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The Impact of Say-On-Pay on Firm Efficiency in Anglo-Saxon Economies—Do CEO Personal Traits and CG Mechanisms Matter?

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ABSTRACT

In this study, we explore how the personal traits of CEOs and corporate governance mechanisms moderate the link between say-on-pay (SOP) votes and various aspects of firm efficiency. Our sample consists of 1931 firms listed in four Anglo-Saxon economies (i.e., USA, UK, Canada and Australia) during a period of notable regulatory changes. Our findings reveal a significant and positive impact of SOP votes on firm efficiency. This suggests that company executives recognise that lower efficiency leads to lower pay or even job loss. Interestingly, our analysis indicates that younger managers can contribute more to creating value and improving business performance compared with their older counterparts. However, the relationship between gender and firm efficiency remains inconclusive. Furthermore, our study highlights the limited involvement of the board of directors in driving firm efficiency. This could be attributed to inadequate monitoring, cooperation and communication among board members, particularly in the case of audit committees, which seem to have less skilled members. Alternatively, this lack of board engagement may be due to the influence of powerful managers within the company. This paper also offers practical implications to policy-makers and practitioners and suggests avenues for future research that can build upon our evidence.

1 | Introduction

The corporate governance literature on pay-for-performance has been predominantly shaped by two competing theories: optimal contract theory and managerial power theory. Optimal contract theory posits that executive compensation packages are efficiently negotiated between company boards and senior managers, aligning the interests of executives with those of shareholders. This theory predicts a strong correlation between company performance and executive compensation (Bebchuk and Fried 2003). In contrast, managerial power theory suggests that CEO compensation is often determined by dependent boards under the influence of powerful executives, leading to compensation packages that do not necessarily reflect shareholder interests. As a result, this theory expects a weak or nonexistent correlation between CEO pay and performance, except when executives benefit from "luck" rather than merit (Ntim et al. 2019).

Despite extensive research, empirical evidence has not definitively supported either theory. The debate over excessive executive pay has intensified, particularly in light of scandals such as Enron and WorldCom, the 2008 economic collapse and instances of "pay for failure." These events have heightened shareholder concerns and prompted a re-examination of CEO compensation practices (Jensen and Murphy 1990; Core, Holthausen, and Larcker 1999; Bebchuk, Cremers, and Peyer 2011; Alves, Couto, and Francisco 2016).

In response to these controversies, several countries, including the UK, Australia, the Netherlands, Norway, Sweden and the USA, have introduced say-on-pay (SOP)[1] regulations. These regulations aim to improve corporate governance by enhancing managerial accountability, increasing transparency, encouraging shareholder participation, protecting shareholder rights, curbing excessive CEO pay and discouraging short-term profit-seeking behaviours (Conyon and Sadler 2010; Ferri and Maber 2013). Proponents of SOP argue that it is an effective mechanism for aligning executive compensation with shareholder interests, as shareholders are motivated to support proposals that enhance their wealth. However, critics contend that noninstitutional shareholders may lack the incentives, information and expertise needed to make informed decisions, potentially undermining the effectiveness of SOP (Carter and Zamora 2007).

Cuñat, Giné, and Guadalupe (2016) provide two primary reasons why SOP might improve firm performance. First, if SOP enforces a stricter alignment between pay and performance, executives will have stronger incentives to achieve higher profits. Second, by fostering more active monitoring, the annual SOP vote at the general meeting can serve as a vote of confidence, thereby pressuring managers to deliver better performance or risk losing their positions.

Although there is growing interest in understanding the effectiveness of SOP in promoting pay-for-performance, empirical studies remain limited. Some research suggests that SOP has enabled investors to push for stronger links between executive compensation and company performance (Cuñat, Giné, and Guadalupe 2016; Ferri and Maber 2013). These studies indicate that companies implementing SOP tend to exhibit higher financial performance metrics, such as return on assets (ROA), return on operating assets, return on equity (ROE) and Tobin's *Q* (Ammann, Oesch, and Schmid 2011; Adams and Mehran 2012). However, many earlier studies predominantly focus on accounting-based performance measures, often overlooking other critical factors like the cost of equity capital.

This study aims to address the gaps and limitations of prior research by exploring the impact of SOP votes on firm efficiency using nontraditional performance measures such as return on invested capital (ROIC) and economic profit (EP). These measures are particularly relevant for assessing long-term firm efficiency and their alignment with CEO compensation. The current study also seeks to examine the role of CEO personal traits and corporate governance mechanisms (CGMs) in influencing the relationship between SOP votes and firm efficiency. By doing so, the research aims to provide deeper insights into how these factors contribute to effective governance, leadership selection and overall firm performance. Exploring the influence of CEO traits and CGMs on the relationship between SOP votes and firm efficiency is crucial for several reasons. CEO characteristics like age, gender and risk tolerance significantly impact decision-making and leadership styles, affecting SOP's effectiveness (Custódio and Metzger 2014). Additionally, strong governance structures enhance SOP's ability to align pay with performance, whereas weak governance can dilute its impact (Bebchuk and Fried 2003). Addressing the underexplored moderating effects of these factors advances both academic understanding and practical governance reforms (Cuñat, Giné, and Guadalupe 2016).

The theoretical motivation for this study stems from the ongoing debate between optimal contract theory and managerial power theory, particularly in the context of emerging SOP regulations. These two theories offer contrasting perspectives on the relationship between SOP and firm efficiency, with optimal contract theory highlighting SOP's potential to enhance efficiency by aligning executive incentives with shareholder interests, whereas managerial power theory emphasises the challenges posed by boards that may lack the ability or willingness to resist managerial influence. To bridge these differing viewpoints, it is essential to examine the role of CGMs that can either strengthen or weaken the impact of SOP. This study seeks to fill this gap by analysing how various corporate governance structures interact with SOP votes to affect firm efficiency, drawing on an integrated theoretical approach that encompasses both optimal contract and managerial power theories. On the empirical side, the research is driven by the need to incorporate long-term performance measures, such as ROIC and EP, which offer a more comprehensive evaluation of firm efficiency compared to traditional accounting metrics. Furthermore, the study explores the moderating effects of CEO personal traits and CGMs on the SOP-efficiency relationship, a relatively underexplored area in the existing literature.

This study is based on a sample of 1931 publicly listed companies across four Anglo-Saxon economies[2]: Australia, Canada, the UK and the USA. These countries were selected for several reasons. First, they have adopted different types of SOP regulations, offering a diverse regulatory landscape for analysis. Second, these countries operate under a unitary board system (one-tier), which facilitates comparative analysis. Third, they share a common law system, which provides strong shareholder protections (Weimer and Pape 1999). At last, the corporate governance systems in these countries are characterised by dispersed equity holdings and significant delegation of corporate responsibilities to management (Cernat 2004; García-Sánchez, Rodríguez-Domínguez, and Frías-Aceituno 2015).

Although these countries share many similarities, there are also important differences. For example, the UK and the USA have issued the highest number of governance codes (Cuomo, Mallin, and Zattoni 2016), and the size of their markets differs significantly, with the US market being the largest. Additionally, the legislative approaches to corporate governance vary, with the USA's Sarbanes-Oxley Act (SOA) prescribing a uniform set of practices, whereas other countries, like the UK, follow a "comply or explain" approach, allowing companies to either adopt regulator-endorsed best practices or explain their alternative strategies (Luo and Salterio 2014; Joura et al. 2023). By investigating these contexts, this study aims to provide comprehensive insights into the effectiveness of SOP in different regulatory environments and its implications for corporate governance practices.

Our empirical findings report a positive influence of SOP on different dimensions of firm efficiency measures, including economic, business and market measures. This suggests that executives perceive lower firm efficiency as a risk to their pay and positions. The

study also reveals that younger CEOs are more capable of creating firm value and business compared with older CEOs, and the impact of gender on firm efficiency is unclear. Additionally, the research indicates that firms' board members are relatively less active, potentially due to communication and monitoring issues and the influence of managerial power, which reduces firm efficiency.

This paper makes several key contributions to the existing literature. First, this study investigates the impact of SOP votes on firm efficiency by employing nontraditional measures, namely ROIC and EP. This approach differs from prior studies, such as those by Correa and Lel (2016), which primarily used SOP regulations as independent variables and Tobin's *Q* as a dependent variable. Second, the research reveals the significant effects of CEO personal traits on the efficacy of SOP votes. This is a novel approach in the SOP literature, providing new insights into the role of leadership characteristics in shaping firm efficiency outcomes. Third, the study explores the moderating effects of various CGMs on the efficacy of SOP. It scrutinises power distribution dynamics, offering a more thorough understanding of how these mechanisms influence the relationship between SOP votes and firm performance. This contrasts with prior empirical literature, which typically included these mechanisms as control variables only. Fourth, to mitigate the endogeneity problem, which can lead to biased and inconsistent results, this paper adopts the instrumental variables-generalised method of moments (IV-GMM) estimator. This methodological approach enhances the robustness of the findings and represents a significant advancement over the techniques employed in previous studies.

The remainder of this paper is organised as follows. Section 2 contains a literature review and hypotheses development. Methodology and sample selection are discussed in Section 3. Section 3.5 reports regression results. Section 4 concludes the paper.

2 | Literature Review, Theoretical Framework and Hypothesis Development

2.1 | Theoretical Framework

The relationship between shareholders and CEOs is a central concern in corporate governance studies, primarily explored through the lens of agency theory. Originally articulated by Jensen and Meckling (1976), agency theory addresses the conflicts inherent in the principal-agent relationship, where shareholders (principals) delegate decision-making authority to company executives (agents) who manage the firm on their behalf. This delegation of authority often leads to a misalignment of interests, as the agents' decisions impact the company, but the associated risks and rewards are borne by the principals. Consequently, agents might not always act in the best interest of the principals, leading to what is known as agency problems or agency costs.

