Descriptive statistics

As is shown in Table 3, pay ratios ranged from a minimum of 8.65 to a maximum of 1000.33, with an average value of 182.83. In comparison, the average pay ratio was 163 in the sample of Boone et al. (2020). These extremely high ratios suggest the timeliness of say-on-pay regulation as an external corporate governance mechanism. The voting outcome, however, cast doubts on the effectiveness of say-on-pay—the percentages of votes supporting CEO pay packages had an average value of 91.5%, slightly lower than that reported in Cullinan et al. (2017) but close to the average in Alissa (2015). Such outcome seems to certain extent explainable using variables capturing CEO power, for example, CPS, which had an average value of 43.1%, and CEO duality, which had an average value of 35.7%. These values are similar to those found in Correa and Lel (2016) and Denis et al. (2020).

Looking at other internal corporate governance mechanisms, the board size had a mean value of 9.37, which is higher than the average in Cullinan et al. (2017) but within the range recommended by Lipton and Lorsch (1992) and Haniffa and Hudaib (2006). With an average value of 79.0%, larger than the 57% in Correa and Lel (2016), the ratio of independent directors was high in our sample, suggesting its benign moderating effect on say-on-pay. In comparison, with an average value of 43.0% and 44.0%, respectively, compensation committee independence and audit committee independence were much weaker and may impose dampening moderating effect on say-on-pay. Finally, ownership concentration as represented by the share of the top 10 shareholders ranged from 3% to 68%, with an average and median value of 28.0% and 27.0%, respectively. These modest ownership concentration levels cautiously suggest their constructive influence on say-on-pay.[6]

The mean of CEO age was 56, which is higher than the 52 found in Correa and Lel (2016) but very close to the average in Denis et al. (2020). The descriptive statistic also displays that on average only 3.5% of CEOs were female, which is slightly higher than the 3% in Dah and Frye (2017) over the period 1997–2012.

Among the control variables characterizing firm financial positions, we observe that total asset, market-to-book ratio, short-run return, short-run risk, capital expenditure, and leverage ratio varied widely across different companies in our sample. The mean total asset (USD21800 million) is larger than those in Correa and

TABLE 3 Descriptive statistic for a study's sample

Variables	Mean	Median	Standard deviation	Min	Max
Pay ratio	182.83	122.05	181.790	8.649	1000.329
Ln pay ratio	4.773	4.805	0.977	2.163	6.908
SOPFOR	0.915	0.963	0.125	0.312	0.999
CEO duality	0.357	0	0.479	0	1
SOPFOR*CEO duality	0.319	0	0.440	0	0.999
CPS	0.431	0.424	0.126	0.108	0.799
SOPFOR*CPS	0.392	0.389	0.120	0.034	0.794
Ln CEO age	4.020	4.025	0.123	3.689	4.331
CEO age	56	56	6.884	40	76
SOPFOR*Ln CEO age	3.678	3.838	0.511	1.165	4.325
CEO gender	0.035	0	0.184	0	1
SOPFOR*CEO gender	0.033	0	0.172	0	0.998
BSIZE	9.370	9	2.343	5	16
Ln BSIZE	2.206	2.197	0.255	1.609	2.773
SOPFOR*Ln BSIZE	2.023	2.076	0.359	0.502	2.753
INDDIR	0.790	0.833	0.123	0.400	0.933
SOPFOR*INDDIR	0.73	0.76	0.15	0.12	0.93
CCI	0.43	0.42	0.13	0.20	0.83
SOPFOR*CCI	0.40	0.38	0.13	0.07	0.83
ACI	0.44	0.43	0.11	0.22	0.80
SOPFOR*ACI	0.40	0.39	0.12	0.07	0.80
OWNCON top 10	0.28	0.27	0.13	0.03	0.68
SOPFOR*OWNCON	0.26	0.24	0.12	0.01	0.68
Ln TA	22.01	21.87	1.73	18.59	27.21
TA (million)	21,800	3140	79,200	117,000	657,000
M/B	1.416	0.246	2.496	−0.548	14.981
SR	0.157	0.116	0.369	−0.592	1.711
SV	0.320	0.295	0.120	0.142	0.700
CAPEX	0.046	0.030	0.052	0	0.283
LEV	0.131	0.077	0.147	0	0.684
GDP growth	0.022	0.022	0.005	0.009	0.036

Note: The table reports the summary statistics for all variables. **Dependent variable**: ***pay ratio*** *computed as the log ratio of CEO total pay to the median workers' salaries in a given country*. **Independent variable**: ***SOPFOR*** *(calculated as the number of votes for executive compensation divided by total votes for and against CEO pay)*. **Personal traits**: ***Ln CEO age*** *(the natural log of CEO's age in years)*, ***SOPFOR*Ln CEO age*** *(interaction variable between SOPFOR and Ln CEO age)*, ***Gender*** *(CEO gender is a dummy that assumes the value 1 if the CEO is a female and zero otherwise*, ***SOPFOR*Gender*** *(interaction variable between SOPFOR and Gender)*. **Governance mechanisms**: ***CEO duality*** *(coded one if the chair and the CEO are the same person and zero otherwise)*, ***SOP FOR*CEO duality*** *(interaction variable between SOP FOR and CEO duality)*, ***CPS*** *(CEO pay slice, measured by the percent of total annual compensation of the three to five highest-paid managers claimed by the CEO)*, ***SOPFOR*CPS*** *(interaction variable between SOPFOR and CPS).*; ***Ln BSIZE*** *(the natural log of board size)*, ***SOPFOR*Ln BSIZE*** *(interaction variable between SOP FOR and Ln board size)*. ***INDDIR*** *(independent directors)*, ***SOPFOR*INDDIR*** *(interaction variable between SOP FOR and independent director)*, ***CCI*** *(compensation committee independence)*, ***SOPFOR*CCI*** *(interaction variable between SOPFOR and CCI))*, ***ACI*** *(Audit committee independence)*, ***SOPFOR*ACI*** *(interaction variable between SOPFOR and ACI)*, ***OWNCON*** *(ownership concentration top 10)*, *and* ***SOPFOR*OWNCON*** *(interaction variable between SOPFOR and OWNCON)*. **Firm financial characteristics**: ***TA*** *(total assets, which is the natural logarithm of the total of all short and long-term assets)*, ***M/B*** *(market to book ratio)*, ***SR*** *(stock return)*, ***SV*** *(stock volatility)*, ***CAPEX*** *(capital expenditure ratio) and* ***LEV*** *(leverage)*. **Macroeconomic environment**: ***GDP growth*** *(Annual GDP growth rate).*

