

Alduais, Fahd

Article

Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape

Cogent Economics & Finance

Provided in Cooperation with:

Taylor & Francis Group

Suggested Citation: Alduais, Fahd (2023) : Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 11, Iss. 2, pp. 1-36, <https://doi.org/10.1080/23322039.2023.2254589>

This Version is available at:

<https://hdl.handle.net/10419/304202>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape

Fahd Alduais

To cite this article: Fahd Alduais (2023) Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape, Cogent Economics & Finance, 11:2, 2254589, DOI: [10.1080/23322039.2023.2254589](https://doi.org/10.1080/23322039.2023.2254589)

To link to this article: <https://doi.org/10.1080/23322039.2023.2254589>



© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 05 Sep 2023.



[Submit your article to this journal](#)



Article views: 1803



[View related articles](#)



[View Crossmark data](#)



Citing articles: 6 [View citing articles](#)



Received: 24 February 2023
Accepted: 30 August 2023

*Corresponding author: Fahd Alduais,
Department of Accounting,
Philadelphia University, Jarash Road,
20 KM, Amman 19392, Jordan
E-mail: falduais@philadelphia.edu.jo

Reviewing editor:
David McMillan, University of Stirling,
UK

Additional information is available at
the end of the article

FINANCIAL ECONOMICS | RESEARCH ARTICLE

Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape

Fahd Alduais^{1*}

Abstract: This research explores the relationship between a company's commitment to Environmental, Social, and Governance (ESG) factors and its capital equity cost (COE) in the Chinese market. Using statistical methods like regression analysis, the study aims to uncover how ESG disclosure relates to COE. Key findings reveal that environmental and social disclosures increase capital equity costs, indicating higher costs for companies with strong ESG practices. However, governance disclosures don't significantly impact COE, suggesting that environmental and social aspects carry more weight in shaping investor perceptions and influencing costs compared to governance. The research also shows that this ESG-COE link is more significant for financially sound companies, indicating greater cost implications for strong performers. The study further demonstrates that strong ESG practices are perceived as lower risk, leading to lower capital equity costs. Chinese firms with high ESG scores tend to have lower capital costs, indicating rising investor appreciation for ESG in the Chinese market. The study's robustness check supports these findings, reinforcing the growing importance of ESG in investment decisions. This research has implications for companies, investors, and policymakers, stressing the role of ESG in attracting investment and reducing costs. Policymakers can use these insights to encourage improved ESG practices and transparency. Overall, the study underscores ESG's impact on capital equity costs in China, offering valuable insights for decision-makers and highlighting ESG's relevance in financial choices.

Subjects: Sustainable Development; Environmental Economics; Business, Management and Accounting

Keywords: ESG rating score; cost of capital; firm performance; investment decisions; transparency

1. Introduction

In recent years, the significance of Environmental, Social, and Governance (ESG) factors has garnered widespread recognition as crucial components of both social and economic progress (Aboud & Diab, 2019; Al Amosh & Khatib, 2021; Almeyda & Darmansyah, 2019; Brogi & Lagasio, 2019; Clementino & Perkins, 2021; Ionescu et al., 2019; Landi & Sciarelli, 2019; Linnenluecke, 2022; Sila & Cek, 2017). Businesses increasingly recognise the importance of ethical and sustainable practices in their operations, striving to achieve goals beyond profit maximisation (Nirino et al.,

2020). This shift in priorities has prompted a reconsideration of traditional business models and a focus on maintaining the delicate balance of the environment (Bocken & Short, 2021; Gregurec et al., 2021; Snihur & Bocken, 2022). The integration of social responsibility and eco-friendly initiatives into a company's strategy reduces potential risks and elevates its long-term value (Alsayegh et al., 2020).

Moreover, companies at the forefront of sustainability reap numerous advantages, including a bolstered reputation for the organisation (Nirino et al., 2021), elevated employee productivity, streamlined operations, and strengthened associations with regulatory bodies, society, and all stakeholders. On the whole, sustainable practices enable organisation to secure their market position and attract a greater number of investment opportunities than those that don't embrace sustainability. This has led investors to prioritise incorporating ESG criteria into their investment strategies (Cesarone et al., 2022; Ramirez et al., 2022; Yesuf & Aassouli, 2020). To determine the appropriate financing approach and sustainable decision-making, a company's capital cost must be considered (Ramirez et al., 2022; Atan et al., 2018; Dhaliwal et al., 2014; Nazir et al., 2022). In an effort to lower their COE, firms are devising sustainability-focused strategies (Ramirez et al., 2022). In line with this new emphasis, businesses are adapting their models to account for the environmental impact and preserve its delicate balance (Franceschelli et al., 2019).

The disclosure of ESG information has become increasingly critical in evaluating the impact ESG issues have on corporate image, reputation, competitiveness, and investment decisions (Albarrak et al., 2019; Raimo et al., 2021). Investors may use ESG disclosures as a tool to gauge management quality and assess the opportunities, risks, transparency, and future prospects of the companies they invest in (Raimo et al., 2021; Tamimi & Sebastianelli, 2017). Ultimately, the growing emphasis on ESG signifies a transformation in the way businesses conduct their affairs and the objectives they pursue. Disclosing information can improve investor understanding of the enterprise, decrease information asymmetry, increase investment risk sharing, and lower the COE (Alduais, 2016, 2019; Alduais et al., 2022; Bhattacharya et al., 2003; Chen et al., 2014; Francis et al., 2004; Li et al., 2017).

In non-financial disclosure, research has shown that companies that disclose information about their ESG practices have better financial performance and are more attractive to investors (Dahlsrud, 2008), which encourages investors to pay a premium for securities of companies with strong ESG (Buerthey et al., 2020; Changar & Atan, 2021; Cheng et al., 2016; Chouaibi & Zouari, 2022). Additionally, non-financial disclosure can help companies manage their reputations and build trust with stakeholders (Nirino et al., 2021). However, there is still a lack of standardisation in the reporting of non-financial information, which can make it difficult for stakeholders to compare the performance of different companies (Allen et al., 2017; Zsóka & Vajkai, 2018). Companies that adopt sustainable practices and prioritise ESG considerations often have a more positive impact on the world, which can lead to increased reputation, customer loyalty, and employee satisfaction. Moreover, sustainable companies can also benefit from cost savings through the reduction of waste, energy, and resource use, as well as from the creation of new business opportunities.

This research endeavours to close the knowledge gap surrounding the correlation between a firm's COE and its sustainability performance. By thoroughly examining various influencing factors, the study strives to offer a comprehensive comprehension of the interplay between these crucial financial metrics. The COE is an essential gauge of a company's financial well-being, symbolising the return demanded by investors to offset the risk they assume by investing in the company. Conversely, sustainability performance is a growingly critical evaluation of a company's long-term viability, incorporating ESG aspects. Literature suggests that industry affiliation and national-level elements such as stakeholder disposition, financial openness, ownership structure, and governance play a substantial role in the association between COE and sustainability performance (Al Amosh & Khatib, 2021; Dhaliwal et al., 2014; El Ghouli et al., 2011; Wu et al., 2022).

While there is a growing body of literature on the association between a firm's sustainability performance and its COE, there are still research gaps that need to be addressed. Specifically, the following research gaps are currently missing: The need to examine the comprehensive relationship: Existing research has primarily focused on the individual dimensions of sustainability, such as environmental sustainability, corporate social responsibility (CSR), or governance, and their impact on the COE. However, there is a need to explore the comprehensive relationship between financial and non-financial sustainability performance and the COE. This study aims to fill this gap by considering both financial and non-financial sustainability performance in assessing the association with the COE. The role of accounting financial performance as a moderator: While previous studies have examined the impact of sustainability performance on the COE, limited attention has been given to the potential moderating effect of accounting financial performance. This study aims to explore whether accounting financial performance acts as a moderator in the relationship between sustainability performance and the COE. Inconsistencies in findings: Existing research has produced mixed results regarding the association between sustainability performance and the COE. Some studies have found a positive association, others have found no significant association, and some have found a negative effect. These inconsistencies in the findings suggest the need for further investigation and analysis to better understand the complex interplay between sustainability performance and the COE.

To address these research gaps and provide a comprehensive understanding of the relationship between sustainability performance and the COE, this study aims to: Examine the comprehensive association between financial and non-financial sustainability performance and the COE: By considering both financial and non-financial dimensions of sustainability, this study seeks to provide a more holistic understanding of how sustainability performance influences the COE. It will explore whether companies with strong sustainability performance experience lower or higher COE compared to those with weaker sustainability performance. Investigate the role of accounting financial performance as a moderator: This study aims to explore the potential moderating effect of accounting financial performance on the association between sustainability performance and the COE. It will examine whether the impact of sustainability performance on the COE varies depending on the level of accounting financial performance. Address the inconsistencies in findings: This study seeks to contribute to the existing literature by conducting a robust analysis to understand the inconsistencies in findings regarding the association between sustainability performance and the COE. By considering various factors and potential moderating effects, the study aims to provide insights into the underlying mechanisms and conditions that influence the relationship.

By addressing these research gaps and answering the research questions, this study aims to provide valuable insights for both practitioners and policymakers. The findings will contribute to a better understanding of the relationship between sustainability performance and the COE, allowing businesses to make informed decisions regarding their sustainability strategies and investors to consider ESG factors in their investment decisions. Additionally, the study's findings can inform policymakers in developing regulations and frameworks that promote sustainable practices and encourage companies to disclose their sustainability performance effectively. In summary, this study aims to bridge the existing research gaps by examining the comprehensive association between sustainability performance and the COE, considering the moderating effect of accounting financial performance, and addressing the inconsistencies in findings. The insights generated from this study will contribute to the growing body of knowledge on the interplay between sustainability performance and financial metrics, providing guidance for businesses, investors, and policymakers in their decision-making processes.

Based on the objectives of the study, the following research questions will guide the investigation: How does sustainability performance, encompassing both financial and non-financial dimensions, relate to the cost of equity (COE)? Does a stronger sustainability performance lead to a lower or higher COE? Does accounting financial performance moderate the relationship between

sustainability performance and the COE? How does the impact of sustainability performance on the COE vary depending on the level of accounting financial performance? What are the underlying mechanisms and conditions that influence the association between sustainability performance and the COE? How do industry affiliation, stakeholder disposition, financial openness, ownership structure, and governance factors affect this relationship? What insights can be gained from a robust analysis to address the inconsistencies in findings regarding the association between sustainability performance and the COE?

By addressing these research questions, this study aims to shed light on the relationship between sustainability performance and the COE, provide insights into the moderating effects of accounting financial performance, and offer a comprehensive understanding of the underlying mechanisms and conditions influencing this association.

The study stems from the idea of stakeholder theory, which believes in considering all parties that may be affected by business decisions. Furthermore, the study draws inspiration from previous research that demonstrates how both financial and non-financial information can impact the COE (Dhaliwal et al., 2011; Ng & Rezaee, 2015), as well as improve capital market efficiency by narrowing the gap in information (Li et al., 2017). Additionally, the study is informed by two separate lines of research that explore the correlation between a company's sustainability performance and its COE. According to earlier studies (Atan et al., 2018; Dahiya & Singh, 2020; Nazir et al., 2022), ESG affects COE positively. Despite some studies finding a positive association between these factors and capital costs (Orlitzky et al., 2003), others have found no significant association (e.g., Deegan et al., 2002). And others found a negative effect, such as (Ng & Rezaee, 2015). A company's COE can be lower by reducing estimation risk in the capital markets by better disclosing ESG practices. Theoretically, ESG disclosure and the COE should be positive, but more research is needed to confirm this.

The current study delves into the association between financial and non-financial sustainability performance and the COE. Unlike previous research that focused on sustainability's financial performance (Ng & Rezaee, 2015), this study takes a closer look at accounting financial performance as a moderator. The study seeks to determine if the COE is influenced by financial or non-financial sustainability performance or a combination of both. Prior research has only explored the impact of single sustainability dimensions, such as environmental sustainability, CSR, or governance, on capital equity cost (Cheng et al., 2016; Dahiya & Singh, 2020; Dhaliwal et al., 2014; Goss & Roberts, 2011; Kuo et al., 2021; Reverte, 2009; Tang, 2022a). However, this study builds upon these findings by using a more comprehensive ESG score that takes into account multiple ESG dimensions. The results indicate that a ESG factors with respect to company's performance can have an impact on the COE. The association between ESG and the COE is influenced by the overall performance of the company and the interaction between various dimensions of sustainability. It is important for companies to prioritize ESG and for investors to consider ESG factors when making investment decisions. Further research is needed to fully understand the complex interplay between ESG and the COE.

The study offers two innovative contributions. Firstly, it examines how corporate performance affects the association between ESG and the COE. Secondly, the study employs a robustness check analysis of performing and non-performing firms to counteract possible homogeneity issues in estimated models, yielding more trustworthy and reliable results compared to prior research. In a world where economies are increasingly interwoven, owners, investors, and shareholders must have an understanding of the capital costs they face. Policymakers and decision-makers need to be aware of the association between knowledge and business, as it is pivotal to their investment and risk management choices (Huang et al., 2022; Shanyu, 2022).

This paper come out of the following structure: The next section discusses The prior studies, hypotheses development, and the following section present the research methodology. The fourth section explains empirical results. The fifth section show the discussion and the sixth indicates the implication. Finally, the paper is concluded with the conclusion.