One regulatory mechanism introduced to mitigate these agency problems is SOP, which allows shareholders to have a direct voice in approving executive compensation packages. This mechanism is seen as a tool to align the interests of executives more closely with those of shareholders by ensuring that compensation structures incentivise executives to pursue strategies that maximise shareholder value. Cuñat, Giné, and Guadalupe (2016) argue that SOP plays a crucial role in reducing agency costs, as it empowers shareholders to influence executive pay packages, thereby encouraging decisions that enhance long-term firm performance rather than short-term gains that may not be sustainable.

The effectiveness of SOP in reducing agency problems and improving firm efficiency can be better understood through the dual lenses of optimal contract theory and managerial power theory—both of which extend the basic premises of agency theory. Optimal contract theory posits that executive compensation packages result from efficient negotiations between well-functioning boards and senior managers. According to this theory, compensation packages are designed to align the interests of executives with those of shareholders by linking pay to firm performance (Bebchuk and Fried 2003). The theory predicts that effective boards will negotiate contracts that provide executives with incentives to maximise shareholder value, thereby enhancing firm efficiency.

From the perspective of optimal contract theory, SOP serves as an additional governance tool that reinforces the alignment between executive compensation and firm performance. By requiring shareholder approval of executive pay packages, SOP ensures that compensation structures not only are optimally designed but also reflect shareholders' preferences and interests. This mechanism helps mitigate agency problems by ensuring that executives are rewarded for performance outcomes that genuinely enhance firm value, promoting long-term firm efficiency (Jensen and Meckling 1976; Holmstrom 1983). Empirical evidence supports the predictions of optimal contract theory. Studies demonstrate that firms with robust SOP mechanisms tend to exhibit a stronger alignment between pay and performance. For example, research by Cuñat, Giné, and Guadalupe (2016) and Ferri and Maber (2013) shows that in companies where SOP has been effectively implemented, there is a stronger correlation between executive pay and firm performance metrics such as ROE and return on assets. These findings suggest that SOP enhances firm efficiency by ensuring that executive incentives are closely tied to the achievement of long-term performance goals.

In contrast, managerial power theory offers a more critical perspective on the relationship between executive compensation and firm efficiency. This theory argues that CEO compensation often results from negotiations between dependent boards and powerful executives who use their influence to secure pay packages that serve their own interests rather than those of the shareholders. Consequently, managerial power theory predicts a weaker or nonexistent correlation between pay and firm performance, as compensation may be based on factors unrelated to the executives' actual contributions to the company (Bebchuk and Fried 2003; Ntim et al. 2019).

Managerial power theory also suggests that SOP alone may not be sufficient to correct these imbalances, particularly in firms where boards are heavily influenced by management. In such cases, SOP votes may be more symbolic than substantive, failing to result in meaningful changes to executive compensation practices. Studies support this theory, showing that in companies with

weak governance structures, SOP has had a limited impact on aligning pay with performance, and excessive executive compensation persists despite shareholder opposition (Bebchuk, Cremers, and Peyer 2011). Recent studies further highlight the limitations of SOP in firms where managerial power is entrenched. Research has found that in companies with high levels of managerial entrenchment, SOP votes are less likely to result in changes to executive compensation packages, and the correlation between pay and performance remains weak (Alves, Couto, and Francisco 2016; Adams and Ferreira 2007). These findings underscore the importance of considering the broader governance context when evaluating the effectiveness of SOP in improving firm efficiency.

The contrasting predictions of optimal contract theory and managerial power theory provide a comprehensive framework for understanding the relationship between SOP and firm efficiency. Although optimal contract theory highlights the potential for SOP to enhance firm efficiency by aligning executive incentives with shareholder interests, managerial power theory emphasises the challenges that may arise when boards are unable or unwilling to resist managerial influence.

To reconcile these perspectives, it is important to consider the role of CGMs that can either reinforce or undermine the effectiveness of SOP. For instance, the presence of independent directors, the structure of board committees, and the level of shareholder activism are all factors that can influence the extent to which SOP votes translate into meaningful changes in executive compensation practices (Gompers, Ishii, and Metrick 2003; Edmans and Gabaix 2009). Recent research by Sanchez-Marin et al. (2017) indicates that in firms with strong governance frameworks, SOP is more likely to lead to positive outcomes in terms of both executive compensation and firm performance. Studies have found that in companies with a high proportion of independent directors, SOP votes are more effective in aligning pay with performance, resulting in improved firm efficiency (Adams, Hermalin, and Weisbach 2010; Joura, Xiao, and Ullah 2021). Conversely, in firms with weak governance, SOP is less effective, and managerial power can undermine the potential benefits of this governance tool (Joura et al. 2023).

Collectively, the relationship between SOP and firm efficiency can be best understood through an integrated theoretical framework that draws on both agency theory and its extensions—optimal contract theory and managerial power theory. Although SOP has the potential to enhance firm efficiency by aligning executive incentives with shareholder interests, its effectiveness is contingent on the broader corporate governance context. By considering the interplay between SOP, executive compensation and firm efficiency, this study aims to contribute to the ongoing debate in the corporate governance literature and provide insights into how SOP can be leveraged to promote better governance practices and improve firm performance.

2.2 | Previous Studies

Empirical research on the relationship between CEO compensation and firm performance has produced mixed findings. For example, Jensen and Murphy (1990) identified a positive correlation between CEO wealth and shareholder wealth in a sample of U.S. firms, suggesting that aligning executive compensation with shareholder interests can enhance firm value. Similarly, Hubbard and Palia (1995) observed a strong pay-performance relationship in deregulated banking markets, indicating that competitive environments may strengthen this link. In contrast, Firth, Fung, and Rui (2006) found a positive association between executive compensation and company performance in Chinese listed firms, but this relationship weakened in companies where a state agency held a majority stake, suggesting that ownership structure plays a significant role in moderating the pay-performance relationship.

Other studies have examined the impact of specific components of CEO pay on firm performance. For instance, Bebchuk, Cremers, and Peyer (2011) discovered a negative relationship between the CEO pay slice (CPS)—the proportion of total executive compensation allocated to the CEO—and firm value, indicating that disproportionate CEO pay relative to other executives is linked to poorer firm performance. Additionally, Forbes, Pogue, and Hodgkinson (2016) explored the effects of inequality in executive pay awards, finding that its impact on firm performance varies depending on the size of the board, suggesting that governance structures can influence the effectiveness of compensation policies.

The introduction of SOP regulations, which grant shareholders the right to vote on executive compensation at annual general meetings (AGMs), has generated significant academic interest. Studies examining the impact of SOP on CEO pay and firm performance have produced varied results. Ferri and Maber (2013) found that investors used SOP to pressure companies into more closely aligning executive compensation with performance outcomes. Cuñat, Giné, and Guadalupe (2016) employed regression discontinuity analysis to show that firms adopting SOP experienced improvements in key performance indicators, such as ROA, return on operating assets, Tobin's *Q* and ROE, highlighting the potential benefits of SOP in enhancing firm performance. Correa and Lel (2016) also reported a stronger link between executive compensation and firm performance in countries with SOP regulations, suggesting that these regulations may improve accountability and alignment between pay and performance.

Overall, the existing literature reveals a lack of consensus on the relationship between CEO compensation and firm performance, as well as the effectiveness of SOP regulations in improving firm outcomes. The limited research on the direct effects of shareholder votes on performance underscores the need for further investigation into how SOP and other governance mechanisms influence the alignment between executive pay and firm success (Ntim et al. 2019). As such, the current study addresses the gap in the existing literature by examining the conditions under which SOP can lead to more efficient performance in Anglo-Saxon firms, taking into account the moderating impact of CEO characteristics and CGMs.

2.3 | Hypothesis Development

2.3.1 | SOP Votes and Firm Efficiency

Corporate efficiency is often defined as a company's ability to maximise output with a given set of inputs (Hanousek, Shamshur, and Tresl 2019). Traditional studies investigating the

relationship between CEO compensation and SOP votes have largely relied on accounting and market-based measures, such as ROA, ROE and Tobin's *Q*, as proxies for firm performance. For instance, Cuñat, Giné, and Guadalupe (2016) used ROA, ROE, Tobin's *Q*, earnings per share (EPS) and labor productivity, whereas Ferri and Maber (2013) focused specifically on ROA in their analysis of the UK market. Tobin's *Q*, in particular, has been a popular metric in empirical research exploring the impact of SOP on firm performance and in studies linking CGMs to overall firm outcomes (Ammann, Oesch, and Schmid 2011; Adams and Mehran 2012).

However, these traditional performance measures have significant limitations. Critics such as Van Clieaf, O'Byrne, and Leeflang (2014) argue that metrics like EPS and total shareholder return (TSR) are inadequate as they fail to consider critical factors like the level of invested capital, the cost of capital, and the future value embedded in a company's valuation. Such measures are often unreliable indicators of firm efficiency or the success of business strategies because they are heavily influenced by external market and industry factors beyond the company's control. Similarly, the Allaire (2012) contends that performance indicators should focus on long-term corporate health rather than short-term stock price-related metrics, advocating instead for the use of ROIC and EP as more accurate gauges of firm efficiency.