Lel (2016) and Balsam et al. (2016). Table 3 also reveals that the average market to book ratio (M/B, 1.416) is much lower than that in Balsam et al. (2016) (2.824). The mean stock return (15.7%) is higher than those in Alissa (2015) and Balsam et al. (2016) which were respectively 14% and 12.6%. Furthermore, the stock volatility as a firm risk proxy had an average of 32%. The mean capital expenditure ratio, the amount invested in fixed assets, was 4.6%, lower than those in Bebchuk et al. (2011) and Correa and Lel (2016) but closed to that in Brunarski et al. (2015). In addition, the mean leverage of the current sample (13%) is lower than that in Bebchuk et al. (2011) but close to that in Correa and Lel (2016). On the macroeconomic environment side, the average growth rate of the four countries was 2.2% in the sampling periods, lower than the 2.73% in Correa and Lel (2016).

4.2 | The IV–GMM coefficient estimates

According to Gujarati and Porter (2010, p. 254), multicollinearity may impact the regression analysis if the degree of correlation between two explanatory variables exceeds 80%. Un-tabulated results show that the highest sample correlation coefficient is less than the recommended threshold of 80%. In addition, this study applies the Variance Inflation Factor (VIF) and tolerance tests for all variables. O'Brien (2007) suggests that a VIF of more than 10 and tolerance of less than 0.10 indicate a problem of multicollinearity. VIF and tolerance tests are conducted when running the OLS estimation which shows that multicollinearity is not a cause for concern.

The outcomes of the IV-GMM estimation for model 1 to 5 are reported in Table 4. Panels A–D correspond respectively to model 1–4. In panel E–H, we test four different versions of model 5 that include the moderating effects of different sets of CGMs: E includes only that of CEO power as measured by CEO duality and CPS; F or G those of the rest of CGMs and either CEO duality or CPS as a measure of CEO power; H includes all the moderating effects tested in panels A–G. Below we will give a brief account of the results for each model, following the logic of the hypothesis development. As it turns out, the outcome of Panel G has the largest Wald statistic and the lowest root mean squared error (RMSE), suggesting that it offers the best fit to data among the tested models.

As anticipated, support for executive pay (SOPFOR) is negatively associated with pay ratio in each panel. These estimates are statistically significant at 1% in all our estimated models. The results are in line with those of Boone et al. (2020) and Crawford et al. (2020), who conclude that negative SOP voting outcome is higher when pay ratio is larger. Thus, *Hypothesis 1* "*Higher pay ratio is associated with lower SOP support for executive compensation*" cannot be rejected, suggesting that SOP rule, regardless of their forms, is successful in constraining the pay gap between the CEOs and the respective median employees in the sampled countries.

Panel A is the baseline model (Equation (1)) which tests the effect of say-on-pay votes (denoted in the model as SOPFOR) without taking account of CEO personal traits and the moderating effect of CGMs on SOPFOR. Panels B and C, respectively, display results correspond to Equations (2) and (3), both having the same set of control variables as those used in Equation (1). These two equations respectively test the effect of CEO age and CEO gender and their moderating effect on the effectiveness of SOP. The coefficient of *Ln CEO age* is negative and significant at 1%, indicating that older CEOs are associated with lower pay ratios. This coefficient remained negative and significant in the four variants of Equation (5) presented in panels E–H. This is in contrast to Adhikari et al. (2015) who find a positive link between CEO age and CEO total pay among the US firms. The interaction term between SOPFOR and Ln CEO age is insignificant at all levels of significance in panels E, F, and H. This observation changes in panels B and G, with G displaying the model with the lowest RMSE. Thus, we cautiously conclude that *Hypothesis 2a* "*The presence of an older CEO increases the effectiveness of SOP in curtailing pay ratio*" cannot be rejected.

In contrast, the coefficient of CEO gender is insignificant in each estimated equation where it is included an explanatory variable, showing that gender and pay ratio are not correlated. This result is consistent with the study of Bugeja et al. (2012) who concluded (based on a US sample) that "women who rise through the 'glass ceiling' to the level of CEO are remunerated at similar levels to their male counterparts." While estimates in panel C, E, and H suggest that the presence of a female CEO increases the effectiveness of SOP in curtailing pay ratio, as the interaction term between SOPFOR and Gender has a negative and significant coefficient, it is insignificant in Panel F and G where the moderating effects of extra CGMs are also accounted for. Given the mixed evidences, we cannot reject *Hypothesis 2b* "*The presence of a female CEO increases the effectiveness of SOP in curtailing pay ratio*" with full confidence.