2. Literature review

2.1. Background of the study

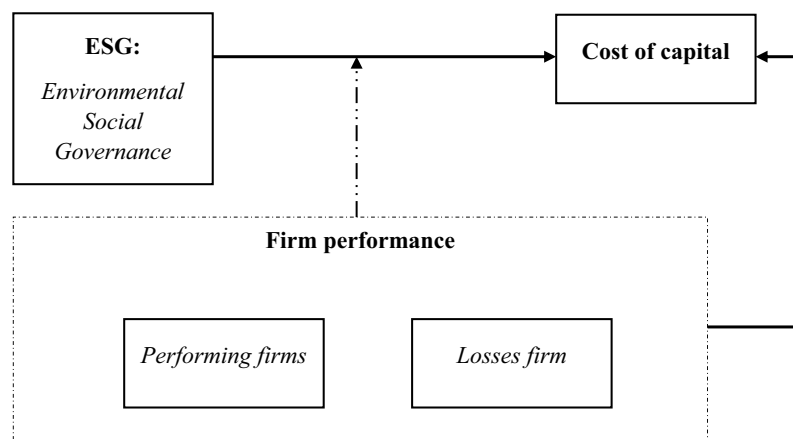
The association between ESG disclosure and the COE has been explained using several theories, including the stakeholder theory, the signalling theory, the risk management theory, the fundamental theory, and the agency theory. According to the stakeholder theory, companies that prioritise ESG and sustainable earnings may be more attractive to investors and create long-term value for stakeholders (Freeman, 1984). The signalling theory suggests that ESG disclosure can be used to signal to investors that a company is well-managed and has a strong governance structure, leading to a lower risk profile and lower COE (Ross, 1973; Zhai et al., 2022), and companies that have superior environmental performance may use environmental disclosure as a way to differentiate themselves from poor performers. For example, by providing credible information about their environmental performance, these companies can signal to investors that they are doing better in terms of environmental practices and management compared to their peers (Connelly et al., 2011; Dahiya & Singh, 2020; Luo & Tang, 2014).

The risk management theory suggests that companies with strong ESG may be better equipped to manage environmental and social risks, leading to a lower COE (Orlitzky et al., 2003). A fundamental theory states that the market rewards companies with positive ESG performance, while punishing those with negative ESG performance. Therefore, a higher level of transparency reduces asymmetry of information and lowers capital costs (Pindyck, 1988). The agency theory suggests that increased transparency and disclosure can help align the interests of management and shareholders and reduce the COE. Other research has also supported the idea that increased transparency can improve investor relations and lead to a lower COE (Alsayegh et al., 2020). An example of such research is a study by (Bekaert et al., 2009), which found that investors reward companies that disclose more data for increasing transparency; the capital cost will be lower. Companies can reduce the information asymmetry between themselves and investors, leading to increased investor confidence and trust and, ultimately a lower COE (Alduais, 2022; Alduais et al., 2022; Kothari et al., 2009). Other studies have also supported this theory, suggesting that increased transparency can lead to improved investor relations, sustainable growth of the company and a lower COE (Beattie et al., 2006; Lopez et al., 2022).

2.2. The current study

The conceptual framework presented in Figure 1 delves into the interplay between a company's ESG standing and its COE. It suggests that firms with strong ESG credentials may enjoy lower capital costs, while their financial performance may strengthen or weaken this association. This intriguing framework proposes a direct link between ESG and the COE, with financial performance acting as a potential moderator. In essence, the study highlights the impact a company's ESG can have on its COE and the role of firm performance in shaping this connection.

Figure 1. Conceptual framework.



Firms with impressive ESG scores often boast improved performance and more negative capital costs, yet the correlation between the two may hinge on the company's financial standing. Companies that are thriving may experience a tighter connection between their ESG credentials and COE, while those struggling may have a weaker association. The ESG components can sway a company's financial performance and risk perception, which, in turn, affects investment decisions and capital costs. The study implies that ESG factors can shape financial outcomes, impacting the COE, with well-performing companies likely to incur lower costs and underperforming companies facing higher costs.

A burgeoning body of literature has emerged on the interconnection between environmental exposure and the COE, but the nature of this association remains a topic of considerable discussion and ambiguity. A number of studies have revealed that companies that are forthcoming about their environmental practices may benefit from a lower COE as a result of their environmental disclosure. On the other hand, some studies have found a conflict or even no association at all. Additionally, research examining the impact of excellent sustainability practices on debt cost suggests that firms with superior environmental management systems have noticeably smaller credit spreads, resulting in lower debt costs (Bauer & Hann, 2010). However, companies grappling with significant environmental challenges face significantly higher loan interest rates (Goss & Roberts, 2011). While prior studies have explored the association between non-financial exposure and the COE, the correlation between ESG and the COE has been comparatively under-researched (Albarrak et al., 2019; Ng & Rezaee, 2015). However, ESG disclosure is becoming increasingly critical in acknowledging the impact of ESG factors on a company's image, reputation, competitive advantage, and investment decision-making (Albarrak et al., 2019). Investors may view ESG disclosure as a measure of management quality and a means of assessing companies' opportunities, risks, transparency, and future performance (Tamimi & Sebastianelli, 2017; Zhai et al., 2022). Despite the theoretical support for a positive association between ESG disclosure and the COE, further research is necessary to fully comprehend this association.

2.3. Exploring ESG's impact on capital costs

The impact of environmental disclosure on the COE has been studied extensively. In the US, a positive effect has been found for firms that voluntarily disclose environmental information and publish environmental reports (Plumlee et al., 2015). The association between environmental disclosure and capital cost in China is more complex and depends on the disclosure quality (Shen & Lin, ; Wu, 2014; Yan et al., 2022). Moreover, the association is more likely to be negative in countries with a dominant stakeholder orientation (Dhaliwal et al., 2014). Variations in findings may result from differences in measurement, controlling for endogeneity, evaluation location (Brooks & Oikonomou, 2018), and regulation intensity (Yan et al., 2022).

A study by (Li et al., 2017) indicated that environmental disclosure is significantly associated with a lower capital cost for companies listed on the Shanghai and Shenzhen stock exchanges A-share listed companies. Similarly, a finding by (Chen et al., 2014) suggests that by disclosing environmental accounting information, companies can help reduce the errors made by investors when estimating the COE financing, ultimately resulting in a reduced COE for the firm (Iatridis, 2013). discovered that environmental information disclosure can impact investor perception, with higher quality information disclosure and internal management leading to lower barriers for the enterprise to access the capital market and a higher financing level than similar companies with low-quality environmental information disclosure. Furthermore, the studies by (El Ghoul et al., 2011; Garzón-Jiménez & Zorio-Grima, 2021; Gupta, 2018) found evidence of a negative association between environmental disclosures and COE (COE) with statistical significance. This means that the results of these studies suggest that companies that engage in environmental disclosures are likely to have a lower equity cost than companies that do not make these disclosures. The reasons may be attributed to factors such as improved investor confidence, a better reputation, and a stronger brand image.

The COE may decline for companies that make pro-environmental disclosures in countries where stakeholders take priority (Aerts et al., 2008; Dhaliwal et al., 2014). The efficiency of a country's legal system plays a vital part in this association. In an ineffective legal system, environmental disclosures may not be credible, leading to companies with visible environmental risks using these disclosures to enhance their social image (Albring et al., 2016; Ren & Hong, 2018), leading to a higher COE due to higher environmental risks (Aintablian et al., 2007). A study by (Fang & Guo, 2018) revealed that the COE for heavily polluting firms in China remained unchanged after negative environmental news as the cost of breaking environmental and accounting regulations was low in China (Kock et al., 2012). posited that environmental information disclosure has a delayed effect on equity capital cost. Companies with poor environmental records may initially experience negative returns from environmental information disclosure, but those with sound environmental practices can reap positive returns in the long run.

Study by (Fandella et al., 2023) provides empirical evidence supporting the notion that CSR performance, as measured by ESG scores, can influence the cost of capital. The findings highlight the importance of considering CSR activities and disclosure in financial decision-making, as they can have a positive impact on a company's cost of equity and overall cost of capital. According to the study by (Ramirez et al., 2022), the results indicated that the association between environmental pillar scores and COE is not statistically significant. Therefore, the study found no correlation between environmental performance and capital costs. However, this finding is consistent with some prior literature that has also found limited evidence of a strong association between environmental performance and the COE. The findings of these studies highlight the potential benefits of environmental disclosures for companies, including lower COE. However, further research and analysis are needed to better understand the association between environmental disclosures and financial performance.

We posit that companies with higher environmental scores, reflecting stronger environmental, social, and governance (ESG) practices, will experience a lower COE. This is based on the premise that companies with robust environmental practices are likely to be perceived as more sustainable, less risky, and better equipped to navigate environmental challenges, which can enhance investor confidence. As a result, such companies may enjoy a cost advantage in attracting capital, leading to a reduced COE. Previous studies have shown mixed results concerning this association, particularly in the Chinese business landscape, where the relationship is influenced by the quality of disclosure and regulatory context. Nevertheless, we anticipate that our investigation will provide empirical evidence to shed light on the relationship between environmental practices and COE in the context of Chinese firms. As result, Hypothesis 1a (H1a) as following:

H1a. There is a negative association between the environmental score and the COE.

In addition, numerous studies have examined the association between non-financial disclosure and the COE for firms such as (Heflin et al., 2016; Lambert et al., 2007). According to (Li et al., 2017, 2015; Xu et al., 2015), companies with high corporate social responsibility (CSR) ratings tend to have a notably lower equity capital cost. A study by (Richardson & Welker, 2001) found that social disclosures are positively correlated with COE, and the effect could be mitigated by firms that are performing better financially (Dhaliwal et al., 2011; El Ghouli et al., 2011). have shown a negative association between CSR disclosure and performance with the COE. Furthermore (Dhaliwal et al., 2014), discovered that CSR has a negative effect on the COE. The impact is stronger in countries that prioritise stakeholder interests. The study also shows that financial and CSR disclosures complement each other in lowering the COE.

We hypothesize that companies with higher social scores, indicative of better corporate social responsibility (CSR) practices, will have a lower COE. Robust CSR practices may signal a company's

effective management of stakeholder relationships and responsible behavior, thereby fostering a positive reputation and greater investor confidence. As a result, investors may perceive such companies as lower-risk investments, leading to a lower COE. However, it is essential to consider the nuances of the Chinese business landscape, where the impact of CSR on COE may be influenced by regulatory environments, cultural factors, and stakeholder preferences. By investigating this relationship, we aim to contribute valuable insights into the role of CSR in shaping the cost of equity for Chinese firms. As a result, CSR disclosure may indicate that stakeholder associations are managed well in these countries, which may result in lower COE (Reverte, 2009). Accordingly, Hypothesis 1b (H1b) can be summarised as follows:

H1b. There is a negative association between the social score and COE.

The association between corporate governance (CG) and the COE is an important one (Abu Alia et al., 2022; Dhaliwal et al., 2011; El Ghouli et al., 2011, 2018; Kuo et al., 2021). In general, good corporate governance practices, such as transparency, accountability, and effective management, can help lower a company's COE by increasing investor confidence and reducing the perceived risk of investing in the company (Alduais et al., 2022; Erragragui, 2018; Gerged et al., 2021). A majority of the existing literature focuses on the influence of ESG disclosure on company performance or how company performance may be influenced by one of the ESG pillars (Brooks & Oikonomou, 2018; Cek & Eyupoglu, 2020; Dahiya & Singh, 2020; Eichholtz et al., 2019; Taliento et al., 2019), argue that social and governance pillars generate long-term shareholder value and positively impact a company's performance (Bhaskaran et al., 2020). A recent study by (Paolone et al., 2022) found that the governance pillar has a much greater impact on a company's market performance than its other two pillars. Many studies address the association between financial performance and market value, while others investigate how ESG impacts COE.

Additionally, poor corporate governance practices can increase the COE by decreasing investor confidence and increasing the perceived risk of investing (Alduais et al., 2023; Leuz et al., 2009). Thus, it is important for companies to focus on improving their corporate governance practices to reduce capital cost and attract more investment (Alduais et al., 2023). Many studies have investigated the impact of corporate governance practices on the COE and found that companies with higher governance scores tend to have lower costs of capital (El Ghouli et al., 2011; Hail & Leuz, 2006; Reverte, 2009, 2012; Xu et al., 2015). This is because a high governance score signals to investors that the company has strong corporate governance practices and accountability, which can increase investor confidence and reduce the capital cost. Transparency in ESG practices can also positively affect the COE, as demonstrated by (Dhaliwal et al., 2014), who found that companies with high levels of non-financial disclosure tend to have a lower COE, indicating that such transparency is viewed as a sign of good governance and is therefore favoured by investors.

However, a low governance score signals weak corporate governance practices and accountability, which can decrease investor confidence and increase the capital cost. Moreover, companies that prioritise sustainability and transparently communicate their efforts to investors may have a lower COE. This is because increased transparency and sustainability practices attract more investors, who can share in the risk and contribute to a decrease in COE. This highlights the importance of firms not just for the planet, but for their own financial success. By embracing sustainable business practices, companies can benefit the environment and society and boost their bottom line.

We postulate that companies with higher governance scores, indicating superior corporate governance practices, will experience a lower COE. Sound corporate governance practices, such as transparency, accountability, and effective management, are expected to instill investor

confidence and reduce perceived investment risk. Consequently, investors may demand a lower return on investment for companies with strong governance, leading to a reduced COE. However, we acknowledge that the association between governance and COE may vary depending on factors such as industry characteristics, regulatory environments, and the overall quality of corporate governance in the Chinese market. By exploring this relationship, we aim to contribute insights into the significance of governance practices in influencing capital costs for Chinese companies. As a consequence, Hypothesis 1c (H1c) is as follows:

H1c. There is a negative association between the governance score and COE.

2.4. The moderating effect of firm performance

The association between non-financial disclosure and firm performance is further influenced by stakeholder engagement, as noted by (Deegan et al., 2002). They found that companies with high levels of stakeholder engagement tend to have a stronger positive association between non-financial disclosure and sustainable performance. This highlights the role stakeholders can play in driving companies towards prioritising sustainability. Furthermore, the COE, a key factor in a company's ability to raise capital, is influenced by several factors, including financial performance, estimated risk levels, and stakeholder engagement. Firm risk is estimated using parameters such as the beta factor, which is determined based on historical stock returns (Engle, 2018; Poshakwale & Courtis, 2005; Reverte, 2012; Serrano et al., 2017). Historically, companies that have shown a strong track record of sustainability may have lower beta factors, which can increase investor confidence and result in a lower risk premium. Studies have also shown that a company's sustainability practices can have a direct impact on its COE. For instance (Orlitzky et al., 2003), indicated that companies with good sustainability practices tend to have a lower capital cost, likely due to the reduced risk associated with such practices (Tang, 2022b). conducted a study that found companies with higher levels of ESG had a significantly lower COE compared to companies with lower ESG performance.