Furthermore, Hanousek, Shamshur, and Tresl (2019) suggest that an exclusive reliance on accounting and financial metrics can introduce bias, as firms might engage in unethical practices, such as bribery, to boost performance metrics, whereas those with lower earnings might resort to similar tactics to survive or grow. Given these critiques, alternative performance measures like EP and ROIC offer a more reliable assessment of firm efficiency. For instance, Sirbu (2012) emphasises that EP or Economic Value Added (EVA) aligns management's goals with shareholder interests, enhances accountability and provides a more precise analysis of corporate performance. Parvaei and Farhadi (2013) further argue that EP is the most effective metric for evaluating both corporate and managerial efficiency. Supporting this, recent research by Chen, Jin, and Qin (2023) found that EP (EVA) possesses greater explanatory power for market-adjusted stock returns compared to other accounting-based measures. Thus, this study emphasises the superior ability of SOP to enhance firm efficiency when evaluated through more comprehensive and forward-looking metrics like EP, as opposed to traditional measures like ROA, ROE and Tobin's *Q*, which may not fully capture the true economic performance of the firm (Joura, Xiao, and Ullah 2021). Considering these insights, we propose the following hypothesis:

Hypothesis 1a. *SOP votes have a positive impact on EP (economic profit).*

In line with Allaire (2012) and Van Clieaf, O'Byrne, and Leeflang (2014), ROIC and EP are considered more suitable as long-term performance indicators for determining CEO compensation. Fisch, Palia, and Solomon (2018) found that low shareholder support for CEO pay packages is significantly associated with the issuer's EP, indicating that negative SOP votes often reflect dissatisfaction with corporate performance in terms of EP. Additionally, Qian and Zhu (2018) adopted ROIC as a measure, as it captures managerial efficiency in utilising all of a firm's capital. Farza et al. (2021) also argue that ROIC reflects both shareholder and borrowed capital, making it an important indicator of a company's reinvestment abilities. Based on these discussions, we formulate the following hypothesis:

Hypothesis 1b. *SOP votes have a positive impact on ROIC (business performance).*

Tobin's *Q*, which proxies market expectations about a company's future earnings, is considered less susceptible to the strategic manipulation of earnings and accounting conventions than traditional performance measures like ROA and ROE (Bennouri, et al. 2024). Jermias and Gani (2014) also emphasise that Tobin's *Q* is more objective because it is less influenced by management's control. Conheady et al. (2015) state that Tobin's *Q* measures the market's valuation of the quality of a firm's corporate governance practices, with a higher *Q* suggesting greater effectiveness. Correa and Lel (2016) found that the adoption of SOP rules leads to an increase in firm value as measured by Tobin's *Q*. Therefore, we hypothesise:

Hypothesis 1c. *SOP votes have a positive impact on Tobin's Q (market performance).*

2.3.2 | CEO Personal Traits and Firm Efficiency

Research suggests that CEOs' personal traits, such as age and gender, can significantly influence their strategic decisions, thereby affecting firm efficiency. Wang and Chen (2020) indicate that executives' psychological and observable attributes impact the strategic choices they make, ultimately influencing a firm's overall efficiency. Studies have found that managerial effects can account for 5%–20% of the variance in firm efficiency, with some research suggesting that CEOs can contribute as much as 50% to a firm's performance.

2.3.2.1 | CEO Age as an Indicator of CEO Physiological Characteristics and Firm Efficiency. Age has been linked to the ability to process and analyse information (Hsu, Chen, and Cheng 2013). McKnight et al. (2000) argue that a manager's age reflects their accumulated knowledge, experience and education. Several studies have examined the relationship between CEO age and compensation, with Adhikari et al. (2015) suggesting that older managers receive higher pay to incentivise risk-taking and ethical behaviour. Choe, Tian, and Yin (2014) similarly found that older CEOs tend to receive higher compensation, whereas Dah and Frye (2017) observed that older CEOs are more likely to receive excessive cash compensation. However, Brockman, Lee, and Salas (2016) identified a negative association between CEO age and pay, and McKnight et al. (2000) argued that age has a limited impact on efficiency-related pay. Based on these findings, we propose:

Hypothesis 2a. *The presence of an older CEO increases firm efficiency through the effectiveness of SOP.*

2.3.2.2 | CEO Gender as an Indicator of CEO Social Characteristics and Firm Efficiency. The impact of gender on

corporate financial decisions and firm efficiency has been widely explored. According to Khan and Vieito (2013), men are generally less risk-averse than women, and these differences in risk tolerance can affect corporate financial decisions and efficiency. The relationship between board gender diversity and firm efficiency is often explained by agency theory, resource dependence theory and human capital theory, with female directors believed to bring fresh perspectives and valuable advice to top managers (Bennouri et al. 2018).

However, research on the link between gender diversity and firm efficiency presents mixed findings. For instance, Khan and Vieito (2013) found that companies with female CEOs performed better and had lower risk levels than those led by male CEOs. Conversely, Faccio, Marchica, and Mura (2016) suggested that female CEOs do not allocate capital as efficiently as their male counterparts. Hanousek, Shamshur, and Tresl (2019) also reported lower efficiency in companies managed by female CEOs compared with those led by male CEOs. Given these conflicting results and the lack of consideration for the moderating effect of gender on firm efficiency in the context of SOP, we hypothesise:

Hypothesis 2b. *The presence of a female CEO increases firm efficiency through the effectiveness of SOP.*

2.3.3 | Power Distribution and Firm Efficiency

Bebchuk and Fried (2003) introduce the managerial power approach as a framework for understanding executive compensation. According to this approach, companies with powerful CEOs tend to have higher compensation packages that are less tied to performance or efficiency. Several factors contribute to the concentration of power in CEOs: a weak or ineffective board of directors, the absence of a significant outside shareholder, a smaller number of institutional shareholders and the protection provided by antitakeover arrangements. These factors enable powerful CEOs to exert substantial influence over company policies, regardless of firm performance (Bebchuk and Fried 2003).

2.3.3.1 | Board Size. Board size plays a crucial role in overseeing and evaluating top management to achieve corporate objectives. However, larger boards can become less effective because of the challenges in coordination, communication and information processing among directors (Bebchuk and Fried 2003). Although smaller boards are often preferred for their efficiency, larger boards can offer a stronger advisory role (Huang and Wang 2015). Lipton and Lorsch (1992) suggest that an optimal board size ranges between eight to nine members, where the benefits of increased monitoring outweigh the costs associated with slower decision-making. Despite the importance of board size, prior empirical studies (e.g., Ferri and Maber 2013; Cuñat, Giné, and Guadalupe 2016; Correa and Lel 2016) have not fully explored its impact on firm efficiency post-SOP implementation. Therefore, we hypothesise:

Hypothesis 3a. *A smaller board enhances firm efficiency through the effectiveness of SOP.*

2.3.3.2 | Independent Directors. Independent directors are vital in mitigating agency problems by monitoring and controlling managerial opportunism (Haniffa and Hudaib 2006). Bebchuk, Fried, and Walker (2002) argue that when independent directors lack effectiveness, managerial power dominates decision-making, particularly when directors are appointed by the CEO. Salama and Putnam (2013) emphasise that a higher number of independent directors is crucial for firms pursuing long-term investments, such as global diversification, as these strategies impact shareholder value. Supporting this, Correa and Lel (2016) found that CEO pay growth is higher in firms with more independent directors. Consequently, we hypothesise:

Hypothesis 3b. *Independent directors strengthen firm efficiency through the effectiveness of SOP.*

2.3.3.3 | CEO Power. The managerial power approach posits that CEOs can influence their own compensation without it being linked to company performance (Wang and Chen 2020). Wang and Chen (2020) demonstrate that CEO impact accounts for approximately 5%–20% of the variance in performance. However, Jiraporn, Chintrakarn, and Liu (2012) argue that powerful CEOs exacerbate agency costs and negatively impact firm efficiency, with these firms showing lower CEO turnover, reduced stock return variability and a higher likelihood of unwise decisions. Bebchuk, Cremers, and Peyer (2011) also find that strong CEO dominance is associated with lower firm value, as measured by Tobin's *Q* and weaker accounting profitability. Therefore, we hypothesise:

Hypothesis 3c. *CEO power is less effective in increasing firm efficiency.*

2.3.3.4 | Compensation Committee Independence. The compensation committee plays a critical role in determining CEO pay packages and promoting shareholder value (Thomas 2004). However, the independence of committee members can be compromised by personal ties to the CEO or other conflicts of interest (Conyon 2014). Despite these potential issues, the compensation committee is vital for aligning CEO pay with firm performance and shareholder interests (Salama and Putnam 2013). Based on these considerations, we hypothesise:

Hypothesis 3d. *Compensation committee independence strengthens firm efficiency through the effectiveness of SOP.*

2.3.3.5 | Audit Committee Independence. Audit committees are essential in monitoring the financial reporting process and preventing managerial opportunism, as highlighted by agency theory (Badolato, Donelson, and Ege 2014). These committees help reduce information asymmetry between executives and boards, contributing to better internal corporate control (Chen and Chen 2012). Regulators view audit committees as crucial governance mechanisms for enhancing transparency and, consequently, firm efficiency (Ghafran and O'Sullivan 2013). However, Badolato, Donelson, and Ege (2014) caution that the effectiveness of audit committees may decline if independent directors lack the necessary skills and attributes, leading to lower audit quality and increased information asymmetry. Therefore, we hypothesise:

Hypothesis 3e. *Audit committee independence strengthens firm efficiency through the effectiveness of SOP.*

2.3.3.6 | Ownership Concentration. Institutional investors and individual shareholders serve as significant external control mechanisms in addressing agency problems within corporate governance (Ning, Hu, and Garza-Gomez 2015). High ownership concentration allows for more effective monitoring of CEOs and reduces agency costs because of larger shares and lower coordination costs compared with dispersed ownership (Khan, Dharwadkar, and Brandes 2005). Conversely, dispersed ownership weakens monitoring capabilities, leading to higher coordination costs and increased information asymmetry (Khan, Dharwadkar, and Brandes 2005). Belcredi et al. (2014) find that domestic investors play a significant role in SOP, whereas foreign investors are less prominent. Kimbro and Xu (2016) report that firms with lower institutional ownership tend to exhibit better efficiency. However, Crawford, Nelson, and Rountree (2020) suggest that higher institutional ownership may result in more negative outcomes in SOP voting, particularly for firms with high pay ratios, indicating shareholder satisfaction with firm efficiency. Based on these findings, we hypothesise:

Hypothesis 3f. *Higher ownership concentration enhances firm efficiency through the effectiveness of SOP.*

3 | Data and Methodology

3.1 | Sample

This study required firms to have available SOP voting data during the sample period to be included in the analysis. Companies that were delisted from their respective indices, underwent mergers or acquisitions or were listed for only 1 year were excluded from the sample. The initial dataset comprised 200 firms from the S&P/ASX 200, 250 firms from the S&P/TSX, 350 companies from the FTSE 350 and 1500 firms from the S&P 400, S&P 500 and S&P 600 indices. Following initial data collection, 30 firms from the S&P/ASX 200 and 26 from the S&P/TSX were excluded because of missing SOP voting or essential financial data. Additionally, 34 companies from the FTSE 350 and 151 from the S&P indices were removed due to incomplete SOP voting data or involvement in mergers and acquisitions. To ensure robust statistical analysis, variables were trimmed at the 1st and 99th percentiles to mitigate the influence of extreme values. This process resulted in a final sample of 1931 firms, distributed as follows: 170 firms from Australia, 96 from Canada, 316 from the UK and 1349 from the USA. The study did not differentiate between financial and nonfinancial firms because some nonfinancial conglomerates, like Ford and General Electric, have substantial interests across multiple sectors.