Panel D correspond to Equation (4) which tests the moderating effect of CGMs only, while E-H tally with Equation (5) which include that of both CEO personal traits and CGMs, with some variations in the set of CGMs included. For example, Panel E considers only CEO power as an internal CGM that moderates the effectiveness of SOP, while Panel F and G include the moderating

TABLE 4 Corporate governance mechanisms, CEO personal traits, and the effectiveness of say-on-pay in curtailing CEO pay ratio. Panels A–D correspond respectively to model 1–4. In panel E-H, we test different versions of model 5 that include the moderating effects of different sets of CGMs: 5a includes only that of CEO power (CEO duality and CPS); 5b or 5c those of the rest CGMs but with only either CEO duality or CPS as a measure of CEO power; 5d includes all the moderating effects tested in panel A–G

Variable/Model	Panel A 1	Panel B 2	Panel C 3	Panel D 4	Panel E 5a	Panel F 5b	Panel G 5c	Panel H 5d
SOPFOR	−0.594***	−0.591***	−0.571***	−0.608***	−0.559***	−1.024***	−0.623***	−0.578***
	(−0.145)	*(−0.14)*	*(−0.148)*	*(−0.154)*	*(−0.159)*	*(0.144)*	*(0.153)*	*(−0.16)*
Ln CEO age		−0.247***			−0.231***	−0.319***	−0.188**	−0.233***
		(−0.088)			*(−0.089)*	*(0.105)*	*(0.090)*	*(−0.089)*
SOPFOR*Ln CEO age		−0.016**			−0.013	−0.002	−0.013*	−0.012
		(−0.008)			*(−0.008)*	*(0.010)*	*(0.008)*	*(−0.008)*
Gender			−0.0521		0.004	0.015	−0.047	0.001
			(−0.051)		*(−0.049)*	*(0.053)*	*(0.046)*	*(−0.049)*
SOPFOR*Gender			−0.108**		−0.110**	−0.118	−0.073	−0.093*
			(−0.053)		*(−0.051)*	*(0.072)*	*(0.055)*	*(−0.055)*
Ln BSIZE	−1.233**	−1.209**	−1.230**	−1.230**	−1.218**	−1.290**	−0.989**	−1.224**
	(−0.518)	*(−0.505)*	*(−0.516)*	*(−0.511)*	*(−0.511)*	*(0.568)*	*(0.453)*	*(−0.512)*
SOPFOR*Ln BSIZE				−0.002		−0.006	0.002	−0.002
				(−0.011)		*(0.013)*	*(0.009)*	*(−0.011)*
INDDIR	−0.271	−0.18	−0.159	−0.267	−0.279	0.242	−0.372*	−0.278
	(−0.208)	*(−0.190)*	*(−0.187)*	*(−0.202)*	*(−0.205)*	*(0.241)*	*(0.214)*	*(−0.205)*
SOPFOR*INDDIR				0.008		0.009	0.015	0.006
				(−0.010)		*(0.012)*	*(0.010)*	*(−0.010)*
CEO duality	−0.022	−0.0123	−0.0283	−0.020	−0.005	−0.024		−0.003
	(−0.037)	*(−0.036)*	*(−0.038)*	*(−0.037)*	*(−0.035)*	*(0.039)*		*(−0.035)*
SOPFOR*CEO duality				−0.018**	−0.013	−0.032***		−0.016*
				(−0.008)	*(−0.008)*	*(0.009)*		*(−0.008)*
CPS	2.945***	2.932***	2.915***	2.937***	2.971***		2.702***	2.965***
	(−0.105)	*(−0.097)*	*(−0.098)*	*(−0.101)*	*(−0.099)*		*(0.080)*	*(−0.099)*
SOPFOR*CPS				0.005	0.007		−0.004	0.007
				(−0.010)	*(−0.010)*		*(0.009)*	*(−0.010)*
CCI	−0.12	−0.136	−0.129	−0.129	−0.114	0.057	−0.097	−0.126
	(−0.106)	*(−0.104)*	*(−0.105)*	*(−0.105)*	*(−0.105)*	*(0.109)*	*(0.096)*	*(−0.105)*
SOPFOR*CCI				−0.010		−0.014	−0.011	−0.011
				(−0.013)		*(0.016)*	*(0.012)*	*(−0.013)*
ACI	−0.346***	−0.302***	−0.320***	−0.341***	−0.329***	−0.348***	−0.198*	−0.323***
	(−0.122)	*(−0.116)*	*(−0.118)*	*(−0.122)*	*(−0.120)*	*(0.125)*	*(0.106)*	*(−0.121)*
SOPFOR*ACI				0.022*		0.024	0.020*	0.021*
				(−0.013)		*(0.015)*	*(0.012)*	*(−0.013)*
OWNCON	0.136	0.105	0.116	0.137	0.145	0.117	0.211	0.143
	(−0.226)	*(−0.216)*	*(−0.220)*	*(−0.222)*	*(−0.224)*	*(0.234)*	*(0.223)*	*(−0.224)*
SOPFOR*OWNCON				−0.014		−0.031***	−0.010	−0.013
				(−0.008)		*(0.011)*	*(0.009)*	*(−0.009)*
Ln TA	0.666***	0.655***	0.660***	0.664***	0.663***	0.659***	0.644***	0.663***
	(−0.133)	*(−0.128)*	*(−0.131)*	*(−0.131)*	*(−0.131)*	*(0.146)*	*(0.122)*	*(−0.131)*

(Continues)

TABLE 4 (Continued)