(Prasad et al., 2022) provide insights into the complex relationship between CSR, COC, and the influence of policy intervention. It underscores the importance of considering the signalling effect of mandatory CSR legislation on a firm's cost of capital, shedding light on the potential trade-offs and implications of CSR requirements in the corporate landscape. A strong track record of firm performance may moderate the association between ESG disclosure and COE, and companies with a strong track record of firm performance may receive a lower COE. Other studies have also indicated that the association between ESG disclosure and COE can be influenced by various factors, including industry, country, and the quality of the disclosure.

We propose that the impact of ESG practices on COE will be stronger for higher-performing firms. Companies with strong financial performance are likely to benefit more from improved investor perception associated with robust ESG practices. As these companies have a demonstrated track record of success, they may be perceived as more stable and attractive investment opportunities, leading to a more favorable impact on COE from their environmental disclosures. However, it is essential to consider potential endogeneity concerns and other factors that may influence this moderating effect. As a result, the following hypotheses are made:

H2a. There is a moderating impact of firm performance on association between the environmental score and COE.

We anticipate that the relationship between ESG practices and COE will be more pronounced for firms with poor performance. Such companies may seek to leverage responsible behavior and CSR practices to enhance their risk profile and improve investor confidence, thereby reducing their COE.

The potential for a stronger association between social practices and COE in firms with poor performance warrants investigation to better understand how ESG practices may act as mitigating factors in shaping capital costs.

H2b. There is a moderating impact of firm performance on the association between the social score and COE.

We hypothesize that the impact of governance practices on COE will be more significant for companies with strong financial performance. High-performing firms are likely to attract socially responsible investors who value strong corporate governance and transparency. As a result, these companies may experience a more favorable impact on COE from their governance practices. Investigating the moderating role of firm performance in the governance-COE relationship can provide valuable insights into the dynamics of capital costs for Chinese companies.

H2c. There is a moderating impact of firm performance on the association between the governance score and COE.

We propose that higher-performing companies will experience a more pronounced impact on COE from their ESG practices. As these companies are already successful, their ESG practices may further enhance their reputation and attract socially responsible investors seeking to align their investments with sustainable and responsible companies. This alignment can lead to a reduced COE for higher-performing firms. We hypothesize that firms with weaker financial performance will experience a greater influence on COE from their ESG practices. By improving their ESG scores and signaling responsible behavior, these firms may enhance their risk profile and investor perception, potentially leading to a reduced COE. Investigating the impact of ESG practices on COE for firms with poor performance can provide valuable insights into how sustainability efforts may contribute to their financial performance and attract investment.

H3a. The association between ESG components and COE is stronger for higher-performing firms.

H3b. The association between ESG components and COE is stronger for firms with poor performance.

3. Research methodology

3.1. Data collection

The Chinese government has launched a mandatory disclosure system for CSR information in 2008, resulting in an increase in the number of CSR reports. There are several major CSR rating agencies in China. The sample for this study was carefully curated to ensure accuracy and relevance, including all Chinese firms listed in the CSMAR and Wind datasets from 2012 to 2019 on Chinese stock markets (Shenzhen and Shanghai). The remaining factors were based on data in the CSMAR database, except for ESG, which we acquired from Wind (Chen et al., 2023). To eliminate any confounding variables, financial firms such as banks, insurance companies, and other diversified financial entities were excluded due to their vastly different capital structures and regulatory environment compared to other companies (Alduais et al., 2022; Jiang et al., 2011). Subsequent to these exclusions, the study's ultimate sample size comprised of 474 firms, with an exhaustive 8530 observations (firms-years) that covered of 8-years' time. The database used in the study meticulously analysed the association between ESG factors and the COE, considering the moderating role of firm performance. This comprehensive and well-considered sample provides a solid foundation for a meaningful analysis of the subject matter.

3.2. Dependent variable

The COE is the dependent variable in this paper, as illustrated in Table 1. According to (Dhaliwal et al., 2014; El Ghoul et al., 2018; Kim et al., 2019; Yi et al., 2020), COE is estimated. The objective is to analyse the association between the ESG, and the COE moderated by firm performance. The costs of equity are calculated based on the abnormal growth models of (Ohlson & Juettner-Nauroth, 2005) as employed by (Easton, 2004; Gode & Mohanram, 2003). The quest for ESG will be gauged with the help of a comprehensive ESG score, courtesy of the Wind database. We will delve deep into the three ESG elements to determine their impact, aligning our findings with established research. Our findings will illuminate the stock market's perception of a company's performance and its subsequent impact on the cost of capital equity. The COE is commonly estimated using the COE_{OJ} model (Ohlson & Juettner-Nauroth, 2005) and the COE_{PEG} model (Easton, 2004) with the calculation shown in an equation as following:

$$r_{PEG} = \frac{\sqrt{eps_2 - eps_1}}{P_0} \quad (1)$$

Where the PEG model calculates the COE (rPEG) using three key components—the forecast of earnings per share after one year (EPS1), the forecast of earnings per share after two years (EPS2), and the current stock price (P0). The calculation is contingent upon EPS2 being equal to or greater than EPS1.

Additionally, COE are measured using the OJ model. The formula is as follows:

$$= \frac{eps_1}{R_e} + \frac{eps_2 - eps_1 - R_e(eps_2 - eps_1)}{R_e(R_e - g)} \quad (2)$$

$$r_{OJ} = A + \sqrt{A^2 + \frac{eps_1}{P_0} \times \left[\frac{eps_2 - eps_1}{eps_1} - (\gamma - 1) \right]} \quad (3)$$

$$A = \frac{1}{2} \left[(\gamma - 1) + \frac{dps_1}{P_0} \right] \quad (4)$$

$$\gamma = \lim_{t \rightarrow \infty} \frac{eps_{t+1}}{eps_t} \quad (5)$$

Where, P0 refers to the stock's closing price on the day of trading calculated using the closing price for the estimated year June 30 of the following year. Dps1 is the forecasted dividend per share for the first year, calculated as eps1 times the dividend payment rate (k), using the sample company's average payout ratio. $\gamma-1$ is the long-term growth rate of earnings per share

3.3. Independent variables

ESG disclosure refers to the practice of publicly disclosing information related to environmental, social, and governance practices of the company. This information can include details about the company's environmental impact, labour policies, community involvement, and governance practices. The ESG is measured by various metrics, including the overall ESG score and its components, which are considered the study's most significant independent variables derived from wind, as illustrated in Table 1. The literature provides a variety of approaches for assessing a company's ESG performance. The majority of existing studies utilise ratings or scores from third-party, such as Thomson Reuters, Bloomberg, Wind, Hexun and Sino-Securities Index ESG Evaluation such as (Alduais et al., 2022; Atan et al., 2018; Cesarone et al., 2022; Fazzini & Dal Maso, 2016;

Gonçalves et al., 2022; Hamrouni et al., 2019; Li et al., 2018; Ramirez et al., 2022; Taliento et al., 2019).

3.4. Moderator variable

The choice of ΔROE_{t+1} as the moderator variable in the association between ESG and the COE reflects an interest in understanding the role that changes in future return on equity (ROE) play in shaping the association between ESG and the COE. ROE is a commonly used measure of a company's profitability and efficiency, and changes in ROE over time can provide insights into a company's performance. Using the change in ROE as a moderator, researchers can investigate whether the association between ESG and the COE is stronger or weaker depending on the change in ROE. For example, it could be that the association between ESG and the COE is stronger when ROE is increasing compared to when it is decreasing. This information can be valuable for understanding how ESG affects the COE and for identifying the conditions under which ESG has a more or less pronounced effect on the COE. In general, the choice of ΔROE_{t+1} as a moderator in this association can help to provide a more nuanced understanding of the association between ESG and the COE and can help to shed light on the role that changes in ROE play in shaping this association.

3.5. Control variables

Multiple regression models selected several factors related to COE: firm size (log of assets), growth (log of operating revenue), BETA (a measure of systemic risk), financial leverage (as a proxy for financial risk), operation risk (uncertainty of future business operations), profitability (indicator of investor decision-making), and total asset turnover (efficiency of asset use), as illustrated in Table 1. The study predicts a positive association between financial leverage and COE and a negative association between total asset turnover and COE.

3.6. Model specification

The study uses regression analysis to examine the association between ESG and COE. Data is collected, analysed with statistical software, and the results reveal the strength, direction, and statistical significance of the association. Results may show a significant negative association, meaning higher ESG scores lead to lower costs of capital and vice versa. GLS regression is employed. Equation 1 represents the general model.

$$K_{it} = \beta_0 + \beta_1 \Sigma ESG_{it} + \beta_2 SIZE_{it} + \beta_3 BTM_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \varepsilon_{it} \quad (6)$$

$$K_{it} = \beta_0 + \beta_1 \Sigma ESG_{it} + \beta_2 \Delta ROE_{it} + \beta_3 \Sigma ESG * \Delta ROE_{it} + \beta_4 SIZE_{it} + \beta_5 BTM_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + \varepsilon_{it} \quad (7)$$

4. Data analysis and results

4.1. Descriptive and correlation analysis

Table 2 provides an overview of crucial information regarding ESG disclosure, company performance, control variables, and COE. The statistics for all variables involved in the COE model are included. On average, Chinese firms have a higher implied COE estimate using the Easton model compared to the OJ model (5.8% compared to 5.79%) which supports previous findings (El Ghoul et al., 2011; Gonçalves et al., 2022).

Moreover, Chinese companies have an average environmental ESG score of 6.09, social ESG score of 6.60, and governance ESG score of 8.20, with a mean ESG score of 6.96. This mean score is in close proximity to the average ESG score of 6.707 reported in' (Chen et al., 2023)s study.

The correlation matrix presented in Table 3 and the calculation of variance inflation factors (VIF) were used to examine the existence of multicollinearity in the regression model. The

results indicate that multicollinearity was not found, as almost all the associations between variables are low. Additionally, most of the correlation coefficients between variables being lower than 0.5 suggest that the association between the variables is weak, indicating a low possibility of multicollinearity. This means that the independent variables in the model are not likely to have a high degree of correlation with one another, which is a good indication for the validity of the model.

4.2. Regression analysis

The coefficient in a regression model shows the association between the independent variable (COE) and dependent variable (components of ESG). It measures the impact of a unit change in the independent variable on the dependent variable while holding other variables constant. This helps to understand the extent to which COE explains changes in the ESG components.

Table 1. The meaning of variable and calculation method list

Variables	Definition
COE	The COE is calculated based on the OJ model Ohlson and Juettner-Nauroth (2005) and the PEG model Easton (2004)
ENV	The score assigned to environmental sustainability ranged from 9 to 1.
SOC	The score assigned to social sustainability ranged from 9 to 1.
GOV	The score assigned to governance sustainability ranged from 9 to 1.
ΔROE	Return on Equity (ROE) is defined as net income before extraordinary items, scaled by equity market value at the beginning of the period. The Moderator variable is ΔROE_{t+1} , which reflects the change in the future return on equity ($ROE_{t+1} - ROE_{t+2}$).
β	Derived from CAPM model over the fiscal year ($R_i = R_f + \beta(R_m - R_f)$). Annual beta, sharp thinking from the database.
Financial risk (FR)	Asset-liability ratio
Operation risk (OR)	The ratio of the company's net profit standard deviation in the past five years to the average of the net profit in the past five years
ROA	Return on assets = Net profit/total assets.
LOSS	Dummy variable based on: Net Profit, this takes the value of 1 if a firm reports profit and 0 otherwise.
Asset turnover rate (Turn)	The amount of revenue/average total assets
Size	The natural logarithm of firm's total assets in million renminbi.
Growth	Growth: Based on Operating Revenue. The revenue recognized by the company except interest's income, net earned premiums, commissions and fees income.
IA	IA is information asymmetry which tests the instrumental variable in the 2SLS.
ENV_P	Predictor variable of environment variable to the endogeneity test.
SOC_P	Predictor variable of social variable to the endogeneity test.
GOV_P	Predictor variable of governance variable to the endogeneity test.

Table 2. Descriptive statistics

Statistics						Shapiro-Wilk	
Variable	N	Mean	SD	Minimum	Maximum	W	p
COE _{peg}	474	0.058	0.0188	0.0189	0.128	0.9839	<.001
COE _{onj}	474	0.0579	0.0188	0.0189	0.128	0.9834	<.001
ROE	474	0.659	12.7876	-1.1077	278.452	0.0255	<.001
ENV	474	6.086	0.8040	4	8	0.9855	<.001
SOC	474	6.604	0.9665	4	9	0.9597	<.001
GOV	474	8.204	0.4776	7	9	0.9634	<.001
ESG	474	6.9646	0.2073	6	8	0.9668	<.001
ROA	474	0.0606	0.6071	-4.7407	12.135	0.1101	<.001
Beta	474	1.1335	0.2476	0.4297	2.479	0.9768	<.001
loss	474	0.8312	0.375	0	1	0.4521	<.001
Size	474	21.7998	1.5368	16.7037	25.821	0.9894	.002
Growth	474	19.6777	2.8686	10.8893	25.594	0.9703	<.001
FR	474	-0.0211	23.7952	-507.5153	60.648	0.0533	<.001
OR	474	1.1254	0.626	-1.3092	9.934	0.3438	<.001
Turn	474	3.2532	4.7791	0.1053	28.25	0.5812	<.001

Based on the results of the Breusch-Pagan/Cook-Weisberg test, it can be concluded that the assumption of constant variance (homoskedasticity) is satisfied for the regression model. This indicates that the error term's variance does not vary systematically with the independent variables, and there is no presence of heteroskedasticity in the model.