The study employs pooled panel data from various sources to analyse CEO total remuneration, corporate governance structures, firm financial characteristics (FFCs), CEO demographics (age and gender) and macroeconomic factors such as gross domestic product (GDP) growth. Data on CEO total compensation, CEO age and corporate governance variables were manually extracted from companies' annual reports because of incomplete information in available databases. Additionally, foreign currency-denominated values were converted to US dollars using end-of-year exchange rates provided by the World Bank. A summary of the data is presented in Table 1.

3.2 | Main Variables

3.2.1 | Dependent Variables

Table 2 provides the operational definitions of the research variables. The study employs three primary measures of firm efficiency: ROIC, EP and Tobin's *Q*.

- *ROIC* is calculated as net operating profit after tax (NOPAT) divided by total invested capital, expressed as a percentage. It is derived by subtracting the cost of goods sold (COGS), selling; general and administrative expenses (SG&A); research and development expenses (R&D) from sales revenue. This metric evaluates a firm's efficiency in capital allocation, encompassing production, marketing and R&D activities (Tang and Liou 2010; Liu, Wei, and Xie 2014; Van Clieaf, O'Byrne, and Leeflang 2014; Oh and Park 2015).
- *Economic profit* (*EP*) serves as a measure of value creation, calculated by deducting the cost of capital from NOPAT. Unlike traditional accounting profit, EP focuses on the creation of wealth for shareholders. A positive EP indicates that the firm is generating value above its cost of capital, whereas a persistent negative EP may signal underlying

TABLE 1 | Sample selection.

	Australia	Canada	UK	USA	Total
Initial sample	200	122[a]	350	1500	2172
Missing firms data[b]	30	26	34	151	241
Final sample	170	96	316	1349	1931
Time of 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 have adopted SOP regulation is 122 firms.
[b]Firms are excluded because SOP votes' data are not available; they are merged with others, and a firm has been listed for 1 year during the period of study.
[c]The time is different among the four countries due to the year of adopting the SOP rule and subsequent changes. In Australia, for example, the two-strike rule has been active since July 2011; in Canada, the advisory vote was approved in 2012; in the UK, a binding vote became effective in October 2013 and in the USA, advisory voting has been adopted since 2011.

TABLE 2 | Definition and sources of variables.

Variables	Definition	Source
Dependent variables		
Economic profit (EP)	EP is calculated as (Net operating profit after tax [NOPAT] minus capital charge)/[total assets]	Bloomberg database
Return on invested capital (ROIC)	ROIC is calculated as (Net operating profit after taxes [NOPAT] divided by invested capital)	Bloomberg database
Tobin's *Q*	Tobin's *Q* = equals (market capitalisation + total liabilities + preferred equity + minority interest)/total assets	Bloomberg database
Key independent variable of interests		
SOP votes for (SOP FOR)	The number of votes for executive compensation divided by total votes for and against CEO pay	Bloomberg database and firms' annual reports
CEO personal traits		
CEO physiological characteristics	Natural log of CEO's age in years	BoardEX and firms' annual reports
CEO social characteristics	CEO gender is a dummy that assumes the value 1 if the CEO is a female and 0 otherwise	BoardEX and firms' annual reports
Control for CG mechanism		
Ln board size (Ln BSIZE)	The number of directors over the company's board size	Bloomberg database and firms' annual reports
Independent directors (INDDIR)	The ratio of independent directors on a company's board	Bloomberg database and firm's annual reports
Compensation committee independence (CCI)	The percentage of independent compensation committee members over board size	Bloomberg database and firms' annual reports
Audit committee independence	The ratio of independent audit committee members on the board	Bloomberg database and firm's annual reports
Ownership concentration	The percentage of shareholding by the top 10 shareholders	Thomson Reuters Eikon
CEO duality	Duality is coded as one if the chair and the CEO are the same person and 0 otherwise	Bloomberg database
Control for firm financial characteristics		
Market capitalisation (Ln MC)	The total current market value of all of a company's outstanding shares is stated in the pricing currency	Bloomberg database
Stock return (SR)	Calculated as (stock price at the end of year *t* minus the stock price at the end of year *t*−1 plus dividends per share)/stock price at the end of year *t*−1.	Bloomberg database
Market to book ratio (M/B)	The ratio of the stock price to the book value per share	Bloomberg database

(Continues)

TABLE 2 | (Continued)

Variables	Definition	Source
Stock Volatility (SV)	The standard deviation of the day-to-day logarithmic price changes is expressed in percentage of the day before the current	Bloomberg database
Leverage (LEV)	The ratio of the total amount of debt relative to assets	Bloomberg database
Capital expenditure (CAPEX)	The amount the company spent on purchasing tangible fixed assets divided by total assets	Bloomberg database
Intangible assets ratio (IAR)	IAR is calculated as total intangible assets scaled by total assets	Bloomberg
Control for the macroeconomic environment		
GDP growth	The GDP growth rate measures how fast the economy is growing	World Bank

issues with the firm's business strategy, economic model, or leadership (Allaire 2012; Van Clieaf, O'Byrne, and Leeflang 2014; Fisch, Palia, and Solomon 2018).

- *Tobin's Q* is a forward-looking indicator that reflects the market's valuation of a company's assets. It measures the ratio of the market value of a firm's assets to their replacement cost, providing insight into the firm's attractiveness to investors and its wealth generation for shareholders and creditors (Haniffa and Hudaib 2006; Chen et al. 2010; Conheady et al. 2015; Isakov and Weisskopf 2014; Carter et al. 2010).

Together, these measures offer a comprehensive assessment of a firm's efficiency in capital allocation, value creation and market positioning (Haniffa and Hudaib 2006; Carter et al. 2010; Tang and Liou 2010; Chen et al. 2010; Allaire 2012; Liu, Wei, and Xie 2014; Isakov and Weisskopf 2014; Van Clieaf, O'Byrne, and Leeflang 2014; Oh and Park 2015; Conheady et al. 2015; Fisch, Palia, and Solomon 2018).

3.2.2 | Independent Variables

The study examines several independent variables that could impact firm efficiency, including SOP votes, CEO personal traits (age and gender) and various CGMs. The key governance variables analysed include board size, board independence, compensation committee independence (CCI), audit committee independence (ACI), ownership concentration and CEO duality.

To control for potential confounding factors, the study also includes firm-specific financial characteristics such as firm size, stock return, stock volatility, market-to-book ratio, capital expenditure ratio and leverage. Additionally, GDP growth is included as a macroeconomic control variable to account for external economic conditions (Elshandidy and Neri 2015).

This comprehensive approach allows for a robust analysis of the factors influencing firm efficiency and provides a deeper understanding of how corporate governance practices and CEO characteristics affect the outcomes of SOP votes.

3.3 | Empirical Designs

First, we test the impact of SOP on firm efficiency; controlling for CGMs; FFCs; GDP growth rate (GDP); country and industry dummies.

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

Second, we examine the moderating effects of CEO age and gender on the effectiveness of SOP regulation. We use interaction terms, namely SOPFORLn CEO age and SOPFORCEO gender, to capture the moderating effect. The study also controls CGMs, financial fraud controls and GDP, and includes, country and industry dummies as additional control variables.

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

$$\begin{aligned}\text{firm efficiency}_{it} = {} & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{CEOgender} \\ & + a_3\text{SOPFOR} * \text{CEOgen}der + \text{a}_4\text{CGMs}_{it} \\ & + \text{a}_5\text{FFCs}_{it} + \text{a}_6\ \text{GDP}_{it} + a_7\text{CountryDummy} \\ & + a_8\text{IndustryDummy} + e_{it}\end{aligned} \tag{3}$$

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

$$\begin{aligned}\text{firm efficiency}_{it} = \; & a_0 + a_1\text{SOPFOR}_{it} + a_2\text{CGMs}_{it} \\ & + a_3\text{SOPFOR} * \text{CGMs}_{it} + + a_5\text{FFC}_{it} \\ & + a_6\ \text{GDP}_{it} + a_7\text{CountryDummy} \\ & + a_8\text{IndustryDummy} + e_{it}\end{aligned} \tag{4}$$

Finally, we estimate a comprehensive model that incorporates all the previously tested moderating effects:

$$\begin{aligned}\text{firm efficiency}_{it} = \; & a_0 + a_1\text{SOPFOR}_{it} + a_4\text{LnCEOage} \\ & + a_5\text{SOPFOR} * \text{LnCEOage}_{it} + a_6\ \text{CEO gender} \\ & + \text{a}_7\text{SOPFOR} * \text{CEO gender} + a_8\text{CGMs}_{it} \\ & + a_9\text{SOPFOR} * \text{CGMs}_{it} + a_{10}\text{FFCs}_{it} \\ & + a_{11}\ \text{GDP}_{it} + a_{12}\text{CountryDummy} \\ & + a_{13}\text{IndustryDummy} + e_{it}\end{aligned} \tag{5}$$

3.4 | Methodology and Data Description

This study employs pooled panel data models to address the issue of endogeneity, a common challenge in econometric analysis. High correlations among independent variables can lead to unstable coefficient estimates, particularly when correlations exceed 80%. However, our correlation analysis indicates that the highest correlation coefficients in our dataset are below this critical threshold. Additionally, we conducted variance inflation factor (VIF) and tolerance tests, both of which confirm that multicollinearity is not a significant concern in our analysis.