Variable/Model	Panel A 1	Panel B 2	Panel C 3	Panel D 4	Panel E 5a	Panel F 5b	Panel G 5c	Panel H 5d
M/B	0.0530***	0.045***	0.046***	0.053***	0.052***	0.066***	0.041***	0.052***
	(−0.015)	*(−0.013)*	*(−0.014)*	*(−0.015)*	*(−0.015)*	*(0.017)*	*(0.013)*	*(−0.015)*
SR	0.189***	0.169***	0.167***	0.185***	0.191***	0.191***	0.170***	0.188***
	(−0.036)	*(−0.032)*	*(−0.032)*	*(−0.035)*	*(−0.035)*	*(0.037)*	*(0.030)*	*(−0.035)*
SV	1.188**	0.991**	1.025**	1.183**	1.170**	0.908*	0.698*	1.172**
	(−0.484)	*(−0.437)*	*(−0.450)*	*(−0.478)*	*(−0.475)*	*(0.507)*	*(0.388)*	*(−0.476)*
CAPEX	0.747***	0.686***	0.707***	0.752***	0.793***	0.624***	−0.0246	0.791***
	(−0.167)	*(−0.166)*	*(−0.166)*	*(−0.167)*	*(−0.169)*	*(0.181)*	*(0.217)*	*(−0.169)*
LEV	0.097	0.079	0.059	0.096	0.127	0.124	0.0953	0.122
	(−0.085)	*(−0.086)*	*(−0.088)*	*(−0.085)*	*(−0.085)*	*(0.092)*	*(0.083)*	*(−0.085)*
GDP growth	5.544***	5.037***	4.853***	5.528***	5.636***	4.844**	3.836**	5.649***
	(−1.766)	*(−1.713)*	*(−1.722)*	*(−1.763)*	*(−1.761)*	*(1.923)*	*(1.599)*	*(−1.76)*
Constant	−8.686***	−7.538***	−8.611***	−8.629***	−7.785***	−5.986***	−7.446***	−7.739***
	(−2.002)	*(−1.773)*	*(−1.974)*	*(−1.979)*	*(−1.838)*	*(1.950)*	*(1.628)*	*(−1.841)*
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6773	6749	6769	6773	6749	7094	6749	6749
Wald χ^2	***7824.47***	***8166.07***	***8208.32***	***7895.69***	***7778.37***	***5339.40***	***8473.39***	***7813.83***
Root mean squared error (RMSE)	***0.695***	***0.673***	***0.677***	***0.693***	***0.691***	***0.778***	***0.628***	***0.691***
Hansen $J\ \chi^2$	***0.888***	***0.423***	***0.398***	***0.903***	***0.829***	***0.747***	***0.848***	***0.840***
GMM C statistic χ^2	***0.510***	***0.522***	***0.523***	***0.511***	***0.511***	***0.387***	***0.357***	***0.511***
F-statistic for weak instrument	***8.589*****	***8.818*****	***8.620*****	***8.822*****	***8.681*****	***8.948*****	***8.508*****	***8.662*****

Note: (i) **Dependent variable**: ***pay ratio*** *computed as the log ratio of CEO total pay to the median workers' salaries in a given country*. **Independent variable**: ***SOPFOR*** *(calculated as the number of votes for executive compensation divided by total votes for and against CEO pay)*. **Personal traits**: ***Ln CEO age*** (Natural log of CEO's age in years), ***SOPFOR*Ln CEO age*** *(interaction variable between SOPFOR and Ln CEO age)*, ***Gender*** (CEO gender is a dummy that assumes the value 1 if the CEO is a female and zero otherwise, SOPFOR*Gender (interaction variable between SOPFOR and Gender). **Governance mechanisms**: ***CEO duality*** *(coded one if the chair and the CEO are the same person and zero otherwise)*, ***SOP FOR*CEO duality*** *(interaction variable between SOP FOR and CEO duality)*, ***CPS*** *(CEO pay slice, measured by the percent of total annual compensation of the three to five highest-paid managers claimed by the CEO)*, ***SOPFOR*CPS*** *(interaction variable between SOPFOR and CPS).*; ***Ln BSIZE*** *(the natural log of board size)*, ***SOPFOR*Ln BSIZE*** *(interaction variable between SOP FOR and ln board size)*. ***INDDIR*** *(independent directors)*, ***SOPFOR*INDDIR*** *(interaction variable between SOP FOR and independent director)*, ***CCI*** *(compensation committee independence)*, ***SOPFOR*CCI*** *(interaction variable between SOPFOR and CCI))*, ***ACI*** *(Audit committee independence)*, ***SOPFOR*ACI*** *(interaction variable between SOPFOR and ACI)*, ***OWNCON*** *(ownership concentration top 10)*, *and* ***SOPFOR*OWNCON*** *(interaction variable between SOPFOR and OWNCON)*. **Firm financial characteristics**: ***TA*** *(total assets, which is the natural logarithm of the total of all short and long-term assets)*, ***M/B*** *(market to book ratio)*, ***SR*** *(stock return)*, ***SV*** *(stock volatility)*, ***CAPEX*** *(capital expenditure ratio) and* ***LEV*** *(leverage)*. **Macroeconomic environment**: ***GDP growth*** (Annual GDP growth rate). (ii) *The general method of moments (GMM) method is employed together with the instrumental variables (IVs) chosen from the set explained in Section 4.1. The chosen IVs are those that ensure adequate model specifications in terms of no over-identifying restrictions, no endogeneity, and no weak instruments. The Hansen J statistic is a test of over-identifying restrictions. The Hayashi C statistic is a test for endogeneity. The F-statistic is a test for weak instruments. The fitness of the models is inferred from RMSE and Wald statistic, with the null of the Wald test being that the parameters of interest are jointly equal to zero.*

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

effect of all CGMs, with CEO power alternatively measured by CEO duality in F and by CPS in G.