Furthermore, the results of the Hausman test show a chi-square value of 2.94 and a p-value of 0.4004. Since the p-value is greater than the significance level (usually set at 0.05), we fail to reject the null hypothesis that the random effects model is appropriate and reject to use the fixed effects model.

In summary, the presence of homoskedasticity and the results of the Hausman test indicate that the use of the random effects model for panel data analysis and instrumental variables is appropriate to address the potential issue of endogeneity in the model, and the absence of heteroskedasticity ensures that the model's assumptions regarding constant error variance are satisfied.

4.2.1. Hypothesis ($H_{1a,b,c}$): ESG and cost of capital

Table 4 suggests that environmental and social disclosures (ENV and SOC) positively impact COE, with coefficients of $\beta = 0.00095$ ($p < 0.05$) and $\beta = 0.00132$ ($p < 0.01$). This means that firms that disclose more information about their environmental and social practices may have a higher COE, which suggest that environmental and social disclosures would positively affect COE. This is in contrast to hypotheses **H1a** and **H1b**.

Additionally, the findings don't support hypothesis H1c, which states that governance disclosures (GOV) do not affect COE. The coefficient ($\beta = -0.00038$) suggests that governance disclosures have no significant impact on the COE. This could be because investors view governance disclosures as less relevant to investment decisions than environmental and social disclosures. The findings show no affect on COE which is inconsistent with prior research (Ng & Rezaee, 2015). In addition, governance disclosures may provide investors with irrelevant information about investment decisions, or investors may be more able to assess the quality of governance disclosures without the need for additional information.

Table 3. Matrix of correlations

Variable	ronj	rpeg	ROE	SOC	ENV	GOV	ROA	Beta	Size	Growth	FR	OR	Turn
COE _{peg}	—												
COE _{onj}	0.231***	—											
ROE	0.079	.134**	—										
ENV	-0.122**	-0.079	0.133**	—									
SOC	0.155***	.097*	-0.169***	-0.945***	—								
GOV	-0.084	.033	0.098*	0.074	-0.068	—							
ROA	0.021	.018	-0.108*	-0.086	0.113*	-0.071	—						
Beta	-0.077	.04	-0.091*	-0.06	0.055	-0.016	0.003	—					
Size	-0.075	-0.057	-0.449***	0.061	-0.011	0.022	0.292***	-0.084	—				
Growth	-0.033	-0.006	-0.17***	0.104*	-0.099*	0.027	0.256***	-0.117*	0.625***	—			
FR	-0.024	-.037	-0.03	0.007	0.003	-0.045	-0.002	0.001	0.051	0.01	—		
OR	-0.033	.044	-0.032	-0.058	0.047	-0.011	0.013	0.006	0.023	0.034	0.228***	—	
Turn	-0.022	-.049	-0.104*	-0.028	0.024	-0.049	-0.01	-0.066	0.082	0.047	-0.026	-0.003	—

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, and are the same as the following tables.

Table 4. Sustainability disclosure and cost of capital (COE_{PEG})

Predictor	COE_{PEG}	
	Coefficients	SE
ENV	0.00095**	0.00035
SOC	0.00132***	0.00036
GOV	-0.00038	0.00026
ROA	-0.00054	0.00143
Beta	-0.00806*	0.00348
loss	0.00167	0.00251
Size	-0.00115	0.00075
Growth	-0.00004	0.00037
FR	-0.00001	0.00004
OR	0.00116	0.00137
Turn	-0.00009	0.00018
Constant	0.00989	0.03498
N	474	474
R2	0.0556	

Notes. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.2.2. Hypothesis ($H_{2a,b,c}$): the moderating impact of firm performance

The findings in Table 5 suggest that environmental, social, and governance disclosures (ENV* ROE, SOC* ROE, and GOV* ROE, respectively) have a negative impact on the COE when firm performance (ROE) is considered. Consistent with prior research such as (Dhaliwal et al., 2011; Ng & Rezaee, 2015). The coefficients (ENV * ROE, $\beta = -0.00031$, $p < 0.01$), (SOC * ROE, $\beta = -0.00067$, $p < 0.01$), and (GOV * ROE, $\beta = -0.00124$, $p < 0.01$) indicate that better-performing firms are more likely to mitigate the risk of the COE. This supports hypothesis **H2** ($H_{2a,b,c}$), which suggests that with moderating sustainable financial performance, the ESG disclosures decrease the COE.

This means that companies that perform well financially and disclose more information about their environmental, social, and governance practices may have a lower COE. This may be because investors are more concerned about the company's ESG practices when they are performing well financially. As such companies will already be considered low-risk investments, investors may be looking for additional information to make informed investment decisions. This highlights the importance of ESG disclosures for companies with strong financial performance as it helps to mitigate the risk of COE. It also suggests that ESG disclosures are becoming more relevant and vital for investors in making investment decisions.

4.3. Robustness and sensitivity analysis

Robustness refers to the ability of a system or process to withstand external pressures or shocks and continue to function effectively. In the context of sustainable earnings and the COE, a firm that has robust ESG practices and a strong focus on sustainability may be better able to withstand external pressures and shocks and continue to generate profitable earnings and decrease the risk over the long term. Table 6 shows a robustness check based on the alternative models. For this purpose, a profit-losses firm variable was constructed. Then the models were regressed to test each independent variable included separate in each model. Using Ohlson and Juettner-Nauroth's (COE_{OJ}) (Ohlson & Juettner-Nauroth, 2005) individuals' COE estimates as a dependent variable, assess whether our main findings remain robust. The results were similarly to the main results.

Table 5 indicates that environmental and social disclosures (ENV and SOC, respectively) positively impact the capital equity cost (COE_{peg} and COE_{onj}), as indicated by the coefficients ($\beta =$

Table 5. The moderating of firm performance

Predictor	COE _{PEG}	COE _{PEG}	COE _{PEG}
ENV	-.00004 (.00014)		
ΔROE	-.00108*** (.00007)		
ENV * ΔROE	-.00031*** (.00002)		
SOC		.00003 (.00014)	
ΔROE		-.00163*** (.00007)	
SOC * ΔROE		-.00067*** (.00003)	
GOV			-.00116*** (.00026)
ΔROE			-.00459*** (.00007)
GOV * ΔROE			-.00124*** (.00002)
ROA	-.000522** (.000259)	-.000550*** (.000199)	-.000507* (.000273)
Beta	-.00793*** (.000634)	-.00819*** (.000485)	-.00749*** (.000665)
loss	.00150*** (.000454)	.00160*** (.000348)	.00133*** (.000479)
Size	-.000670*** (.000133)	-.000795*** (.000102)	-.000709*** (.000140)
Growth	-.000196*** (.0000672)	-.000126** (.0000516)	-.000224*** (.0000705)
BTM	.0000000 (.0000003)	-.0000002 (.0000002)	.0000002 (.0000003)
FR	-.0000122* (.0000066)	-.0000136*** (.0000050)	-.0000117* (.0000069)
OR	.000890*** (.000248)	.000964*** (.000190)	.000914*** (.000261)
Turn	-.0000723** (.0000329)	-.0000878*** (.0000252)	-.0000505 (.0000345)
Constant	.0962*** (.00280)	.0663*** (.00219)	.106*** (.00381)
N	474	474	474
R2	.0271	.0190	.0208

Notes. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

0.00103, $p < 0.1$; $\beta = 0.00148$, $p < 0.05$; $\beta = 0.00091$, $p < 0.1$; and $\beta = 0.00123$, $p < 0.05$). This means that firms that disclose more information about their environmental and social practices may have a higher COE. These findings consistent with those main results which unsupported the hypotheses H1a and H1b, which would suggest that the environmental and social disclosures would positively

affect the COE. The hypothesis H1c, that governance disclosures (GOV) would have no effect on the COE (COE_{peg}), was not supported by the findings. The results indicated that while governance disclosures had no significant impact on COE_{peg} for high-performing firms (as indicated by a coefficient of $\beta = -0.00044$), they did have a significant impact on the COE (COE_{onj}) for low-performing firms (with a coefficient of $\beta = -0.00070$, $p < 0.1$). This suggests that governance disclosures can play a role in determining the COE, particularly for firms that are underperforming.

Overall, moderating of firm performance in the case of profit-loss models were regressed, as shown in Table 6. Based on independent variables separately in each model, and the results were supported and strengthened the main results and our hypotheses H3a and H3b. Sensitivity analysis is a statistical method that is used to evaluate how different values of an input variable can affect the output of a model or system. In regards to ESG losses and the capital cost, sensitivity analysis can be employed to assess the impact of alterations in a company's ESG disclosures on its financial performance and COE. The evaluation could involve exploring various scenarios, such as advancements or reductions in the company's ESG, and determining how these fluctuations could affect the COE. This can provide insights into the association between a firm's ESG and its COE and can help the firm to understand the potential implications of changes in its ESG for its financial performance and long-term sustainability.

Table 7 indicates that environmental, social, and governance disclosures (ENV* ROE, SOC* ROE, and GOV* ROE, respectively) have a negative impact on the capital equity cost when sustainable firm performance (Δ ROE) is considered, especially in the performing firms. This supports our main results. However, in the low-performing firms (loss model), the coefficients (ENV * ROE, $\beta = -0.00229$) indicate more environmental disclosure would not affect the capital equity cost. In the case of social disclosure, the coefficient (SOC * ROE, $\beta = 0.00278$, $p < 0.1$) affects COE positively, and (GOV * ROE, $\beta = -0.00017$, $p < 0.01$) indicate that the risk of the capital cost is mitigated among firms even with low-performing firms. As a result, sustainable earnings can potentially affect a company's ESG and COE in the following ways; companies with good sustainable earnings may be better able to invest in initiatives that improve their ESG performance, such as transitioning to more sustainable production methods or investing in renewable energy. This may make the company a more attractive investment opportunity for investors who prioritise ESG factors, which could lead to a lower COE. Companies with good sustainable earnings may be viewed as lower-risk investment opportunities, as they have a track record of generating profits over the long term. Investors will be attracted to them as a result, and their COE will be lower. In contrast, companies with weak sustainable earnings may be considered riskier investments. Therefore, capital costs might rise.

On the other hand, if a company has weak sustainable earnings, this may raise concerns about the company's financial stability and ability to generate profits over the long term. This may make the company a less attractive investment opportunity, which could lead to a higher COE. ESG factors can also potentially affect a company's COE.

4.4. Endogeneity analysis

Incorporating ESG factors into the analysis enables us to assess how firms' environmental performance, social responsibility, and corporate governance practices influence their cost of equity. Understanding this relationship is crucial for investors, policymakers, and companies themselves as it provides insights into the financial benefits and risks associated with ESG integration. By specifically examining the Chinese market, we contribute to the understanding of the relationship between ESG practices and the cost of equity within a unique and rapidly developing economic context. To achieve our research objectives, we employ the Two-Stage Least Squares (2SLS) regression analysis, a robust method that mitigates potential endogeneity issues and establishes a causal relationship between ESG practices and the cost of equity.

The findings presented in Table 5 indicate that environmental, social, and governance (ESG) disclosures (ENV* ROE, SOC* ROE, and GOV* ROE) have a negative impact on the cost of equity

Table 6. ESG sustainability disclosure and cost of capital (profit-loss model)

Predictor	Profit model			Loss model		
	COE _{PEG}		COE _{0J}	COE _{PEG}		COE _{0J}
	Coefficients	SE	Coefficients	SE	Coefficients	SE
ENV	0.00103*	0.00043	0.00101*	0.00044	0.00091*	0.00038
SOC	0.00148**	0.00045	0.00143**	0.00046	0.00123**	0.00040
GOV	-0.00044	0.00029	0.00026	0.00029	-0.00070*	0.00029
ROA	0.00036	0.00155	-0.00069	0.00159	-0.00314	0.00385
Beta	-0.00836*	0.00384	0.00260	0.00396	-0.00734	0.00396
loss	-0.00064	0.00083	-0.00087	0.00086	-0.00169	0.00092
Size	-0.00011	0.00040	0.00020	0.00042	0.00092*	0.00046
Growth	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FR	0.00109	0.00139	0.00293*	0.00143	0.00090	0.00140
OR	-0.00012	0.00019	-0.00012	0.00020	0.00004	0.00020
Turn	0.00103*	0.00043	0.00101*	0.00044	0.00091*	0.00038
Constant	-0.00565	0.04382	-0.05639	0.04525	0.02763	0.04024
N	314	314	314	314	80	80
R2	0.0628		0.0485		0.0651	0.0388

Notes. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7. The moderating of firm performance (profit-loss model)

	Profit model			Loss model		
Predictor	COEpeg	COEpeg	COEpeg	COEpeg	COEpeg	COEpeg
ENV	-.00004 (.00014)			-.00019 (.217)		
ΔROE	-.00108*** (.00007)			.00932 (.095)		
ENV * ΔROE	-.00031*** (.00002)			-.00229 (.06)		
SOC		.00003 (.00014)			.00037* (.00016)	
ΔROE		-.00163*** (.00007)			.01237* (.00556)	
SOC * ΔROE		-.00067*** (.00003)			.00278* (.00131)	
GOV			-.00116*** (.00026)			-.00084** (.00029)
ΔROE			-.00459*** (.00007)			-.00081*** (.00007)
GOV * ΔROE			-.00124*** (.00002)			-.00017*** .000016
ROA	-.000393 (.00143)	-.000413 (.00142)	-.000395 (.00143)	-.000229 (.00143)	-.000232 (.00143)	-.000120 (.00144)
Beta	-.00800** (.00353)	-.00826** (.00350)	-.00755** (.00353)	.00183 (.00355)	.00167 (.00354)	.00213 (.00355)
Size	-.000587 (.000730)	-.000707 (.000723)	-.000634 (.000730)	-.000479 (.000743)	-.000574 (.000739)	-.000593 (.000743)
Growth	-.000167 (.000371)	-.00010 (.000370)	-.000198 (.000371)	.000058 (.000374)	.000104 (.000374)	.000020 (.000374)
BTM	.000000 (.00000)	.00000 (.00000)	.00000 (.000002)	.000000 (.000002)	.000000 (.000002)	.000000 (.000002)
FR	-.000010 (.00004)	-.00001 (.00004)	-.000010 (.000036)	.000014 (.000037)	.000014 (.000036)	.000018 (.000037)
OR	.000916 (.00138)	.000992 (.00137)	.000937 (.00139)	.00250* (.00139)	.00256* (.00138)	.00254* (.00139)
Turn	-.00006 (.000182)	-.00008 (.000181)	-.000042 (.000182)	-.000119 (.000187)	-.000125 (.000187)	-.000105 (.000188)
Constant	.0951*** (.0155)	.0651*** (.0157)	.106*** (.0202)	.0739*** (.0156)	.0500*** (.0160)	.0574*** (.0205)
N	314	314	314	80	80	80
R-squared	.023	.036	.020	.017	.023	.012

Standard errors are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

(COE). Specifically, a one percent increase in ESG disclosures is associated with a negative effect on the COE, with the coefficients as follows: (ENV * ROE, $\beta = -0.00031$, $p < 0.01$), (SOC * ROE, $\beta = -0.00067$, $p < 0.01$), and (GOV * ROE, $\beta = -0.00124$, $p < 0.01$).