To further address potential endogeneity, we applied the Durbin–Wu–Hausman (DWH) test, which revealed that the ordinary least squares (OLS) estimator might suffer from inconsistency and bias. To mitigate these issues, we adopted the IV-GMM estimation method, as recommended by Huang et al. (2018) and utilised external instruments from other countries. We validated the IV-GMM approach using the Hansen *J* statistic to check for over-identification restrictions, the Hayashi *C* test for endogeneity and the *F*-statistic to assess the strength of the instruments. These diagnostics indicated no problems with over-identification or endogeneity and the instrumental variables were found to be strong.

Table 3 presents descriptive statistics for the key variables used in the analysis. The median EP ratio is −0.002, suggesting that firms in the four countries studied face challenges related to their economic models, business strategies and/or executive leadership. The average ROIC is 9%, which, according to Van Clieaf, O'Byrne, and Leeflang (2014), is a strong indicator of a firm's successful strategy, competitive advantage and execution quality. Additionally, the mean Tobin's *Q* of 2.112 for the sampled firms indicates that their market value exceeds the amortised historical cost of their assets, as noted by Carter et al. (2010).

The average percentage of votes supporting CEO pay packages is 91.5%, slightly lower than the 92% reported by Cullinan, Mahoney, and Roush (2017) but close to the average found in Alissa (2015), Alissa (2015). Regarding CEO personal traits, the average CEO age is 56, higher than the 52 reported by Correa and Lel (2016) and the 51 reported by Wang and Chen (2020), but very close to the average of 57 in Denis, Jochem, and Rajamani (2020). The data also show that, on average, 3.5% of CEOs are female, which is slightly higher than the 3% reported by Dah and Frye (2017) for the period 1997–2012, but lower than the 4% reported by Hanousek, Shamshur, and Tresl (2019).

In terms of CGMs, the average board size is 9.37 members, aligning with the range recommended by Lipton and Lorsch (1992) and Haniffa and Hudaib (2006). Beiner et al. (2006) suggest that smaller boards may be more effective because of fewer coordination and communication challenges. On average, independent directors constitute 79% of the total board members, higher than the 56% reported by Alkalbani, Cuomo, and Mallin (2019), where independent directors are essential for ensuring transparent financial reporting, as argued by Erkens, Hung, and Matos (2012). However, the average percentage of independent directors on compensation and audit committees is 43% and 44%, respectively, indicating potential weaknesses in these committees' ability to design effective CEO compensation and ensure high-quality financial reporting.

Ownership concentration, represented by the share of the top 10 shareholders, ranges from 3% to 68%, with an average of 28% and a median of 27%. These levels suggest a moderate degree of ownership concentration, which may positively influence SOP outcomes by providing shareholders with greater leverage in governance matters. Additionally, the data show that 35% of firms have CEO duality, where the CEO also serves as the board chair. Bai et al. (2004) argue that such duality can weaken the board's monitoring role. The CEO power proxy, CPS, has an average of 43%, higher than the 35.7% reported by Bebchuk, Cremers, and Peyer (2011), indicating significant managerial influence in the sampled firms.

Regarding FFCs, the average total assets across firms is $21.8 billion. Large firms may benefit from greater capacity to generate internal funds and a broader range of capabilities, but they may also face coordination issues that could negatively impact performance (Rashid et al. 2010). The median stock return is 15.7%, and the median firm growth rate is 1.41 times, suggesting rapid business expansion, though profitability may be realised in the long term.

The mean leverage ratio is 13%. Jensen (1986) posits that higher leverage can lead to financial distress, limiting a firm's ability to pursue growth opportunities, though it can also enhance performance by reducing agency conflicts related to excess cash flows. Henry (2008) notes that the impact of leverage can be ambiguous: a positive association may indicate efficient debt use, whereas a negative association might reflect increased capital costs and financial distress. The average capital expenditure ratio is 4.6%. Finally, the mean GDP growth rate for the macroeconomic context is 2.2%, slightly lower than the 2.7% reported by Correa and Lel (2016).

These descriptive statistics provide a comprehensive overview of the variables considered in this study, setting the stage for the subsequent econometric analysis.

TABLE 3 | Descriptive statistics for all samples are described in Table 1.

Variables	Mean	Median	Standard deviation	Min	Max
ROIC	0.093	0.081	0.110	−0.270	0.528
EP	−0.004	−0.002	0.075	−0.321	0.220
Tobin's *Q*	2.112	1.504	2.393	0.786	20.984
SOPFOR	0.915	0.963	0.125	0.312	0.999
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
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
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 top 10	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 variables are economic profit (EP), return on invested capital (ROIC), and Tobin's *Q*. Independent variable is SOP FOR, which is calculated as (the number of votes for executive compensation divided by total votes for and against CEO pay); SOP FOR*CEO pay (interaction variable between SOP FOR and CEO compensation). Corporate governance mechanisms are BSIZE (board size), INDDIR (independent directors), CCI (compensation committee independence) and CEO duality (indicates whether the company's Chief Executive Officer is also Chairman of the Board or not). Firm financial characteristics are, LEV, leverage; SV, stock volatility; CAPEX, capital expenditure ratio; FCF, free cash flow ratio; M/B, market to book ratio; MC, market capitalisation, which is the total current market value of all of a company's outstanding shares stated in the pricing currency and SR, stock return. CEO pay level: Ln CEO pay, which is calculated as the natural logarithm of the sum of salary, bonus, other annual, the total value of restricted stock granted, stock options granted, long-term incentive payouts, and others. *GDP growth*, which is the macroeconomic level and measures how fast the economy is growing.

3.5 | Baseline Panel Regression Analysis

3.5.1 | Does SOP Improve Firm Efficiency Measures?

The results from the IV-GMM estimation for Models 1–5 are presented in Tables 4, 5 and 6. Table 4, Panels A–H, shows the impact of SOP votes on firm efficiency, measured by EP. The results indicate a positive and significant relationship at the 1% level, suggesting that SOP votes effectively incentivise top management to enhance shareholder wealth. Similarly, Table 5 reveals a positive and significant association between SOP votes and ROIC, a measure of corporate efficiency. This suggests that

TABLE 4 | The moderating effects of CEO personal traits and CG mechanisms on firm efficiency through say-on-pay.

	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F	Panel G	Panel H
Variables	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**
SOPFOR	0.036***	0.038***	0.040***	0.041***	0.040***	0.038***	0.042***	0.042***
	−0.007	−0.007	−0.008	−0.008	−0.008	−0.007	−0.008	−0.008
Ln CEO age		−0.017**			−0.016**	−0.018**	−0.013*	−0.016**
		−0.007			−0.007	−0.007	−0.007	−0.007
SOPFOR*Ln CEO age		−0.002**			−0.002**	−0.001*	−0.002**	−0.002**
		−0.001			−0.001	−0.001	−0.001	−0.001
Gender			0.001		0.001	0.000	0.000	0.001
			−0.004		−0.004	−0.004	−0.004	−0.004
SOPFOR*Gender			−0.002		−0.002	−0.001	−0.0002	−0.0002
			−0.004		−0.004	−0.005	−0.004	−0.004
Ln BSIZE	0.006	0.006	0.008	0.005	0.005	0.004	0.004	0.005
	−0.009	−0.009	−0.008	−0.009	−0.009	−0.009	−0.008	−0.009
SOPFOR*BSIZE				−0.0003		−0.0003	−0.0002	−0.0002
				−0.001		−0.001	−0.001	−0.001
INDDIR	−0.032***	−0.035***	−0.043***	−0.032***	−0.034***	−0.041***	−0.034***	−0.035***
	−0.010	−0.010	−0.010	−0.010	−0.010	−0.009	−0.010	−0.010
SOPFOR*INDDIR				0.002*		0.002**	0.002*	0.002*
				−0.001		−0.001	−0.001	−0.001
CEO duality	0.003	0.004*	0.002	0.003	0.003*	0.003*		0.003*
	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002		−0.002
SOPFOR*CEO duality				−0.0003	0.0002	0.0001		0.0001
				−0.001	−0.001	−0.001		−0.001
CPS	−0.006	−0.005	−0.009	−0.007	−0.006		−0.007	−0.006
	−0.007	−0.007	−0.007	−0.007	−0.007		−0.007	−0.007
SOPFOR*CPS				−0.001	−0.001		−0.00143*	−0.00141*
				−0.001	−0.001		−0.001	−0.001
CCI	0.033***	0.032***	0.035***	0.033***	0.032***	0.032***	0.032***	0.032***
	−0.009	−0.009	−0.009	−0.009	−0.009	−0.009	−0.009	−0.009
SOPFOR*CCI				0.003**		0.002**	0.003**	0.003**
				−0.001		−0.001	−0.001	−0.001
ACI	−0.003	−0.001	0.000	−0.004	−0.002	0.006	−0.002	−0.002
	−0.010	−0.010	−0.010	−0.010	−0.010	−0.010	−0.010	−0.010
SOPFOR*ACI				−0.001		−0.001	−0.001	−0.001
				−0.001		−0.001	−0.001	−0.001
OWNCON	−0.028***	−0.029***	−0.026***	−0.028***	−0.030***	−0.025***	−0.029***	−0.029***
	−0.008	−0.008	−0.008	−0.008	−0.008	−0.008	−0.008	−0.008