We observe that, in each model where it is included, CEO duality per se has no significant influence on pay ratio, but its moderating effect on the effectiveness of SOP votes is significant in Panel D, F, and H, but not in E. The negative coefficient of SOPFOR*CEO duality indicates that the curtailing effect of SOP on the pay ratio rises with CEO power. That is, the more powerful the CEO, the more downward pressure the CEO feels on their pay as a consequence of SOP regulation. On the contrary, when measured by CPS (panel D, E, G, H), CEO power is

significantly positively associated with higher pay ratios. The estimated CPS coefficient in Panel G suggests that a one unit of increase in CPS leads to 2.7 units of increase in the pay ratio. Nevertheless, CPS has no moderating effect on the effectiveness of SOP regulation. Therefore, *Hypothesis 3f* "*Higher CEO power reduces the effectiveness of SOP regulation in curtailing pay ratio*" can be rejected whichever measures of CEO power is used.

Table 4 displays a negative effect of board size on pay ratio in all panels at the 5% significance level. This is consistent with the suggestion that larger boards increase effective monitoring and controlling of executives, reducing the possibility of suboptimal pay contract design resulted from powerful executive influences (Bebchuk & Fried, 2003; Salama & Putnam, 2013). Nevertheless, the interactive term between Ln BSIZE and SOPFOR is insignificant in all estimated equations. Thus, *Hypothesis 3a* "*Small board enhances the effectiveness of SOP regulation in curtailing pay ratio*" can be rejected.

Independent directors have a negative and significant impact on pay ratio at 10% in Table 4 Panel G. This is in contrast with Correa and Lel (2016) who report a positive impact of independent directors on CEO pay gap. It is also contrary to the notion that managers may have considerable impact on the choice of outside directors and they may tend to choose directors who are less likely to challenge their pay (Bebchuk et al., 2002). Neither does it agrees with Mollah and Zaman (2015) who suggest that the market for high performing outside directors is limited or outside directors are selected merely to conform with regulatory requirements. Nevertheless, the interaction term SOPFOR*INDDIR is insignificant throughout. Thus, *Hypothesis 3b* "*Independent directors strengthen the effectiveness of SOP regulation in curtailing pay ratio*" can be rejected.

The coefficients of compensation committee (CCI) are statistically insignificant in each model, as are those of the interaction term SOPFOR*CCI. Hence *Hypothesis 3c* "*Compensation committee independence strengthens the effectiveness of SOP regulation in curtailing pay ratio*" can be rejected. Another CGM variable, audit committee independence (ACI) has a negative and significant association with pay ratio in each model, indicating that ACI plays an important role in controlling pay ratio. Its interaction term with SOPFOR is positive and significant at 10% in panel G, suggesting that higher audit committee independence reduces the efficacy of say-on-pay, contrary to intuition. Therefore, the *Hypothesis 3d* "*Audit committee independence strengthens the effectiveness of SOP regulation in curtailing pay ratio*" can be rejected as well.

The effect of ownership concentration on pay ratio is statistically insignificant. This result is contradictory to that of Correa and Lel (2016) and Tosun (2020), who find that large institutional ownership reduces CEO total pay. Nevertheless, ownership concentration holds no one-to-one relation to institutional ownership, as the top owners can be, for example, wealthy individuals instead. The interaction variable (SOPFOR*OWNCON) has a negative and significant impact on pay ratio in panels F, but not in G, albeit G has the lowest MSE. Given the mixed results, we cannot reject *Hypothesis 3e* "*Higher ownership concentration enhances the effectiveness of SOP regulation in curtailing pay ratio*" with full confidence.

All control variables are mostly significant statistically. The signs of those significant coefficient are also consistent with expectations. Among those representing company financial characteristics, firm size, as measured by the natural logarithm of total assets, has a significant and positive coefficient in all panels and with similar magnitude. This is consistent with existing empirical literature. Frydman and Saks (2010) rationalize this phenomenon by arguing that larger companies require more talented managers who are worth more on the job market. In addition, larger companies require more efforts from CEOs and thereby need to reward them more. Salama and Putnam (2013) nevertheless debate that managers tend to expand firm size because size is related to prestige, power, and pay.

Company growth potential, as gauged by M/B, has a significant and positive coefficient at the 1% level in each estimated model. This suggests that managers of growth companies are rewarded more. This finding is in line with Choe et al. (2014) who argue that growth opportunity (as measure by M/B) is a strong predictor of stock-based pay. It can be inferred from Bugeja et al. (2017) that high growth companies are more likely to engage with the pursuit of value increasing opportunities, and their managers are thus rewarded for doing so. Similarly, short-run firm stock performance (SR) has positive and significant coefficient at 1% in all panels, confirming that increasing firm stock performance leads to increased CEO pay. The significant positive sign on short-run stock volatility (SV) in all estimated models suggests that CEOs are rewarded for taking more risks. Lewellyn and Muller-Kahle (2012) argue that the power of executives encourages managers to take risks others would avoid and weaker boards with more powerful executives tend to result in resolutions that largely reflect the executives' desires. As higher risk signals higher returns, the positive coefficient is justifiable. Nonetheless, the current finding is in contrary to that of Correa and Lel (2016).

The link between capital expenditure ratio (CAPEX) and pay ratio is positive and significant at 1% in all panels except for G. Leverage is found to be insignificant in all estimated models. Such finding is not in line with Correa and Lel (2016) who report a negative relationship between pay gap and leverage. However, Henry (2008) reports that the sign of the leverage variable is probably

ambiguous as a positive association might signal value related to an efficient debt usage or the solution of agency problems, while a negative sign would be consistent with the growing capital cost and financial distress arguments. Our results, in light of the early literature, cautiously suggest that the relationship between LEV and pay ratio is likely to be nonlinear.