To address potential simultaneity bias due to the bidirectional relationship between COE and ESG, an instrumental variable (IV) approach is utilized. An instrumental variable that impacts ESG but not COE, and is uncorrelated with the error term, is sought. The information asymmetry variable (IV) is identified as a suitable variable, affecting ESG disclosures while having no impact on COE, making it a viable instrument for the analysis. To ensure the robustness of the findings, the variable ROA is eliminated as a control, ensuring there's no overlap in performance measurement with ROE. The results presented in columns [1–3] demonstrate the statistical significance of both the sustainability variables and the instrumental variable, indicating a clear association between the IV variable and the sustainability variables.

This approach allows us to provide reliable and empirical evidence on the relationship between ESG practices and the cost of equity in the Chinese market, yielding valuable insights into the financial implications of sustainable business practices in China. Furthermore, Table 8 presents the results of the endogeneity test conducted in the first stage of the analysis. The estimates and standard errors for various predictors, including environmental (ENV), social (SOC), and governance (GOV) factors, are provided. The inclusion of instrumental variables helps strengthen the validity of the instruments used in the analysis (Alduais, 2022; Alduais et al., 2022; Larcker & Rusticus, 2010).

In Table 8, we included the instrumental variables, which address the issue of endogeneity as a potential threat and enable us to estimate the second-stage model. The potential endogeneity issue in this study was addressed through a 2SLS analysis. Suitable instrumental variables were carefully selected as proxies for the potentially endogenous ESG variables, ensuring their correlation with ESG factors while lacking direct association with the COE. In the first stage, the endogenous ESG variables were regressed on the chosen instrumental variables to obtain predicted values for ESG (ENV_P, SOC_P and GOV_P), establishing an exogenous component and mitigating endogeneity. Subsequently, in the second stage, the COE was regressed on the predicted ESG values, alongside control variables.

The validity and strength of the instruments were assessed using the various tests in Table 8, confirming their robustness and validity Tests. **IV (2SLS) Estimation Results and Analysis:** The IV (2SLS) estimation serves as a powerful tool for mitigating endogeneity concerns by employing instrumental variables. The estimation outcomes, intricately analyzed below, are complemented by a battery of statistical tests that are specifically designed to validate the robustness and reliability of the results. **Underidentification Test:** One of the crucial tests conducted is the underidentification test, which utilizes the Anderson Canonical Correlation LM statistic. The calculated test statistic, a significant 392.220, is accompanied by an astonishingly low p-value of 0.0000. This compelling evidence prompts the rejection of the null hypothesis, offering strong assurance that the model is devoid of underidentification issues. This finding underscores the model's ability to accurately capture the relationships among variables. **Weak Identification Test:** Another significant assessment is the examination of weak instrument strength using the Cragg-Donald Wald F statistic. The calculated F statistic stands at a substantial 608.972. This value is then compared against the Stock-Yogo critical values, encompassing different levels of maximal IV relative biases. The analysis conclusively reveals that the instruments deployed in the model are far from weak. These instrumental variables demonstrate a commendable level of explanatory power, effectively contributing to the accurate estimation of the endogenous variable. **Overidentification Test (Sargan Statistic):** The overidentification test, gauged through the Sargan statistic, adds another layer of validation. The computed Sargan statistic registers at 0.428, and the corresponding p-value of 0.9344 is decidedly non-significant. This outcome offers compelling evidence that the instrumental variables employed are both valid and devoid of any correlation with error terms. This result corroborates the soundness of the model's architecture and the reliability of its results.

The culmination of these validation tests augments the credibility and significance of the IV (2SLS) estimation results. The 2SLS framework effectively addresses endogeneity concerns, and the validation tests collectively strengthen the foundation of the analysis. The comprehensive

Table 8. The endogeneity test results

VARIABLES	(1) 1st stage (OLS) ENV	(2) 1st stage (OLS) SOC	(3) 1st stage (OLS) CG	(4) 2nd stage (2SLS) COE _{PEG}	(5) 2nd stage (2SLS) COE _{PEG}	(6) 2nd stage (2SLS) COE _{PEG}
IA	-0.0814*** (0.000721)	0.0712*** (0.000583)	-0.0268*** (0.000398)			
ENV_P				-0.00228 (0.00257)		
ΔROE				-0.00002 (-0.000004)		
ENV_P * ΔROE				-0.131** (0.0452)		
SOC_P					0.00260 (0.00292)	
ΔROE					-0.00008*** (-0.000001)	
SOC_P * ΔROE					-0.138** (0.0513)	
GOV_P						-0.00704 (0.00792)
ΔROE						-0.00181 (0.00497)
GOV_P * ΔROE						-0.00014*** (0.00000)
Beta	-1.450*** (0.0198)	1.478*** (0.0160)	0.168*** (0.0109)	-0.0110** (0.00522)	-0.0114** (0.00570)	-0.00629* (0.00375)
loss	-0.577***	0.174***	-0.803***	0.000187	0.00116	-0.00383

(continued)

Table 8. (Continued)

VARIABLES	(1) 1st stage (OLS) ENV	(2) 1st stage (OLS) SOC	(3) 1st stage (OLS) CG	(4) 2nd stage (2SLS) COE _{PEG}	(5) 2nd stage (2SLS) COE _{PEG}	(6) 2nd stage (2SLS) COE _{PEG}
Size	(0.0290) 0.416*** (0.0135)	(0.0235) 0.0304*** (0.0109)	(0.0160) 0.178*** (0.00746)	(0.00279) 0.000126 (0.00124)	(0.00259) -0.000925 (0.000729)	(0.00635) 0.00047 (0.00151)
Growth	0.167*** (0.00159)	-0.258*** (0.00129)	0.0412*** (0.000880)	0.000164 (0.000629)	0.000463 (0.000883)	0.00007 (0.000568)
BTM	-0.000889*** (0.00003)	0.000855*** (0.00003)	-0.00000 (0.00002)	0.00000 (0.00000)	0.00000 (0.00000)	0.00000 (0.00000)
FR	-0.00995*** (0.00006)	0.00868*** (0.00005)	-0.00601*** (0.00003)	-0.00003 (0.00003)	-0.00003 (0.00003)	-0.00005 (0.00005)
OR	0.01450 (0.00955)	-0.215*** (0.00773)	0.0233*** (0.00528)	0.000652 (0.00143)	0.00118 (0.00162)	0.000761 (0.00145)
Turn	-0.0690*** (0.000399)	0.0749*** (0.000323)	0.00762*** (0.000220)	-0.000219 (0.000252)	-0.000256 (0.000285)	-0.00001 (0.000164)
Constant	38.97*** (0.256)	45.20*** (0.207)	53.11*** (0.141)	0.176* (0.103)	-0.0298 (0.132)	0.461 (0.422)
N	474	474	474	474	474	474
R-squared	0.972	0.978	0.949	0.020	0.022	0.017

(Continued)

Table 8. (Continued)						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	1st stage (OLS) ENV	1st stage (OLS) SOC	1st stage (OLS) CG	2nd stage (2SLS) COE _{PEG}	2nd stage (2SLS) COE _{PEG}	2nd stage (2SLS) COE _{PEG}
Underidentification test	Anderson canon. corr. LM statistic: 392.220 Chi-sq(4) P-val = 0.0000					The p-value is remarkably low (0.0000), leading to the rejection of the null hypothesis. This indicates the absence of underidentification issues in the model.
Weak Identification Test	The Cragg-Donald Wald F statistic: 608.972 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.85 10% maximal IV relative bias 10.27 20% maximal IV relative bias 6.71 30% maximal IV relative bias 5.34 10% maximal IV size 24.58 15% maximal IV size 13.96 20% maximal IV size 10.26 25% maximal IV size 8.31					The Cragg-Donald Wald F statistic, measuring weak instrument strength, stands at 608.972. Comparing this statistic to Stock-Yogo critical values (5%, 10%, 20%, and 30% maximal IV relative biases) reveals that the instruments used are not weak. Their explanatory power for the endogenous variable is adequate. Source: Stock-Yogo (2005). Reproduced by permission.
overidentification test	Sargan statistic: 0.428 Chi-sq(3) P-val = 0.9344					This non-significant p-value suggests that the instruments are valid and not correlated with error terms

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

validation process validates the model's structure and the reliability of the estimated coefficients. As a result, researchers and policymakers can place confidence in the findings and draw meaningful insights from the estimated relationships among variables.

In summary, the IV (2SLS) estimation technique stands as a robust approach to tackling endogeneity concerns, ensuring accurate and reliable results. The extensive validation tests, ranging from underidentification to weak instrument strength and overidentification, collectively underscore the model's integrity. This validation process empowers researchers to confidently interpret the estimated coefficients and relationships, contributing to informed decision-making and the formulation of effective policy recommendations. The holistic approach to addressing endogeneity, backed by rigorous validation, enhances the overall impact and value of the analysis.

Additionally, Table 8 showcases the results of the endogeneity test conducted in the second stage (2SLS). The coefficients and standard errors for the predictors COE_{peg}, ENV_P * ΔROE, SOC_P * ΔROE, and GOV_P * ΔROE are presented. These results shed light on the relationship between ESG practices and the cost of equity, providing further insights into the financial implications of sustainable business practices in the Chinese market. The results reveal that the coefficients for environmental, social, and governance (ESG) disclosure variables remain statistically significant in the sustainability model, indicating their negative impact on the cost of capital. Specifically, the environmental, social, and corporate governance variables moderated by corporate performance continue to exert a significant negative influence (ENV * ROE, $\beta = -0.131$, $p < 0.05$), (SOC * ROE, $\beta = -0.138$, $p < 0.05$), and (GOV * ROE, $\beta = -0.00014$, $p < 0.01$). on the cost of equity, even after accounting for potential endogeneity. This suggests that firms with stronger sustainability practices experience lower costs of capital.

Overall, through our rigorous analysis using the 2SLS regression method, we contribute to the existing literature by examining the relationship between ESG practices and the cost of equity in the Chinese market while also addressing endogeneity issues. The findings of this study have significant implications for investors, policymakers, and companies aiming to understand the financial benefits and risks associated with ESG integration in the Chinese context. Furthermore, the analysis in Table 8, specifically in columns [4–6], reaffirms the primary findings from Table 5. The negative impact of sustainability variable disclosures on the cost of capital is robustly supported by these results. In summary, the approach involving instrumental variable analysis, validation of the instrument, and the removal of overlapping control variables reinforces the key findings, emphasizing the significant relationship between ESG disclosures and the cost of equity, as demonstrated in both Table 5.

5. Discussion

The association between Environmental, Social, and Governance (ESG) disclosure and the cost of equity (COE) has attracted considerable attention among researchers in recent years. While the literature presents mixed findings, with some studies indicating a positive correlation between ESG and COE, and others suggesting no significant relationship or a negative association, it is evident that firms with robust ESG practices tend to experience lower capital costs (Dhaliwal et al., 2011; Guo & Liu, 2022; Maaloul et al., 2021; Orlitzky et al., 2003). Investors are increasingly willing to accept a lower rate of return on investments in companies that demonstrate transparency in their ESG practices (Deegan et al., 2002). However (Deegan et al., 2002), found no impact of social and environmental disclosures on COE for Australian companies, while (Goss & Roberts, 2011) determined that ESG had no significant effect on the capital cost for US firms. The varying results highlight the importance of considering factors such as stakeholder engagement, regulatory oversight, and industry characteristics, which can influence the association between ESG disclosure and COE (Guo & Liu, 2022) (Khanchel & Lassoued, 2022). found that the three dimensions of ESG disclosure did not have the same impact on the COE for US firms. It's worth noting that factors such as stakeholder engagement, regulatory oversight, and industry can impact the association between ESG disclosure and COE.

The results from Table 4 reveal that environmental and social disclosures (ENV and SOC) exert a positive influence on COE, substantiated by the coefficients ($\beta = 0.00095$, $p < 0.05$ and $\beta = 0.00132$, $p < 0.01$). This suggests that companies providing greater transparency about their environmental and social practices might encounter a higher COE. These findings propose a constructive correlation between environmental and social disclosures and COE, which contradicts the initial hypotheses H1a and H1b. Furthermore, the outcomes challenge hypothesis H1c, which posits that governance disclosures (GOV) lack an impact on COE. The coefficient ($\beta = -0.00038$) suggests that governance disclosures do not significantly affect COE. This outcome could stem from investors perceiving governance disclosures as having lesser influence on investment choices compared to environmental and social disclosures. Interestingly, these results deviate from previous research (Ng & Rezaee, 2015), where governance disclosures exhibited an impact on COE.