(Continues)

TABLE 4 | (Continued)

	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F	Panel G	Panel H
Variables	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**	**EP**
SOPFOR*OWNCON				0.001		0.001	0.001	0.001
				−0.001		−0.001	−0.001	−0.001
Ln TA	0.001	0.001	0.002	0.001	0.001	0.002	0.002	0.001
	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002
M/B	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001
SR	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***
	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003
SV	−0.172***	−0.170***	−0.160***	−0.171***	−0.169***	−0.169***	−0.169***	−0.169***
	−0.013	−0.012	−0.012	−0.013	−0.012	−0.012	−0.012	−0.012
CAPEX	−0.045**	−0.048**	0.002	−0.045**	−0.048**	−0.046**	−0.048**	−0.048**
	−0.019	−0.020	−0.020	−0.019	−0.020	−0.019	−0.019	−0.020
LEV	0.016	0.016*	0.013	0.014	0.015*	0.006	0.016*	0.016*
	−0.009	−0.009	−0.009	−0.009	−0.009	−0.008	−0.009	−0.009
GDP growth	−0.399**	−0.398**	−0.382**	−0.392**	−0.396**	−0.400**	−0.405**	−0.392**
	−0.171	−0.171	−0.171	−0.17	−0.171	−0.166	−0.171	−0.171
Constant	−0.014	0.046	−0.032	−0.019	0.041	0.041	0.024	0.039
	−0.035	−0.045	−0.034	−0.035	−0.045	−0.045	−0.044	−0.045
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic tests								
Hansen J $\chi 2$	0.128	0.136	0.123	0.128	0.135	0.149	0.153	0.136
GMM *C* statistic $\chi 2$	0.586	0.585	0.612	0.586	0.587	0.572	0.586	0.588
F-statistic for weak instrument	288.162***	289.818***	455.816***	286.749***	288.629***	233.896***	296.875***	288.126***

Note: (i) Dependent variable: *Economic profit ratio* computed as the ratio of economic profit to total assets 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 0 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 0 otherwise), *SOP FOR*CEO duality* (interaction variable between SOP FOR and CEO duality), *CPS* (CEO pay slice, measured by the percent of the total annual compensation of the three to five highest-paid managers claimed by the CEO), *SOPFOR*CPS* (interaction variable between SOPFOR and CPS); *BSIZE* (board size), *SOPFOR*BSIZE* (interaction variable between SOP FOR and 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. 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. *, ** and *** denote statistical significance at a 10%, 5% and 1% level, respectively. The fitness of the models is inferred from *R*-square, root MSE, and Wald statistic, with the null of the Wald test being that the parameters of interest are jointly equal to zero.

SOP votes contribute to improving the firm's business strategy and management effectiveness.

Furthermore, across all samples, a significant and positive correlation between SOP votes and Tobin's *Q* is observed at the 1% level. Notably, the coefficients for Tobin's *Q* are higher than those for EP and ROIC, aligning with the findings of Correa and Lel (2016), which also documented a strong positive link between SOP regulation and Tobin's *Q*. Based on these results, we statistically accept Hypotheses 1a, 1b and 1c, which propose a favourable impact of SOP votes on firm efficiency measures. The evidence suggests that SOP votes have been successful in

TABLE 5 | The moderating effects of CEO personal traits and CG mechanisms on firm efficiency through say-on-pay.

	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F	Panel G	Panel H
Variables	**ROIC**	**ROIC**	**ROIC**	**ROIC**	**ROIC**	**ROIC**	**ROIC**	**ROIC**
SOPFOR	0.099***	0.101***	0.098***	0.108***	0.103***	0.102***	0.109***	0.110***
	−0.010	−0.010	−0.010	−0.010	−0.010	−0.010	−0.010	−0.011
Ln CEO age		−0.0254**			−0.024*	−0.025**	−0.019*	−0.024**
		−0.011			−0.011	−0.011	−0.011	−0.011
SOPFOR*Ln CEO age		−0.003***			−0.003**	−0.002**	−0.003***	−0.003***
		−0.001			−0.001	−0.001	−0.001	−0.001
Gender			0.013*		0.008	0.006	0.007	0.007
			−0.007		−0.007	−0.007	−0.007	−0.007
SOPFOR*Gender			0.001		0.001	0.004	0.005	0.004
			−0.006		−0.006	−0.006	−0.006	−0.006
Ln BSIZE	−0.019	−0.020	−0.016	−0.020	−0.021*	−0.021	−0.024*	−0.021*
	−0.013	−0.012	−0.013	−0.013	−0.013	−0.013	−0.012	−0.013
SOPFOR*BSIZE				0.003**		0.002*	0.003**	0.003**
				−0.001		−0.001	−0.001	−0.001
INDDIR	−0.050***	−0.052***	−0.062***	−0.051***	−0.053***	−0.060***	−0.053***	−0.054***
	−0.014	−0.014	−0.014	−0.013	−0.014	−0.013	−0.014	−0.014
SOPFOR*INDDIR				0.004***		0.004***	0.004***	0.004***
				−0.001		−0.001	−0.001	−0.001
CEO duality	0.038***	0.037***	0.042***	0.039***	0.038***	0.042***	0.036***	0.038***
	−0.013	−0.013	−0.013	−0.013	−0.013	−0.013	−0.013	−0.013
SOPFOR*CEO duality				0.004***		0.004**	0.004***	0.004***
				−0.001		−0.001	−0.001	−0.001
CPS	0.004	0.006	−0.002	0.002	0.006	0.013	0.006	0.005
	−0.015	−0.015	−0.015	−0.015	−0.015	−0.015	−0.015	−0.015
SOPFOR*CPS				0.002		0.002	0.002	0.002
				−0.001		−0.001	−0.001	−0.001
CCI	0.006**	0.007***	0.007**	0.005**	0.007***	0.006**		0.007**
	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003		−0.003
SOPFOR*CCI				−0.001	−0.001	−0.001		−0.001
				−0.001	−0.001	−0.001		−0.001
ACI	0.011	0.013	0.014	0.009	0.011		0.0111	0.011
	−0.011	−0.011	−0.011	−0.011	−0.011		−0.0108	−0.011
SOPFOR*ACI				−0.001	−0.001		−0.00187*	−0.002
				−0.001	−0.001		−0.001	−0.001
OWNCON	−0.035***	−0.037***	−0.033***	−0.035***	−0.037***	−0.034***	−0.037***	−0.037***
	−0.013	−0.013	−0.013	−0.013	−0.013	−0.012	−0.013	−0.013

(Continues)

TABLE 5 | (Continued)

Variables	Panel A ROIC	Panel B ROIC	Panel C ROIC	Panel D ROIC	Panel E ROIC	Panel F ROIC	Panel G ROIC	Panel H ROIC
SOPFOR*OWNCON				0.003**		0.002**	0.003**	0.003**
				−0.001		−0.001	−0.001	−0.001
Ln TA	0.006**	0.006**	0.005*	0.006**	0.006**	0.006**	0.007**	0.006**
	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003	−0.003
M/B	0.012***	0.012***	0.013***	0.012***	0.012***	0.013***	0.013***	0.012***
	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001
SR	0.040***	0.040***	0.043***	0.041***	0.040***	0.041***	0.041***	0.040***
	−0.004	−0.004	−0.004	−0.004	−0.004	−0.004	−0.004	−0.004
SV	−0.125***	−0.124***	−0.112***	−0.124***	−0.123***	−0.126***	−0.121***	−0.122***
	−0.018	−0.018	−0.018	−0.017	−0.018	−0.017	−0.018	−0.018
CAPEX	−0.053**	−0.056**	−0.049*	−0.055**	−0.055**	−0.052**	−0.057**	−0.058**
	−0.025	−0.026	−0.026	−0.025	−0.026	−0.025	−0.025	−0.025
LEV	−0.018	−0.015	−0.013	−0.019	−0.015	−0.035***	−0.016	−0.016
	−0.014	−0.015	−0.015	−0.014	−0.015	−0.014	−0.015	−0.015
GDP growth	−1.015***	−1.017***	−0.942***	−1.007***	−1.015***	−0.958***	−1.032***	−1.007***
	−0.251	−0.252	−0.254	−0.25	−0.252	−0.244	−0.251	−0.251
Constant	−0.035	0.056	−0.012	−0.047	0.047	0.050	0.011	0.040
	−0.051	−0.066	−0.051	−0.051	−0.067	−0.067	−0.065	−0.067
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic tests								
Hansen $J\chi 2$	0.387	*0.372*	0.596	0.402	0.385	0.302	0.444	0.405
GMM C statistic $\chi 2$	0.586	*0.587*	0.571	0.587	0.587	0.572	0.586	0.588
F-statistic for weak instrument	288.154***	289.869***	432.919***	286.752***	288.613***	234.081***	296.869***	288.169***

Note: (i) Dependent variable: *ROIC* is calculated as (Net operating profit after taxes [NOPAT] divided by invested capital) 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 0 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 0 otherwise), *SOP FOR*CEO duality* (interaction variable between SOP FOR and CEO duality), *CPS* (CEO pay slice, measured by the percent of the total annual compensation of the three to five highest-paid managers claimed by the CEO), *SOPFOR*CPS* (interaction variable between SOPFOR and CPS); *BSIZE* (board size), *SOPFOR*BSIZE* (interaction variable between SOP FOR and 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. *, ** and *** denote statistical significance at a 10%, 5% and 1% level, respectively. The fitness of the models is inferred from R-square, root MSE, and Wald statistic, with the null of the Wald test meaning that the parameters of interest are jointly equal to zero.

enhancing firm efficiency and that CEOs are more attentive to firm performance, recognising the importance of corporate effectiveness in influencing voting outcomes at AGMs. These findings support the view that compensation contracts negotiated between effective company boards and senior managers lead to packages that align the interests of top executives and shareholders.