The macroeconomic environment, as indicated by GDP growth, has a large positive and significant effect on pay ratio at 1% in all panels, suggesting that the pay gap is wider in economies with higher growth rate. The coefficient in Panel G implies that a one unit rise in GDP growth rate leads to 3.8 unit of increase in the pay ratio. Finally, Tables 4 also displays the results of validity test and weak instrument test. As can be seen, Hansen *J* and Hayashi *C* tests respectively show that there is no over-identification and endogeneity issue, with *p*-values larger than 0.10. Furthermore, the *F* test of first-stage regression is statistically significant at 1% and thus our instrumental variables are not weak.

4.3 | Robustness check test

To check the robustness of our results, we conduct an additional analysis by employing limited information maximum likelihood (LIML) estimator. LIML estimator was originally pioneered by Anderson and Rubin (1949, 1950) for the classical simultaneous equation problem (Akashi & Kunitomo, 2012). Bascle (2008) reports that the advantage of LIML estimator is that (i) it has an unbiased median: the median of its sampling distribution is generally close to the population parameter; (ii) LIML is unbiased in the presence of weak instruments, and (iii) it is more efficient than the 2SLS estimator when there are many instrumental variables (Bascle, 2008; Wansbeek & Prak, 2017). After running LIML estimation, we proceed to check the validity of the instruments by using Andersen–Rubin (AR) test for the over-identifying restrictions. A significant test statistic would indicate either an invalid instrument or an incorrectly specified structural equation. In addition, the *F*-statistic has a *p*-value which is less than 0.10, indicating that the instruments are not weak, consistent with the outcome of the minimum eigenvalue statistic test. Our robustness test shows that the instruments are valid and strong. The LIML estimates reported in Table 5 also have coefficients similar to those in Table 4.

5 | DISCUSSION AND CONCLUSION

The current research is motivated by changes in recent say-on-pay regulations, such as the two-strike rule adopted in Australia, the mandatory and binding votes approved in the UK, and a new regulation called Pay Ratio Disclosure introduced in the UK and the US. Our results show that pay ratio is negatively associated with shareholder support, regardless of the forms of SOP regulation embraced by the respective countries. This suggests that shareholder voice is an effective corporate governance mechanism for mitigating the excessive pay gap between CEOs and the median employee, hence achieving its purposes to certain extent. The empirical results are based on unbalanced pooled panel regression models and IV-GMM estimator.

There are three major departures of the current study from the earlier ones. The first is the employment of a different indicator of CEO pay excessiveness, justified by the pay ratio disclosure rule recently implemented in the UK and the USA (see Section 1). The second is the investigation of the moderating effects of the various corporate governance mechanisms on the efficacy of say-on-pay, through the lens of power distribution. While the prior empirical literature (e.g., Crawford et al., 2020; Norman et al., 2020) has considered the direct impact of certain corporate governance mechanisms on CEO pay, the moderating effect of such mechanisms on SOP were missing (see Section 2.3). Another major departure of the current study is to investigate the impact of CEO personal characteristics on pay ratio as well as their moderating effects on the potency of say-on-pay.

We argued in the Introduction that the controversial findings of earlier studies on the effectiveness of SOP may in part be explained by missing explanatory variables. This is partially confirmed in our empirical estimations as we find that the estimated coefficient of SOPFOR changes little when the usual CGM variables are excluded or included but drops noticeably when a variable representing CEO power (CPS) is accounted for, suggesting that estimation bias can be severe when important explanatory variables are missing from the model even with the most appropriate estimation procedures. It is also worth noting that the inclusion of CEO power, when measured by CPS, reduces the RMSE of the empirical model considerably, as opposed to CEO duality. CPS is positively associated with pay ratio, consistent with the notion that more powerful CEOs have a greater capacity to extract rents and to gain excessive pay (Bebchuk et al., 2002). Yet, it neither enhances nor diminishes the effectiveness of SOP. In contrast, although CEO duality (alternative measure of CEO power) has no direct influence on the pay ratio, it has an indirect impact on the ratio through its moderating effect on SOP, suggesting that boards with chairpersons who are also the CEOs of the associated companies are more likely to yield to the pressure of shareholder voices.

TABLE 5 Corporate governance mechanisms, CEO personal traits, and the effectiveness of say-on-pay in curtailing CEO pay ratio (robustness test)