Contrary to the original hypotheses (H1a and H1b), the present study provides evidence that environmental and social disclosures (ENV and SOC) have a positive effect on the cost of equity, suggesting that investors may perceive companies with transparent environmental and social practices as either riskier or more trustworthy. This finding diverges from the research conducted by (Ramirez et al., 2022), who found no association between social and environmental scores and capital costs. However, it aligns with the findings of (Ng & Rezaee, 2015), who showed a negative correlation between environmental sustainability performance and COE.

The outcomes derived from Table 5 underscore that environmental, social, and governance (ESG) disclosures (ENV* ROE, SOC* ROE, and GOV* ROE, respectively) exhibit a negative influence on the cost of equity (COE) when considering firm performance (ROE). These findings are in harmony with previous studies such as (Dhaliwal et al., 2011; Ng & Rezaee, 2015). The coefficients (ENV * ROE, $\beta = -0.00031$, $p < 0.01$), (SOC * ROE, $\beta = -0.00067$, $p < 0.01$), and (GOV * ROE, $\beta = -0.00124$, $p < 0.01$) emphasize that companies demonstrating superior financial performance are more inclined to mitigate COE risk. This alignment supports hypothesis H2 (H2a, H2b, H2c), suggesting that ESG disclosures play a moderating role in sustainable financial performance, leading to a reduction in COE.

Essentially, this implies that companies excelling financially and offering more comprehensive insights into their environmental, social, and governance practices might experience a lowered COE. This phenomenon could stem from heightened investor concern over a company's ESG initiatives during periods of strong financial performance. Given that well-performing companies are often perceived as lower-risk investments, investors may seek additional information to make well-informed investment choices. This highlights the critical significance of ESG disclosures for financially robust companies, as they help alleviate the COE risk. Moreover, this underscores the increasing relevance and necessity of ESG disclosures in guiding investor decisions. Overall, the alignment between strong financial performance, robust ESG disclosures, and reduced COE accentuates the importance of transparency and sustainable practices. Companies demonstrating both financial prowess and a commitment to ESG principles are likely to gain favor among investors seeking to manage risk and make informed investment selections.

Furthermore, Chinese companies with higher ESG scores demonstrate a benefit of lower COE, suggesting that ESG factors can reduce COE both directly and indirectly by mitigating market risks and diversifying equity (Chen et al., 2023). The robustness check conducted in this study confirms the importance of ESG disclosures in investment decision-making, aligning with previous research that suggests the association between ESG and COE is moderated by stakeholder engagement (Al-Tuwaijri et al., 2004). Companies with high levels of stakeholder engagement exhibit a stronger positive association between ESG and COE.

These findings highlight the significance of considering stakeholder perspectives and engagement as complementary factors in understanding the relationship between ESG disclosure and

COE. While the present study contributes valuable insights, it is essential to acknowledge its limitations and identify areas for future research. Firstly, the study focused on a specific region and industry, limiting the generalizability of the findings. Future research should expand the analysis to include other regions and countries to assess the universality of the observed associations. Moreover, this study primarily employed quantitative measures of ESG disclosure and firm performance. Future research could supplement these findings with qualitative approaches such as interviews or case studies to provide a more in-depth understanding of the underlying mechanisms and processes through which ESG practices influence COE. Qualitative research can provide rich insights into the perceptions and experiences of investors, stakeholders, and company executives regarding ESG disclosures and their impact on COE.

Furthermore, moderating firm performance in the case of profit-loss models, as presented in Table 6, reaffirms and strengthens the main findings and hypotheses H3a and H3b. Sensitivity analysis, employed to gauge the impact of ESG disclosures on financial performance and COE, is relevant here. It can explore scenarios involving ESG changes and their influence on COE. Considering sustainable firm performance (ΔROE), Table 7 demonstrates that environmental, social, and governance disclosures ($ENV \times ROE$, $SOC \times ROE$, and $GOV \times ROE$) negatively impact the capital equity cost, particularly among performing firms. The coefficients are as follows: ($ENV \times ROE$, $\beta = -0.00229$), ($SOC \times ROE$, $\beta = 0.00278$, $p < 0.1$), and ($GOV \times ROE$, $\beta = -0.00017$, $p < 0.01$). In low-performing firms (loss model), results differ. Sustainable earnings impact ESG and COE dynamics. Strong sustainable earnings enable ESG investment, attracting ESG-focused investors and potentially lowering COE. Weak earnings raise concerns, possibly elevating COE. Moreover, Table 8's 2SLS endogeneity test confirms the significant negative impact of environmental, social, and governance (ESG) disclosure variables on COE. The coefficients remain notable: ($ENV \times ROE$, $\beta = -0.131$, $p < 0.05$), ($SOC \times ROE$, $\beta = -0.138$, $p < 0.05$), and ($GOV \times ROE$, $\beta = -0.00014$, $p < 0.01$). In summary, our comprehensive approach using the 2SLS regression method substantiates the ESG-COE relationship in the Chinese market while addressing endogeneity. This insight holds value for stakeholders seeking to comprehend ESG's financial implications. Table 8's analysis further reinforces the primary findings from Table 5, underlining the substantial link between ESG disclosures and COE.

Additionally, this study examined the association between ESG disclosure and COE at a specific point in time. It would be valuable for future research to adopt a longitudinal approach to investigate how the relationship between ESG disclosure and COE evolves over time. This would allow for a deeper understanding of the dynamic nature of ESG practices and their effects on COE. Furthermore, this study primarily focused on the environmental and social dimensions of ESG disclosure. Future research should explore the specific impacts of governance practices on COE. Understanding the relative importance of each dimension of ESG disclosure in influencing COE can provide more comprehensive insights into the mechanisms through which ESG practices affect investor perceptions and risk assessments. Another area for future research is the examination of different industry contexts. Industries may vary in terms of their susceptibility to ESG factors, regulatory environments, and stakeholder expectations. Investigating how the association between ESG disclosure and COE differs across industries can help identify industry-specific dynamics and provide industry-specific guidelines for companies seeking to enhance their ESG practices. Additionally, while this study focused on the association between ESG disclosure and COE, future research could explore the impact of COE on other financial and non-financial performance measures. Understanding the broader implications of COE on company outcomes such as profitability, market valuation, and reputation can provide a more holistic perspective on the value of ESG practices for companies. Finally, future research needs to continue exploring the mechanisms through which ESG disclosures influence investor perceptions and risk assessments. Factors such as information asymmetry, investor preferences, and market reactions to ESG information can significantly shape the relationship between ESG disclosure and COE. Further investigation into these underlying mechanisms can enhance our understanding of the drivers and consequences of the observed associations.

In conclusion, this study contributes to the ongoing discussion on the association between ESG disclosure and COE. The findings suggest that environmental and social disclosures have a positive effect on COE, contradicting some previous research but aligning with others. The role of firm performance as a moderator further highlights the importance of considering financial strength in understanding the impact of ESG practices on COE. These findings underscore the relevance of ESG considerations for investors and emphasize the need for companies to prioritize sustainable practices and transparent disclosure. However, it is important to recognize the limitations of this study and encourage future research to build upon these findings and explore additional dimensions and contexts to gain a more comprehensive understanding of the relationship between ESG disclosure and COE.

6. The theoretical, managerial, and practical implications

6.1. Theoretical implications

The present study contributes significantly to the existing literature on the association between ESG disclosure and COE by offering robust empirical evidence and shedding light on the intricate relationship between these variables. Our findings challenge some prior assumptions and provide new insights into the theoretical underpinnings of ESG and COE. Specifically, we highlight the importance of considering firm performance as a moderating factor in this association, emphasizing the need for a comprehensive understanding of the interplay between ESG practices, firm performance, and COE. By uncovering these theoretical implications, our research adds valuable knowledge to the ongoing discussions in the field of finance and sustainability research.

The implications of our study extend beyond the financial realm and have significant societal and environmental dimensions. By emphasizing the importance of ESG practices and their impact on COE, our research underscores the critical role that businesses play in promoting sustainability and responsible corporate behavior. As companies prioritize ESG disclosure and transparency, they signal their commitment to addressing environmental and social challenges. By doing so, firms can contribute to the attainment of global sustainability goals, such as those outlined in the United Nations' Sustainable Development Goals (SDGs).

Improved ESG practices can lead to positive changes in environmental stewardship. Companies that focus on reducing their carbon footprint, adopting eco-friendly practices, and implementing energy-efficient measures can contribute to mitigating climate change and preserving natural resources. Additionally, by engaging in social responsibility initiatives, such as supporting local communities, promoting diversity and inclusion, and ensuring ethical supply chain practices, businesses can make a meaningful impact on social welfare and societal well-being.

Furthermore, our research has implications for sustainable development in China and beyond. As the world's second-largest economy and a significant global player, China's efforts in embracing sustainable practices and reducing its COE can set an example for other emerging economies and multinational corporations. The adoption of sustainable business practices by Chinese companies can catalyze positive changes in corporate behavior worldwide, promoting a collective commitment to environmental and social responsibility.

6.2. Managerial implications

The study's managerial implications are essential for companies seeking to improve their ESG practices and reduce their COE. Firstly, our findings suggest that companies should prioritize transparency and disclosure of their ESG performance. By providing comprehensive information about their environmental, social, and governance practices, companies can build trust and credibility with investors, ultimately leading to a lower COE as investors perceive the company as less risky and more sustainable.

Secondly, companies should focus on enhancing their sustainable firm performance, as it can serve as a buffer against market risks and contribute to a lower COE. This means implementing

strategic initiatives to improve environmental practices, promote social responsibility, and strengthen corporate governance mechanisms. Furthermore, companies operating in industries with high ESG scrutiny should proactively engage with stakeholders and consider their concerns and expectations to strengthen the positive association between ESG and COE.

Thirdly, Our study's implications extend to the financial markets, affecting investor decision-making and capital allocation. As investors become more conscious of environmental and social risks, they increasingly factor ESG considerations into their investment strategies. The findings of our research can empower investors to make more informed decisions, allowing them to identify companies with stronger ESG practices and potentially superior risk-adjusted returns. This shift in investor behavior can drive capital towards companies with robust sustainability profiles, incentivizing other firms to improve their ESG performance to remain attractive to investors.

Moreover, the study's implications can influence the cost of capital for companies. As firms enhance their ESG practices and disclose relevant information, they can attract more socially responsible investors who prioritize sustainability in their investment decisions. As a result, companies with better ESG performance may benefit from a reduced COE, which can enhance their financial competitiveness and long-term profitability.

6.3. Practical implications

The study's practical implications are relevant to policymakers, investors, and other stakeholders. Policymakers and regulatory bodies can leverage our findings to develop and enforce regulations that encourage companies to disclose their ESG information. By mandating transparent ESG disclosures, policymakers can enhance investor confidence and promote sustainable investment practices. Additionally, policymakers can consider offering incentives and penalties to encourage companies to improve their ESG performance, such as tax breaks for meeting certain ESG standards or fines for non-compliance.

Investors can use the findings to inform their investment decisions and prioritize companies with strong ESG practices, potentially leading to better risk-adjusted returns. By incorporating ESG factors into their investment strategies, investors can contribute to the promotion of sustainable business practices in the Chinese market. Furthermore, the study emphasizes the importance of research and development support in areas related to ESG performance. Policymakers and organizations can allocate resources and funding to support research initiatives aimed at developing innovative and sustainable business practices. This support will enable companies to innovate and transition to more sustainable business models, ultimately benefiting both their financial performance and their positive impact on society and the environment.

Our research findings have important policy and regulatory implications. Policymakers and regulatory bodies can leverage the empirical evidence from our study to strengthen and refine existing regulations related to ESG disclosure and reporting. By aligning regulatory frameworks with global best practices and encouraging transparent disclosure, policymakers can promote a more sustainable and responsible corporate landscape.

In addition to enforcing ESG disclosure requirements, policymakers can explore incentives and rewards for companies that excel in sustainable practices. Such incentives could include tax breaks, grants, or preferential access to capital markets, motivating firms to adopt and maintain strong ESG profiles.

Conversely, policymakers may consider introducing penalties or sanctions for non-compliance with ESG reporting standards. By establishing consequences for companies that neglect their environmental and social responsibilities, regulators can create a stronger deterrent against unethical and unsustainable practices.

In conclusion, the implications of our study transcend the traditional boundaries of finance and sustainability research. By shedding light on the association between ESG practices and COE in the Chinese business landscape, we highlight the potential for businesses to foster positive societal, environmental, and financial impacts. Theoretical, managerial, practical, societal, environmental, financial, and policy implications are integral to fostering a sustainable and prosperous future for businesses, society, and the environment.

In summary, our research provides valuable theoretical, managerial, and practical implications. By aligning their strategies with sustainable practices and transparent disclosure, companies can not only improve their financial performance but also contribute to a more sustainable and responsible business environment. Policymakers and investors can use these insights to foster a sustainable ecosystem that promotes long-term value creation and aligns with global sustainability goals.

7. Limitations and future research

7.1. Limitations

While this study provides valuable insights into the association between ESG disclosure and the cost of equity (COE), it is important to acknowledge certain limitations that may influence the interpretation of the findings. Firstly, the study focuses on a specific context, namely Chinese companies, which may limit the generalizability of the results to other countries or regions. Different regulatory frameworks, cultural factors, and market conditions can influence the relationship between ESG disclosure and COE in different contexts. Future research could explore these relationships in diverse settings to provide a more comprehensive understanding of the topic. Secondly, the study relies on secondary data sources, such as financial reports and ESG disclosures, which are subject to potential biases and measurement errors. While efforts were made to ensure data accuracy and reliability, there is still a possibility of limitations in the data quality. Future research could employ primary data collection methods or utilize alternative data sources to mitigate these limitations. Another limitation is the focus on ESG disclosure without considering the actual ESG performance and impact of the companies. While ESG disclosure provides important information, it does not necessarily reflect the actual environmental and social practices of the firms. Future studies could incorporate direct measures of ESG performance to provide a more comprehensive assessment of the relationship with COE. Furthermore, the study primarily examines the impact of ESG disclosure on COE, without considering the reverse causality or potential bidirectional relationships. Companies with lower COE may be more incentivized to disclose their ESG practices. Future research could investigate the dynamic nature of the relationship and explore potential feedback effects between ESG disclosure and COE.