3.5.2 | CEO Personal Traits and Firm Efficiency

Tables 4, 5 and 6 also analyse the impact of CEO age and gender on firm efficiency. The data reveals significant patterns. Specifically, Table 6 shows a significant negative correlation between CEO age and firm efficiency at both the 5% and 1% levels, suggesting a preference for younger CEOs who are perceived

TABLE 6 | The moderating effects of CEO personal traits and CG mechanisms on firm efficiency through say-on-pay.

	Panel A	Panel B	Panel C	Panel D	Panel E	Panel F	Panel G	Panel H
Variables	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***	**Tobin's *Q***
SOPFOR	1.714***	1.719***	1.748***	1.920***	1.995***	1.612***	1.928***	1.957***
	−0.244	−0.247	−0.254	−0.266	−0.272	−0.249	−0.277	−0.276
Ln CEO age		−0.772***			−0.740***	−0.692***	−0.692***	−0.752***
		−0.246			−0.244	−0.234	−0.240	−0.244
SOPFOR*Ln CEO age		−0.014			−0.017	0.013	−0.027	−0.016
		−0.025			−0.026	−0.026	−0.025	−0.026
Gender			−0.083		−0.018	−0.025	−0.027	−0.023
			−0.138		−0.143	−0.137	−0.143	−0.143
SOPFOR*Gender			−0.183**		−0.205**	−0.175*	−0.156*	−0.172*
			−0.093		−0.086	−0.100	−0.091	−0.092
Ln BSIZE	−2.364***	−2.347***	−2.394***	−2.383***	−2.376***	−2.177***	−2.401***	−2.366***
	−0.255	−0.254	−0.241	−0.255	−0.254	−0.253	−0.253	−0.255
SOPFOR*BSIZE				0.026		0.021	0.033	0.027
				−0.031		−0.032	−0.031	−0.031
INDDIR	−1.677***	−1.738***	−1.771***	−1.641***	−1.695***	−1.584***	−1.692***	−1.699***
	−0.303	−0.305	−0.309	−0.301	−0.308	−0.282	−0.307	−0.307
SOPFOR*INDDIR				−0.005		0.001	−0.015	−0.007
				−0.029		−0.029	−0.029	−0.029
CEO duality	0.046	0.090*	−0.002	0.042	0.082*	0.064		0.086*
	−0.049	−0.049	−0.048	−0.049	−0.050	−0.048		−0.050
SOPFOR*CEO duality				−0.060**	−0.054**	−0.070***		−0.057**
				−0.026	−0.026	−0.027		−0.026
CPS	0.479**	0.481**	0.172	0.339	0.354		0.356	0.342
	−0.215	−0.217	−0.217	−0.215	−0.216		−0.217	−0.217
SOPFOR*CPS				−0.082***	−0.081***		−0.086***	−0.078***
				−0.024	−0.023		−0.024	−0.024
CCI	−0.631**	−0.631**	−0.655**	−0.629**	−0.614**	−0.494*	−0.645**	−0.626**
	−0.276	−0.277	−0.275	−0.276	−0.276	−0.266	−0.278	−0.278
SOPFOR*CCI				−0.024		−0.028	−0.020	−0.025
				−0.036		−0.039	−0.036	−0.036
ACI	−0.625*	−0.565*	−0.581*	−0.633*	−0.588*	−0.433	−0.551*	−0.574*
	−0.323	−0.323	−0.326	−0.323	−0.323	−0.31	−0.323	−0.323
SOPFOR*ACI				0.057		0.052	0.052	0.056
				−0.035		−0.037	−0.035	−0.036
OWNCON	0.386	0.408	0.537*	0.405	0.423	0.338	0.408	0.421
	−0.282	−0.283	−0.285	−0.283	−0.284	−0.268	−0.284	−0.285

(Continues)

TABLE 6 | (Continued)

Variables	Panel A Tobin's *Q*	Panel B Tobin's *Q*	Panel C Tobin's *Q*	Panel D Tobin's *Q*	Panel E Tobin's *Q*	Panel F Tobin's *Q*	Panel G Tobin's *Q*	Panel H Tobin's *Q*
SOPFOR*OWNCON				−0.034		−0.052	−0.030	−0.034
				−0.034		−0.035	−0.034	−0.034
Ln TA	0.363***	0.364***	0.388***	0.372***	0.375***	0.342***	0.380***	0.373***
	−0.049	−0.049	−0.049	−0.049	−0.049	−0.051	−0.049	−0.049
M/B	0.153***	0.151***	0.146***	0.153***	0.151***	0.166***	0.152***	0.151***
	−0.027	−0.027	−0.028	−0.027	−0.027	−0.024	−0.027	−0.027
SR	2.252***	2.262***	2.224***	2.248***	2.260***	2.249***	2.261***	2.254***
	−0.162	−0.163	−0.163	−0.161	−0.162	−0.157	−0.162	−0.162
SV	1.727***	1.682***	1.672***	1.758***	1.711***	1.515***	1.721***	1.710***
	−0.389	−0.39	−0.394	−0.389	−0.39	−0.378	−0.39	−0.389
CAPEX	1.129**	1.146**	1.248**	1.158**	1.171**	1.713***	1.151**	1.168**
	−0.552	−0.558	−0.57	−0.549	−0.556	−0.565	−0.557	−0.556
LEV	−1.911***	−1.910***	−1.964***	−1.919***	−1.915***	−2.039***	−1.932***	−1.923***
	−0.322	−0.326	−0.325	−0.322	−0.327	−0.294	−0.326	−0.326
GDP growth	32.53***	32.95***	31.14***	32.62***	32.95***	32.63***	32.80***	32.96***
	−6.746	−6.773	−6.742	−6.735	−6.772	−6.497	−6.741	−6.762
Constant	−3.077***	−0.060	−3.224***	−3.396***	−0.606	−0.204	−0.779	−0.478
	−0.902	−1.271	−0.914	−0.913	−1.279	−1.243	−1.244	−1.274
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic tests								
Hansen $J\chi 2$	0.350	0.302	0.338	0.357	0.288	0.193	0.324	0.292
GMM C statistic $\chi 2$	0.586	*0.586*	0.612	0.586	0.587	0.572	0.586	0.587
F-statistic for weak instrument	288.205***	289.840***	455.717***	286.793***	288.649***	233.910***	296.878***	288.146***

Note: (i) Dependent variable: *Tobin's Q* is computed as the ratio of the market value of a firm to the replacement cost of the firm's assets 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 0 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 0 otherwise), *SOP FOR*CEO duality* (interaction variable between SOP FOR and CEO duality), *CPS* (CEO pay slice, measured by the percent of the total annual compensation of the three to five highest-paid managers claimed by the CEO), *SOPFOR*CPS* (interaction variable between SOPFOR and CPS); *BSIZE* (board size), *SOPFOR*BSIZE* (interaction variable between SOP FOR and 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. 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. *, ** and *** denote statistical significance at a 10%, 5% and 1% level, respectively. The fitness of the models is inferred from *R*-square, root MSE, and Wald statistic, with the null of the Wald test being that the parameters of interest are jointly equal to zero.

as more dependable, effective and trustworthy compared with their older counterparts.

The interaction term between SOPFOR and CEO age also shows a significant negative effect, which contrasts with the findings of Wang and Chen (2020), who reported a positive relationship between CEO age and profitability. As a result, we reject Hypothesis 2a, which posits that older CEOs enhance firm efficiency through the efficacy of SOP.

Additionally, our regression results highlight the impact of gender on firm efficiency. Tables 4 and 5 show a positive effect of gender on EP and ROIC, respectively, whereas Table 6 reveals a negative effect on Tobin's *Q*. The interaction between

SOPFOR and Gender in Table 6 shows a significant negative effect on Tobin's *Q*, suggesting that firms led by female CEOs may exhibit lower efficiency compared with those led by male CEOs. This finding is consistent with the research of Faccio, Marchica, and Mura (2016) and Hanousek, Shamshur, and Tresl (2019), who also found a negative relationship between CEO gender and firm efficiency. One possible explanation is that female CEOs may be more cautious and may decline certain projects with positive net present value (NPV), potentially leading to this outcome.

3.5.3 | Power Distribution and Firm Efficiency

The data in Tables 4, 5 and 6 incorporates various CGMs in Models 4 and 5. One key finding is the significant negative impact of board size on Tobin's *Q*, observed at the 1% significance level across Panels D and F–H, as well as in Table 5. Additionally, the coefficients for board size show a negative relationship with ROIC at the 10% significance level across Panels E, G and H. These results align with previous research by Cheng (2008) and Mollah and Zaman (2015), which found that larger boards are less effective, likely due to coordination and communication challenges. However, other studies, such as De Andres and Vallelado (2008) and Pathan and Faff (2013), suggest that larger boards can positively impact performance. Therefore, Hypothesis 3a, which posits that smaller boards enhance firm efficiency through the effectiveness of SOP, remains valid.

Interestingly, a positive and significant relationship is observed between the interaction term SOPFOR and board size, particularly impacting ROIC at the 10% significance level across Panels D, F, G and H, suggesting increased vigilance among board members.