Variable/Model	Panel A 1	Panel B 2	Panel C 3	Panel D 4	Panel E 5a	Panel F 5b	Panel G 5c	Panel H 5d
SOPFOR	−0.595***	−0.588***	−0.567***	−0.610***	−0.561***	−1.000***	−0.599***	−0.580***
	(−0.146)	(−0.144)	(−0.154)	(−0.154)	(−0.160)	(0.152)	(0.163)	(−0.160)
Ln CEO age		−0.249***			−0.230***	−0.332***	−0.199**	−0.233***
		(−0.089)			(−0.089)	(0.109)	(0.094)	(−0.089)
SOPFOR*Ln CEO age		−0.0159**			−0.013	−0.002	−0.013*	−0.012
		(−0.008)			(−0.008)	(0.010)	(0.008)	(−0.008)
Gender			−0.054		0.004	0.011	−0.050	0.001
			(−0.052)		(−0.049)	(0.055)	(0.047)	(−0.049)
SOPFOR*Gender			−0.109**		−0.110**	−0.122*	−0.076	−0.093
			(−0.053)		(−0.051)	(0.074)	(0.056)	(−0.055)
Ln BSIZE	−1.230**	−1.227**	−1.254**	−1.227**	−1.213**	−1.391**	−1.065**	−1.219**
	(−0.520)	(−0.524)	(−0.538)	(−0.512)	(−0.513)	(0.606)	(0.486)	(−0.514)
SOPFOR*Ln BSIZE				−0.002		−0.006	0.002	−0.002
				(−0.011)		(0.013)	(0.009)	(−0.011)
INDDIR	−0.269	−0.180	−0.160	−0.265	−0.276	0.202	−0.410*	−0.275
	(−0.209)	(−0.196)	(−0.194)	(−0.203)	(−0.206)	(0.256)	(0.229)	(−0.206)
SOPFOR*INDDIR				0.008		0.009	0.015	0.006
				(−0.010)		(0.012)	(0.011)	(−0.010)
CEO duality	−0.0216	−0.013	−0.029	−0.020	−0.005	−0.029		−0.003
	(−0.037)	(−0.037)	(−0.040)	(−0.037)	(−0.035)	(0.042)		(−0.035)
SOPFOR*CEO duality				−0.018**	−0.013	−0.032***		−0.016
				(−0.008)	(−0.008)	(0.009)		(−0.008)
CPS	2.944***	2.932***	2.916***	2.936***	2.970***		2.707***	2.964***
	(−0.105)	(−0.098)	(−0.100)	(−0.101)	(−0.099)		(0.082)	(−0.100)
SOPFOR*CPS				0.005	0.007		−0.005	0.007
				(−0.010)	(−0.010)		(0.010)	(−0.010)
CCI	−0.12	−0.14	−0.134	−0.129	−0.115	0.059	−0.096	−0.127
	(−0.105)	(−0.105)	(−0.106)	(−0.105)	(−0.105)	(0.112)	(0.098)	(−0.105)
SOPFOR*CCI				−0.010		−0.014	−0.011	−0.011
				(−0.013)		(0.016)	(0.012)	(−0.013)
ACI	−0.346***	−0.303***	−0.322***	−0.341***	−0.328***	−0.361***	−0.207*	−0.322***
	(−0.122)	(−0.117)	(−0.120)	(−0.122)	(−0.120)	(0.129)	(0.110)	(−0.121)
SOPFOR*ACI				0.022*		0.023	0.019	0.021*
				(−0.013)		(0.015)	(0.012)	(−0.013)
OWNCON	0.134	0.114	0.127	0.136	0.143	0.155	0.245	0.142
	(−0.226)	(−0.223)	(−0.228)	(−0.222)	(−0.224)	(0.248)	(0.238)	(−0.224)
SOPFOR*OWNCON				−0.014		−0.031***	−0.009	−0.013
				(−0.008)		(0.012)	(0.009)	(−0.009)
Ln TA	0.665***	0.659***	0.665***	0.663***	0.662***	0.685***	0.665***	0.662***
	(−0.133)	(−0.133)	(−0.137)	(−0.131)	(−0.132)	(0.156)	(0.131)	(−0.132)
M/B	0.0528***	0.0457***	0.047***	0.053***	0.052***	0.068***	0.042***	0.0518***
	(−0.015)	(−0.014)	(−0.014)	(−0.015)	(−0.015)	(0.018)	(0.013)	(−0.015)

(Continues)

TABLE 5 (Continued)

Variable/Model	Panel A 1	Panel B 2	Panel C 3	Panel D 4	Panel E 5a	Panel F 5b	Panel G 5c	Panel H 5d
SR	0.189***	0.170***	0.168***	0.185***	0.191***	0.194***	0.173***	0.188***
	(−0.036)	(−0.032)	(−0.033)	(−0.035)	(−0.035)	(0.038)	(0.032)	(−0.035)
SV	1.184**	1.003**	1.042**	1.180**	1.165**	0.999*	0.763*	1.167**
	(−0.486)	(−0.453)	(−0.469)	(−0.479)	(−0.477)	(0.540)	(0.416)	(−0.477)
CAPEX	0.749***	0.694***	0.715***	0.754***	0.796***	0.608***	−0.057	0.794***
	(−0.168)	(−0.169)	(−0.169)	(−0.167)	(−0.170)	(0.186)	(0.228)	(−0.169)
LEV	0.0965	0.076	0.056	0.096	0.126	0.119	0.093	0.121
	(−0.085)	(−0.087)	(−0.090)	(−0.085)	(−0.084)	(0.095)	(0.085)	(−0.084)
GDP growth	5.547***	5.047***	4.864***	5.531***	5.640***	4.852**	3.802**	5.652***
	(−1.764)	(−1.721)	(−1.732)	(−1.762)	(−1.759)	(1.969)	(1.635)	(−1.758)
Constant	−8.670***	−7.591***	−8.693***	−8.615***	−7.766***	−6.317***	−7.716***	−7.721***
	(−2.007)	(−1.840)	(−2.061)	(−1.984)	(−1.845)	(2.076)	(1.743)	(−1.847)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6773	6749	6769	6773	6749	7094	6749	6749
Wald χ^2	**6840.01**	**7127.19**	**7076.71**	**6921.95**	**6860.39**	**4412.04**	**7946.95**	**6886.68**
Root mean squared error (RMSE)	**0.694**	**0.676**	**0.681**	**0.692**	**0.690**	**0.796**	**0.642**	**0.689**
Anderson-Rubin χ^2	**0.892**	**0.444**	**0.420**	**0.906**	**0.835**	**0.405**	**0.376**	**0.846**
F-statistic for weak instrument	**9.173****	**9.421****	**9.268****	**9.426****	**9.252****	**9.632****	**8.918****	**9.250****
Minimum eigenvalue statistic	**9.173**	**9.421**	**9.268**	**9.426**	**9.252**	**9.632**	**8.918**	**9.25**
LIML size of nominal 5%	**8.68**	**8.68**	**8.68**	**8.68**	**8.68**	**8.68**	**8.68**	**8.68**