7.2. Future research

Building on the limitations identified, several avenues for future research can further advance the understanding of the association between ESG disclosure and COE. Firstly, expanding the analysis to different countries and regions can provide a comparative perspective on the relationship between ESG disclosure and COE. This can help identify the role of regulatory frameworks, cultural factors, and market conditions in shaping the association. Secondly, future research could explore the role of different stakeholders, such as employees, customers, and communities, in influencing the association between ESG disclosure and COE. Understanding how different stakeholders perceive and respond to ESG disclosures can provide valuable insights into the mechanisms through which ESG practices impact capital costs. Additionally, incorporating longitudinal and panel data analyses can provide insights into the dynamic nature of the relationship over time. Examining the long-term effects of ESG disclosure on COE and exploring potential feedback effects can enhance the understanding of the causal relationships between these variables. Moreover, future studies could delve deeper into specific industries or sectors to examine the heterogeneity in the relationship between ESG disclosure and COE. Different industries may face distinct environmental and social challenges, which can influence the impact of ESG disclosure on capital costs.

Lastly, exploring the mediating and moderating factors that influence the association between ESG disclosure and COE can provide a more nuanced understanding of the mechanisms at play. Factors such as stakeholder engagement, industry norms, and firm characteristics can shape the relationship and should be considered in future research. By addressing these limitations and pursuing the suggested avenues for future research, scholars can advance the knowledge of the relationship between ESG disclosure and COE, leading to more comprehensive and robust insights for both academics and practitioners.

8. Conclusion

The association between ESG disclosure, sustainable performance, and capital equity cost (COE) is crucial as it has significant implications for both companies and investors. Companies with strong ESG practices and sustainable performance are generally perceived as less risky and more sustainable by investors, which can lead to a lower COE. This finding is consistent with prior research (Dhaliwal et al., 2014; Guo & Liu, 2022; Maaloul et al., 2021; Orlitzky et al., 2003) that highlights the positive correlation between robust ESG practices and lower capital costs. Investors are more likely to trust and invest in companies that are transparent about their environmental, social, and governance performance and have a track record of sustainable performance (Deegan et al., 2002). Companies with strong ESG practices and sustainable performance are also better positioned to withstand environmental and social challenges, further contributing to a lower COE. This aligns with the notion that companies with strong sustainable earnings are perceived as lower-risk investment opportunities, while those with weak sustainable earnings may be viewed as riskier and have a higher COE (Ng & Rezaee, 2015).

Moreover, ESG factors can impact a company's COE. Companies with strong sustainable earnings are more likely to invest in initiatives that improve their ESG performance, making them more attractive to investors who prioritize ESG factors and leading to a lower COE. Conversely, companies with weak sustainable earnings may raise concerns about financial stability and long-term profit generation, making them less attractive to investors and resulting in a higher COE (Chen et al., 2023). In summary, the findings from Table 6 suggest that there is a negative impact on the COE when considering sustainable firm performance (Δ ROE) and environmental, social, and governance disclosures (ENV* ROE, SOC* ROE, and GOV* ROE respectively) for performing firms. However, for non-performing firms, the association between ESG disclosure and COE is less clear. The results indicate that companies with strong sustainable earnings may be viewed as lower-risk investment opportunities and have a lower capital cost, while companies with weak sustainable earnings may be viewed as riskier and have a higher COE. Additionally, ESG factors can also potentially affect a company's COE. Companies with strong sustainable earnings may be better able to invest in initiatives that improve their ESG performance, making them more attractive investment opportunities for investors who prioritise ESG factors and leading to a lower COE. On the other hand, companies with weak sustainable earnings may raise concerns about the company's financial stability and ability to generate profits over the long term, making them less attractive investment opportunities and leading to a higher COE.

Enhanced transparency and accountability through ESG disclosure further enhance investor trust and confidence in a company. This fosters a better alignment of interests between the company and its investors, promoting more stable and sustainable performance over the long term. Companies lacking ESG disclosure may face challenges in attracting investment as ESG risks increasingly impact financial performance and value. Therefore, ESG disclosure plays a crucial role in increasing trust in corporations with sustainable performance, providing investors with the necessary information to evaluate the company's performance and future prospects, thereby reducing the COE and enhancing the reputation of the corporation. The implications of these findings extend to companies, investors, and policymakers. Companies should prioritize ESG practices and transparent disclosure to enhance investment attractiveness and potentially reduce capital costs. Investors can utilize ESG information to make informed investment decisions, considering the potential benefits of investing in companies with robust ESG practices. Policymakers

can leverage these insights to design and implement measures that encourage companies to improve their ESG practices and disclosure, fostering sustainable and responsible business behaviour. In conclusion, this research underscores the importance of ESG disclosure, sustainable performance, and their impact on COE. The findings contribute to the existing literature and provide practical implications for companies, investors, and policymakers. By recognizing the significance of ESG considerations, transparent disclosure, and sustainable practices, stakeholders can strive for financial and environmental sustainability in the Chinese market and beyond.

Acknowledgement

The publication of this research has been supported by the Deanship of Scientific Research and Graduate Studies at Philadelphia University, Jordan.

Funding

This work was supported by the Philadelphia University [Acknowledgments: The publication of this research has been supported by the Deanship of Scientific Research and Graduate Studies at Philadelphia University, Jordan.].

Author details

Fahd Alduais¹

E-mail: falduais@philadelphia.edu.jo

ORCID ID: <http://orcid.org/0000-0001-9435-0340>

¹ Department of Accounting, Philadelphia University, Amman, Jordan.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Citation information

Cite this article as: Unravelling the intertwined nexus of firm performance, ESG practices, and capital cost in the Chinese business landscape, Fahd Alduais, *Cogent Economics & Finance* (2023), 11: 2254589.

References

- Aboud, A., & Diab, A. (2019). The financial and market consequences of environmental, social and governance ratings: The implications of recent political volatility in Egypt. *Sustainability Accounting, Management and Policy Journal*, 10(3), 498–520. <https://doi.org/10.1108/SAMPJ-06-2018-0167>
- Abu Alia, M., Abdeljawad, I., Jallad, S. E., & Rashid, M. (2022). Voluntary disclosure-cost of equity nexus and the moderating role of corporate governance: Evidence from an extremely politically unstable context. *International Journal of Islamic & Middle Eastern Finance & Management*, 15(6), 1035–1052. <https://doi.org/10.1108/IMEFM-02-2021-0069>
- Aerts, W., Cormier, D., & Magnan, M. (2008). Corporate environmental disclosure, financial markets and the media: An international perspective. *Ecological Economics: The Journal of the International Society for Ecological Economics*, 64(3), 643–659. <https://doi.org/10.1016/j.ecolecon.2007.04.012>
- Aintablian, S., McGraw, P. A., & Roberts, G. S. (2007). Bank monitoring and environmental risk. *Journal of Business Finance & Accounting*, 34(1–2), 389–401. <https://doi.org/10.1111/j.1468-5957.2006.00644.x>
- Al Amosh, H., & Khatib, S. F. A. (2021). Ownership structure and environmental, social and governance performance disclosure: The moderating role of the board independence. *Journal of Business and Socio-Economic Development*, 2(1), 49–66. <https://doi.org/10.1108/JBSED-07-2021-0094>
- Albarrak, M. S., Elnahass, M., & Salama, A. (2019). The effect of carbon dissemination on cost of equity. *Business Strategy and the Environment*, 28(6), 1179–1198. <https://doi.org/10.1002/bse.2310>
- Albring, S., Banyl, M., Dhaliwal, D., & Pereira, R. (2016). Does the firm information environment influence financing decisions? A test using disclosure regulation. *Management Science*, 62(2), 456–478. <https://doi.org/10.1287/mnsc.2014.2123>
- Alduais, F. (2016). An empirical study on capital structure and corporate performance of Chinese listed companies. *Journal of Commerce and Accounting Research*, 5(3), 18–21. <https://doi.org/10.21863/jcar/2016.5.3.032>
- Alduais, F. (2019). Readability of firms disclosure and cost of equity capital: An empirical study of Chinese listed companies. *Research Result Economic Research*, 5(2), 10–21. <https://doi.org/10.18413/2409-1634-2019-5-2-0-2>
- Alduais, F. (2022). Textual analysis of the annual report and corporate performance: Evidence from China. *Journal of Financial Reporting and Accounting*. ahead-of-p(ahead-of-print). <https://doi.org/10.1108/JFRA-04-2022-0129>
- Alduais, F., Almasria, N. A., & Airout, R. (2022). The moderating effect of corporate governance on corporate social responsibility and information asymmetry: An empirical study of Chinese listed companies. *Economies*, 10(11), 280. <https://doi.org/10.3390/economies10110280>
- Alduais, F., Almasria, N. A., Samara, A., & Masadeh, A. (2022). Conciseness, financial disclosure, and market reaction: A textual analysis of Annual reports in listed Chinese companies. *International Journal of Financial Studies*, 10(4), 104. <https://doi.org/10.3390/IJFS10040104>
- Alduais, F., Alsawalhah, J., & Almasria, N. A. (2023). Examining the impact of corporate governance on investors and investee companies: Evidence from Yemen. *Economies*, 11(1), 13–25. <https://doi.org/10.3390/economies11010013>
- Allen, P., Bonazzi, C., & Gee, D. (2017). Global reporting initiative. *Metaphors for change: Partnerships, tools and civic action for sustainability* (pp. 238–239). <https://doi.org/10.4324/9781351282444>
- Almeyda, R., & Darmansyah, A. (2019). The influence of environmental, social, and governance (ESG) disclosure on firm financial performance. *IPTEK Journal of Proceedings Series*, 0(5), 278–290. <https://doi.org/10.12962/J23546026.Y2019I5.6340>
- Alsayegh, M. F., Abdul Rahman, R., & Hodayoun, S. (2020). Corporate Economic, environmental, and social sustainability performance Transformation through ESG disclosure. *Sustainability*, 12(9), 3910. <https://doi.org/10.3390/su12093910>
- Al-Tuwaijri, S. A., Christensen, T. E., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations & Society*, 29(5–6), 447–471. [https://doi.org/10.1016/S0361-3682\(03\)00032-1](https://doi.org/10.1016/S0361-3682(03)00032-1)
- Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies. *Management of Environmental Quality: An International Journal*, 29(2), 182–194. <https://doi.org/10.1108/MEQ-03-2017-0033>