Furthermore, the regression models consistently show negative and significant coefficients for independent directors across all samples, including EP, ROIC and Tobin's *Q*. This suggests that independent directors do not inherently improve firm efficiency. This finding is in line with research by Carter et al. (2010) and Mollah and Zaman (2015), which argue that while independent directors may enhance oversight, their lack of company-specific knowledge can hinder optimal decision-making (Liang, Xu, and Jiraporn 2013). This supports the idea that SOP's effectiveness is the primary channel through which independent directors contribute to firm efficiency.

Regarding CEO power measures, the data reveals a positive and significant relationship between CEO duality and EP, ROIC and Tobin's *Q*, indicating that powerful CEOs use their influence to improve firm efficiency by shaping organisational policies that increase shareholder value. This finding is consistent with previous research by Haniffa and Hudaib (2006), Mollah and Zaman (2015) and Correa and Lel (2016). However, the interaction between SOPFOR and CEO duality shows a contrasting effect, with a negative impact on Tobin's *Q* across Panels D, E, G and H, and a positive effect on ROIC in Table 5.

Another measure of CEO power, CPS, shows a positive correlation with ROIC and Tobin's *Q*, but a negative association with EP in Table 4. This mixed pattern leads to an inconclusive assessment of Hypothesis 3c regarding the role of CEO power in enhancing firm efficiency.

Additionally, the coefficient for CCI shows a positive and significant relationship in Tables 4 and 5 but a negative and significant relationship in Table 6 at the 5% level. This suggests that Tobin's *Q* may not fully reflect managerial efficiency. This finding is consistent with Bozec, Dia, and Bozec (2010) and Jermias and Gani (2014), who found a positive relationship between CCI and firm performance. Thus, Hypothesis 3d, which proposes that SOP enhances firm efficiency through CCI, is supported.

In contrast, the impact of ACI on ROIC, as shown in Table 5, reveals a negative and significant relationship, indicating that ACI may play a limited role in improving firm efficiency because of potential suboptimal capital allocation decisions (Salama and Putnam 2013). Therefore, Hypothesis 3e, which suggests that SOP's effectiveness is amplified through ACI, is also supported by the data.

Lastly, ownership concentration shows a negative and significant relationship with EP and ROIC at the 1% level in Tables 4 and 5. This contrasts with Correa and Lel (2016), who argued that concentrated institutional ownership enhances firm performance. Consequently, Hypothesis 3f, which posits that SOP improves firm efficiency through higher ownership concentration, is refuted. However, the interaction between SOPFOR and ownership concentration shows a positive and significant impact on ROIC in Table 5 across Panels D, F, G and H, indicating a potentially positive effect on firm efficiency.

Theoretically, the relationship between SOP and firm efficiency is best understood through a comprehensive theoretical framework that integrates agency theory and its key extensions—optimal contract theory and managerial power theory. Agency theory forms the foundational basis of this framework and posits that there is an inherent conflict between the interests of shareholders (principals) and executives (agents), as executives may prioritise personal gain over shareholder value (Jensen and Meckling 1976). SOP, as a governance mechanism, seeks to mitigate this conflict by giving shareholders a direct voice in approving executive compensation, thereby aligning the incentives of executives with the interests of shareholders (Conyon and Sadler 2010).

Optimal contract theory, an extension of agency theory, suggests that executive compensation should be structured in a way that effectively aligns the interests of managers with those of shareholders. According to this theory, SOP plays a critical role in this alignment by ensuring that compensation packages are scrutinised and approved by shareholders, thus promoting contracts that incentivise executives to improve firm efficiency and create long-term value (Bebchuk and Fried 2003). From this perspective, SOP can significantly enhance firm efficiency by reducing agency costs, as it encourages the design of compensation packages that reward executives for achieving performance goals that benefit shareholders (Edmans and Gabaix 2016).

However, the effectiveness of SOP in enhancing firm efficiency is not guaranteed and depends heavily on the broader corporate

governance context. Managerial power theory provides a contrasting view by highlighting the potential limitations of SOP in environments where CEOs hold significant influence over the board of directors. In such cases, even with SOP in place, the power dynamics may allow CEOs to secure favourable compensation packages that do not necessarily align with shareholder interests (Bebchuk, Fried, and Walker 2002). This theory suggests that the effectiveness of SOP is contingent upon the strength and independence of the board, as well as the presence of robust CGMs that can counterbalance managerial power (Core, Holthausen, and Larcker 1999).

Moreover, the impact of SOP on firm efficiency is also influenced by CEO characteristics, such as experience, tenure and personal traits. For instance, a CEO with a strong track record and substantial tenure might have more influence over the board, potentially weakening the effectiveness of SOP (Finkelstein 2009). Conversely, CEOs who are relatively new or lack substantial power may be more responsive to the incentives aligned through SOP. This interplay between CEO characteristics and corporate governance structures further complicates the relationship between SOP and firm efficiency (Hambrick and Mason 1984; Westphal and Zajac 1995).

Overall, although SOP has the potential to enhance firm efficiency by aligning executive incentives with shareholder interests, its actual effectiveness is highly dependent on the broader corporate governance environment and the specific characteristics of the CEO. An integrated theoretical approach that considers these variables provides a more comprehensive understanding of how and when SOP can be an effective tool for improving firm performance. This perspective emphasises the importance of context—particularly the governance structures and power dynamics within a firm—in determining the success of SOP as a mechanism for enhancing firm efficiency (Cai and Walkling 2011; Alissa 2015).

3.5.4 | Robustness Test

To ensure the robustness of our findings, we conducted an additional analysis using the limited information maximum likelihood (LIML) estimator. The LIML estimator, developed by Anderson and Rubin (1949, 1950), is designed to address classical simultaneous equation problems (Akashi and Kunitomo 2012). Bascle (2008) highlights several advantages of the LIML estimator. First, it provides an unbiased median, meaning the median of its sampling distribution closely approximates the population parameter. Second, LIML remains unbiased even when dealing with weak instruments. Third, LIML is more efficient than the two-stage least squares (2SLS) estimator when there are many instrumental variables (Bascle 2008; Wansbeek and Prak 2017).

After performing the LIML estimation, we examined the validity of the instruments using the Anderson–Rubin (AR) test, which checks for over-identifying restrictions. A significant AR test value indicates either problematic instruments or misspecified structural equations. Additionally, the *F*-statistic yields a *p* value below 0.10, indicating no evidence of weak instruments—consistent with the results of the minimum eigenvalue statistic test.

We supplemented these findings with un-tabulated data, which confirmed the similarity of results and consistency of signs among the primary explanatory variables observed in Tables 4, 5 and 6.

4 | Conclusion and Implications

This study was motivated by the evolving landscape of SOP regulations, including significant developments like the two-strike rule in Australia and mandatory binding votes in the UK. Employing rigorous empirical methods, such as unbalanced pooled panel regression models and the IV-GMM estimator, our analysis reveals that SOP votes positively impact various dimensions of firm efficiency, including economic, business and market performance. This positive effect is likely driven by changes in executive behaviour in response to SOP votes, with CEOs becoming more attentive and responsive to shareholder interests, thereby enhancing overall firm efficiency.

Our research advances the existing literature in several keyways. First, we utilise distinctive performance indicators, namely EP and ROIC, as proxies for firm efficiency, providing a more comprehensive assessment of a firm's capacity to generate value from its invested capital. Second, we explore the moderating effects of CGMs on the effectiveness of SOP, with a particular focus on power distribution dynamics within firms. Unlike previous studies (e.g., Ferri and Maber 2013; Cuñat, Giné, and Guadalupe 2016; Correa and Lel 2016) that primarily examined the direct impact of corporate governance on firm performance, our study investigates how these mechanisms interact with SOP to influence firm efficiency. Third, we further explore the role of CEO personal attributes, such as age and gender, in shaping firm efficiency and their potential to moderate the effectiveness of SOP.

Our findings indicate that younger CEOs are more effective in enhancing firm value, which ultimately benefits shareholders. Younger executives tend to adopt more aggressive growth strategies compared with their older counterparts, significantly influencing the company's strategic direction and decision-making processes (Adhikari et al. 2015). However, our results regarding CEO gender and its impact on firm efficiency remain inconclusive, suggesting a need for further research in this area. Additionally, our analysis points to potential weaknesses in board dynamics, particularly in the monitoring efficiency of the board, which may be compromised because of poor communication and coordination among board members. Independent directors, who are expected to play a critical role in overseeing top management, appear to have a less significant impact, raising concerns about their effectiveness in corporate governance.

The implications of this research are significant for shareholders, boards and policymakers. First, when assessing firm efficiency, it is essential to consider ROIC and EP alongside traditional measures like Tobin's *Q*, as these indicators together offer a more holistic view of a company's ability to utilise its capital effectively. Second, the effectiveness of SOP votes may be undermined by the quality of CGMs, particularly the role and influence of outside directors. Third, policymakers should

be aware that while SOP regulations can enhance executive accountability, their success is contingent on the broader governance context within which they are implemented.

In terms of limitations, this study focuses on Anglo-Saxon economies, excluding New Zealand, which may limit the generalizability of our findings to other cultural and regulatory environments. Future research could expand the scope by comparing the impact of SOP regulations in Anglo-Saxon countries with that in non-Anglo-Saxon countries such as Germany, Japan, Spain and South Africa, which have also implemented SOP regulations. Such comparative studies could provide deeper insights into the global applicability and effectiveness of SOP mechanisms, further enriching our understanding of the role of corporate governance in different economic contexts.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

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

Endnotes

[1] Say-on-pay refers to a corporate law provision that grants shareholders the authority to vote on a company's executive compensation and related policies. This encompasses decisions on executive pay packages, equity awards, and the company's overall compensation strategy (Joura, Xiao, and Ullah 2023).

[2] New Zealand was excluded due to the limited availability of data on SOP votes, which made it challenging to include the country in a robust and comprehensive analysis.

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