Note: (i) **Dependent variable**: ***pay ratio*** *computed as the log ratio of CEO total pay to the median workers' salaries in a given country*. **Independent variable**: ***SOPFOR*** *(calculated as the number of votes for executive compensation divided by total votes for and against CEO pay)*. **Personal traits**: ***Ln CEO age*** *(Natural log of CEO's age in years)*, ***SOPFOR*Ln CEO age*** *(interaction variable between SOPFOR and Ln CEO age)*, ***Gender*** *(CEO gender is a dummy that assumes the value 1 if the CEO is a female and zero otherwise, SOPFOR*Gender (interaction variable between SOPFOR and Gender)*. **Governance mechanisms**: ***CEO duality*** *(coded one if the chair and the CEO are the same person and zero otherwise)*, ***SOP FOR*CEO duality*** *(interaction variable between SOP FOR and CEO duality)*, ***CPS*** *(CEO pay slice, measured by the percent of total annual compensation of the three to five highest-paid managers claimed by the CEO)*, ***SOPFOR*CPS*** *(interaction variable between SOPFOR and CPS).*; ***Ln BSIZE*** *(the natural log of board size)*, ***SOPFOR*BSIZE*** *(interaction variable between SOP FOR and Ln board size)*. ***INDDIR*** *(independent directors)*, ***SOPFOR*INDDIR*** *(interaction variable between SOP FOR and independent director)*, ***CCI*** *(compensation committee independence)*, ***SOPFOR*CCI*** *(interaction variable between SOPFOR and CCI))*, ***ACI*** *(Audit committee independence)*, ***SOPFOR*ACI*** *(interaction variable between SOPFOR and ACI)*, ***OWNCON*** *(ownership concentration top 10)*, and ***SOPFOR*OWNCON*** *(interaction variable between SOPFOR and OWNCON)*. **Firm financial characteristics**: ***TA*** *(total assets, which is the natural logarithm of the total of all short and long-term assets)*, ***M/B*** *(market to book ratio)*, ***SR*** *(stock return)*, ***SV*** *(stock volatility)*, ***CAPEX*** *(capital expenditure ratio) and* ***LEV*** *(leverage)*. **Macroeconomic environment**: ***GDP growth*** *(Annual GDP growth rate)*. (ii) *LIML estimator is used as robustness test. The IVs are chosen so that to ensure adequate model specifications in terms of no over-identifying restrictions, no endogeneity, and no weak instruments. Anderson-Rubin statistic checks the validity of instruments. The F-statistic is a test for weak instruments. Minimum eigenvalue statistic tests the null hypothesis of weak instruments, with critical values listed as "LIML size of nominal 5%" (obtained from* Stock & Yogo, 2005*). The fitness of the models is inferred from RMSE and Wald statistic, with the null of the Wald test being that the parameters of interest are jointly equal to zero.*

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Managerial power theory suggests that powerful executive can influence the power distribution within a corporation through for example the appointment of outside directors, which further affect the board dynamics, making it difficult for board members to deal with CEOs in a truly arm's length way, especially when other directors have no interests in confronting the executives over their compensation (Bebchuk et al., 2002). This argument is partly supported in our results, which reveals that board size, independent directors, and audit committee independence all have the desired impact on pay ratio, suggesting the efficacy of these corporate governance

mechanisms. Such impact is nevertheless missing from compensation committee independence. Further, our results suggest that certain CGMs, such as ACI, diminishes the effectiveness of say-on-pay regulation, but most other CGMs have no moderating effect on SOP. The outcome on ownership concentration is mixed across our estimated models. It has no direct impact on the pay ration; but in one model, the coefficient of the interaction term (SOPFOR*OWNCON) is negative and significant, suggesting its modest moderating effect on SOP. Our findings have implications for companies, investors and regulators concerning the importance of power balance structure within corporations.

We find that the coefficient of gender is insignificant in all our estimated model, suggesting that gender has no direct effect on the pay ratio. Nevertheless, our estimates suggest that CEO age is negatively associated with pay ratio. The interaction term between gender/age and SOPFOR is significant in some but not all models, giving mixed evidence on the moderating effect of gender and age on SOP. These are interesting outcomes regarding the role of CEO personal traits, nevertheless the measurements of such traits are too simple. In fact, any attempt to measure personal traits with a few numerals is bound to achieve limited insights. Case studies based on in-depth interviews, combined with objectively measurable financial outcomes, will yield deeper understanding. Furthermore, the insignificance of gender in the estimated model may come from a small sample bias, as only 3.5% of CEOs in our sample are female. This issue can only be resolved when the corporate world catches up with gender equality.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

[1] "The first-strike occurs when a firm's compensation report receives 25% or more negative votes by stockholders at the annual general meeting, and then the board of directors is required to clarify in the subsequent pay report how the owners' concerns regarding the preceding remuneration report were addressed. The second-strike occurs if the pay report of a company receives 25% or more disapproval votes for two consecutive years." In such a case, the board may face re-election except for the CEO (Monem & Ng, 2013).

[2] Bebchuk and Fried (2003) refer to negative reactions by outsiders as "outrage," and to the costs that such reactions impose on managers and directors as "outrage costs."

[3] https://www.sec.gov/news/statement/reconsideration-of-pay-ratio-rule-implementation.html.

[4] For US companies, the missing data of CEO compensation is obtained from SEC filings and for Canadian firms, CEO pay and governance mechanisms are collected from management information circulars.

[5] Stathopoulos and Voulgaris (2016) point out that SOP policy was adopted by Canadian firms in 2012, although the SOP votes policy was recommended by the Canadian Coalition for Good Governance (CCGG) in September 2010. The number of companies that adopted this policy was smaller in 2011 compared to 2012. Thus, 2012 is documented as the year of SOP policy adoption in Canada.

[6] Smaller companies, which have less than $75 million of the market value of common equity, were allowed a two-year delay until 2013 to implement say-on-pay.

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