- Bauer, R., & Hann, D. (2010). Corporate environmental Management and credit risk. *SSRN Electronic Journal*. <https://doi.org/10.2139/SSRN.1660470>
- Beattie, V., Goodacre, A., & Thomson, S. J. (2006). Corporate financing decisions: UK survey evidence. *Journal of Business Finance and Accounting*, 33(9–10), 1402–1434. <https://doi.org/10.1111/j.1468-5957.2006.00640.x>
- Bekaert, G., Engstrom, E., & Xing, Y. (2009). Risk, uncertainty, and asset prices. *Journal of Financial Economics*, 91(1), 59–82. <https://doi.org/10.1016/j.jfneco.2008.01.005>
- Bhaskaran, R. K., Ting, I. W. K., Sukumaran, S. K., & Sumod, S. D. (2020). Environmental, social and governance initiatives and wealth creation for firms: An empirical examination. *Managerial and Decision Economics*, 41(5), 710–729. <https://doi.org/10.1002/mde.3131>
- Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review*, 78(3), 641–678. <https://doi.org/10.2308/accr.2003.78.3.641>
- Bocken, N. M. P., & Short, S. W. (2021). Unsustainable business models – Recognising and resolving institutionalised social and environmental harm. *Journal of Cleaner Production*, 312, 127828. <https://doi.org/10.1016/J.JCLEPRO.2021.127828>
- Broggi, M., & Lagasio, V. (2019). Environmental, social, and governance and company profitability: Are financial intermediaries different? *Corporate Social Responsibility and Environmental Management*, 26(3), 576–587. <https://doi.org/10.1002/CSR.1704>
- Brooks, C., & Oikonomou, I. (2018). The effects of environmental, social and governance disclosures and performance on firm value: A review of the literature in accounting and finance. *The British Accounting Review*, 50(1), 1–15. <https://doi.org/10.1016/j.bar.2017.11.005>
- Buertey, S., Sun, E. J., Lee, J. S., & Hwang, J. (2020). Corporate social responsibility and earnings management: The moderating effect of corporate governance mechanisms. *Corporate Social Responsibility and Environmental Management*, 27(1), 256–271. <https://doi.org/10.1002/CSR.1803>
- Cek, K., & Eyupoglu, S. (2020). Does environmental, social and governance performance influence economic performance? *Journal of Business Economics and Management*, 21(4), 1165–1184. <https://doi.org/10.3846/jbem.2020.12725>
- Cesarone, F., Martino, M. L., & Carleo, A. (2022). Does ESG impact really enhance portfolio profitability? *Sustainability*, 14(4), 2050. <https://doi.org/10.3390/su14042050>
- Changar, M., & Atan, T. (2021). The role of transformational and transactional leadership approaches on environmental and ethical aspects of CSR. *Sustainability*, 13(3), 1411. <https://doi.org/10.3390/SU13031411>
- Chen, J. C., Cho, C. H., & Patten, D. M. (2014). Initiating disclosure of environmental liability information: An empirical analysis of firm choice. *Journal of Business Ethics*, 125(4), 681–692. <https://doi.org/10.1007/s10551-013-1939-0>
- Cheng, S., Lin, K. Z., & Wong, W. (2016). Corporate social responsibility reporting and firm performance: Evidence from China. *Journal of Management & Governance*, 20(3), 503–523. <https://doi.org/10.1007/s10997-015-9309-1>
- Chen, Y., Li, T., Zeng, Q., & Zhu, B. (2023). Effect of ESG performance on the cost of equity capital: Evidence from China. *International Review of Economics & Finance*, 83, 348–364. <https://doi.org/10.1016/j.iref.2022.09.001>
- Chouaibi, Y., & Zouari, G. (2022). The mediating role of real earnings management in the relationship between CSR practices and cost of equity: Evidence from European ESG data. *EuroMed Journal of Business*. <https://doi.org/10.1108/EMJB-12-2021-0183>
- Clementino, E., & Perkins, R. (2021). How do companies respond to environmental, social and governance (ESG) ratings? Evidence from Italy. *Journal of Business Ethics*, 171(2), 379–397. <https://doi.org/10.1007/s10551-020-04441-4>
- Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, 37(1), 39–67. <https://doi.org/10.1177/0149206310388419>
- Dahiya, M., & Singh, S. (2020). The linkage between CSR and cost of equity: An Indian perspective. *Sustainability Accounting, Management and Policy Journal*, 12(3), 499–521. <https://doi.org/10.1108/SAMPJ-10-2019-0379>
- Dahlsrud, A. (2008). How corporate social responsibility is defined: An analysis of 37 definitions. *Corporate Social Responsibility and Environmental Management*, 15(1), 1–13. <https://doi.org/10.1002/csr.132>
- Deegan, C., Rankin, M., & Tobin, J. (2002). An examination of the corporate social and environmental disclosures of BHP from 1983–1997: A test of legitimacy theory. *Accounting Auditing & Accountability Journal*, 15(3), 312–343. <https://doi.org/10.1108/09513570210435861>
- Dhaliwal, D. S., Khurana, I. K., & Pereira, R. (2011). Firm disclosure policy and the choice between private and public debt. *Contemporary Accounting Research*, 28(1), 293–330. <https://doi.org/10.1111/j.1911-3846.2010.01039.x>
- Dhaliwal, D., Li, O. Z., Tsang, A., & Yang, Y. G. (2014). Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy*, 33(4), 328–355. <https://doi.org/10.1016/j.jaccpubpol.2014.04.006>
- Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review*, 86(1), 59–100. <https://doi.org/10.2308/accr.00000005>
- Easton, P. D. (2004). PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital. *The Accounting Review*, 79(1), 73–95. <https://doi.org/10.2308/ACC.2004.79.1.73>
- Eichholtz, P., Holtermans, R., Kok, N., & Yönder, E. (2019). Environmental performance and the cost of debt: Evidence from commercial mortgages and REIT bonds. *Journal of Banking and Finance*, 102, 19–32. <https://doi.org/10.1016/j.jbankfin.2019.02.015>
- El Ghoul, S., Guedhami, O., Kim, H., & Park, K. (2018). Corporate environmental responsibility and the cost of capital: International evidence. *Journal of Business Ethics*, 149(2), 335–361. <https://doi.org/10.1007/s10551-015-3005-6>
- El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking and Finance*, 35(9), 2388–2406. <https://doi.org/10.1016/j.jbankfin.2011.02.007>
- Engle, R. (2018). Systemic risk 10 years later. *Annual Review of Financial Economics*, 10(1), 125–152. <https://doi.org/10.1146/ANNUREV-FINANCIAL-110217-023056>
- Erragragui, E. (2018). Do creditors price firms' environmental, social and governance risks? *Research in International Business and Finance*, 45, 197–207. <https://doi.org/10.1016/j.ribaf.2017.07.151>

- Fandella, P., Sergi, B. S., & Sironi, E. (2023). Corporate social responsibility performance and the cost of capital in BRICS countries. The problem of selectivity using environmental, social and governance scores. *Corporate Social Responsibility and Environmental Management*, 30(4), 1712–1722. <https://doi.org/10.1002/CSR.2447>
- Fang, Y., & Guo, J. (2018). Is the environmental violation disclosure policy effective in China?—evidence from capital market reactions. *Economics Research of Journal*, 53(10), 160–176.
- Fazzini, M., & Dal Maso, L. (2016). The value relevance of “assured” environmental disclosure: The Italian experience. *Sustainability Accounting, Management and Policy Journal*, 7(2), 225–245. <https://doi.org/10.1108/SAMPJ-10-2014-0060>
- Franceschelli, M. V., Santoro, G., Giacosa, E., & Quaglia, R. (2019). Assessing the determinants of performance in the recycling business: Evidence from the Italian context. *Corporate Social Responsibility and Environmental Management*, 26(5), 1086–1099. <https://doi.org/10.1002/csr.1788>
- Francis, J., LaFond, R., Olsson, P. M., & Schipper, K. (2004). Cost of equity and earnings attributes. *The Accounting Review*, 79(4), 967–1010. <https://doi.org/10.2308/accr.2004.79.4.967>
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach* (Pitman series in business and public policy). https://scholar.google.com/scholar?hl=en&as_sdt=0%252C5&q=Strategic+management+%2528Pitman+series+in+business+and+public+policy%2529.+A+stakeholder+approach&btnG=
- Garzón-Jiménez, R., & Zorio-Grima, A. (2021). Effects of carbon emissions, environmental disclosures and CSR assurance on cost of equity in emerging markets. *Sustainability*, 13(2), 696. <https://doi.org/10.3390/SU13020696>
- Gerged, A. M., Albitar, K., & Al-Haddad, L. (2021). Corporate environmental disclosure and earnings management—The moderating role of corporate governance structures. *International Journal of Finance and Economics*, 28(3), 2789–2810. <https://doi.org/10.1002/ijfe.2564>
- Gode, D., & Mohanram, P. (2003). Inferring the cost of capital using the Ohlson – Juettner model. *Review of Accounting Studies*, 8(4), 399–431. <https://doi.org/10.1023/A:1027378728141>
- Gonçalves, T. C., Dias, J., & Barros, V. (2022). Sustainability performance and the cost of capital. *International Journal of Financial Studies*, 10(3), 63. <https://doi.org/10.3390/IJFS10030063>
- Goss, A., & Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking & Finance*, 35(7), 1794–1810. <https://doi.org/10.1016/j.jbankfin.2010.12.002>
- Gregurec, I., Tomičić, M., Furjan, T., & Tomičić, K. (2021). The impact of COVID-19 on sustainable business models in SMEs. *Sustainability*, 13(3), 1098. <https://doi.org/10.3390/SU13031098>
- Guo, Y., & Liu, Y. (2022). Sustainable poverty alleviation and green development in China's underdeveloped areas. *Journal of Geographical Sciences*, 32(1), 23–43. <https://doi.org/10.1007/s11442-021-1932-y>
- Gupta, K. (2018). Environmental sustainability and implied cost of equity: International evidence. *Journal of Business Ethics*, 147(2), 343–365. <https://doi.org/10.1007/S10551-015-2971-Z>
- Hail, L., & Leuz, C. (2006). International differences in the cost of equity capital: Do legal institutions and securities regulation matter? *Journal of Accounting Research*, 44(3), 485–531. <https://doi.org/10.1111/J.1475-679X.2006.00209.X>
- Hamrouni, A., Boussaada, R., & Ben Farhat Toumi, N. (2019). Corporate social responsibility disclosure and debt financing. *Journal of Applied Accounting Research*, 20(4), 394–415. <https://doi.org/10.1108/JAAR-01-2018-0020>
- Heflin, F., Moon, J. R., & Wallace, D. (2016). A re-examination of the cost of capital benefits from higher-quality disclosures. *Journal of Financial Reporting*, 1(1), 65–95. <https://doi.org/10.2308/jfir-51322>
- Huang, S. Z., Chien, F., & Sadiq, M. (2022). A gateway towards a sustainable environment in emerging countries: The nexus between green energy and human capital. *Economic Research-Ekonomska Istrazivanja*, 35(1), 4159–4176. <https://doi.org/10.1080/1331677X.2021.2012218>
- Iatridis, G. E. (2013). Environmental disclosure quality: Evidence on environmental performance, corporate governance and value relevance. *Emerging Markets Review*, 14(1), 55–75. <https://doi.org/10.1016/J.EMEMAR.2012.11.003>
- Ionescu, G. H., Firoiu, D., Pirvu, R., & Vilag, R. D. (2019). The impact of ESG factors on market value of companies from travel and tourism industry. *Technological and Economic Development of Economy*, 25(5), 820–849. <https://doi.org/10.3846/TEDE.2019.10294>
- Jiang, H., Habib, A., & Hu, B. (2011). Ownership concentration, voluntary disclosures and information asymmetry in New Zealand. *The British Accounting Review*, 43(1), 39–53. <https://doi.org/10.1016/j.bar.2010.10.005>
- Khanchel, I., & Lassoued, N. (2022). ESG disclosure and the cost of capital: Is there a ratcheting effect over time? *Sustainability (Switzerland)*, 14(15), 9237. <https://doi.org/10.3390/su14159237>
- Kim, S., Kim, S., Lee, D., & Yoo, S. (2019). How investors perceive mandatory audit firm rotation in Korea. *Sustainability*, 11(4), 1089. <https://doi.org/10.3390/su11041089>
- Kock, C. J., Santaló, J., & Diestre, L. (2012). Corporate governance and the environment: What type of governance creates greener companies? *Journal of Management Studies*, 49(3), 492–514. <https://doi.org/10.1111/j.1467-6486.2010.00993.x>
- Kothari, S. P., Li, X., & Short, J. E. (2009). The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. *The Accounting Review*, 84(5), 1639–1670. <https://doi.org/10.2308/accr.2009.84.5.1639>
- Kuo, L., Kuo, P.-W., Chen, C.-C., Ramkissoon, H., & Tsai, W.-H. (2021). Mandatory CSR disclosure, CSR assurance, and the cost of debt capital: Evidence from Taiwan. *Sustainability*, 13(4), 1768. <https://doi.org/10.3390/SU13041768>
- Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research*, 45(2), 385–420. <https://doi.org/10.1111/j.1475-679X.2007.00238.x>
- Landi, G., & Sciarrelli, M. (2019). Towards a more ethical market: The impact of ESG rating on corporate financial performance. *Social Responsibility Journal*, 15(1), 11–27. <https://doi.org/10.1108/SRJ-11-2017-0254>
- Larcker, D., & Rusticus, T. (2010). On the use of instrumental variables in accounting research. *Journal of Accounting and Economics*, 49(3), 186–205. <https://doi.org/10.1016/j.jacceco.2009.11.004>

- Leuz, C., Lins, K. V., & Warnock, F. E. (2009). Do foreigners invest less in poorly governed firms? *Review of Financial Studies*, 22(8), 3245–3285. <https://doi.org/10.1093/rfs/hhn089>
- Li, Y., Foo, C. T., Li, Y., & John Ferguson, P. (2015). A sociological theory of corporate finance: Societal responsibility and cost of equity in China. *Chinese Management Studies*, 9(3), 269–294. <https://doi.org/10.1108/cms-12-2014-0232>
- Li, Y., Gong, M., Zhang, X. Y., & Koh, L. (2018). The impact of environmental, social, and governance disclosure on firm value: The role of CEO power. *The British Accounting Review*, 50(1), 60–75. <https://doi.org/10.1016/j.BAR.2017.09.007>
- Li, L., Liu, Q., Tang, D., & Xiong, J. (2017). Media reporting, carbon information disclosure, and the cost of equity financing: Evidence from China. *Environmental Science and Pollution Research*, 24(10), 9447–9459. <https://doi.org/10.1007/s11356-017-8614-4>
- Linnenluecke, M. K. (2022). Environmental, social and governance (ESG) performance in the context of multinational business research. *Multinational Business Review*, 30(1), 1–16. <https://doi.org/10.1108/MBR-11-2021-0148>
- Lopez, B., Rangel, C., & Fernández, M. (2022). The impact of corporate social responsibility strategy on the management and governance axis for sustainable growth. *Journal of Business Research*, 150, 690–698. <https://doi.org/10.1016/j.jbusres.2022.06.025>
- Luo, L., & Tang, Q. (2014). Does voluntary carbon disclosure reflect underlying carbon performance? *Journal of Contemporary Accounting & Economics*, 10(3), 191–205. <https://doi.org/10.1016/j.jcae.2014.08.003>
- Maaloul, A., Zéghal, D., Ben Amar, W., & Mansour, S. (2021). The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. *Corporate Reputation Review*, 1–18. <https://doi.org/10.1057/S41299-021-00130-8/METRICS>
- Nazir, M., Akbar, M., Akbar, A., Poulou, P., Hussain, A., & Qureshi, M. A. (2022). The nexus between corporate environment, social, and governance performance and cost of capital: Evidence from top global tech leaders. *Environmental Science and Pollution Research*, 29(15), 22623–22636. <https://doi.org/10.1007/s11356-021-17362-0>
- Ng, A. C., & Rezaee, Z. (2015). Business sustainability performance and cost of equity capital. *Journal of Corporate Finance*, 34, 128–149. <https://doi.org/10.1016/j.jcorpfin.2015.08.003>
- Nirino, N., Miglietta, N., & Salvi, A. (2020). The impact of corporate social responsibility on firms' financial performance, evidence from the food and beverage industry. *British Food Journal*, 122(1), 1–13. <https://doi.org/10.1108/BFJ-07-2019-0503>
- Nirino, N., Santoro, G., Miglietta, N., & Quaglia, R. (2021). Corporate controversies and company's financial performance: Exploring the moderating role of ESG practices. *Technological Forecasting and Social Change*, 162, 120341. <https://doi.org/10.1016/J.TECHFORE.2020.120341>
- Ohlson, J. A., & Juettner-Nauroth, B. E. (2005). Expected EPS and EPS growth as determinants of value. *Review of Accounting Studies*, 10(2–3), 349–365. <https://doi.org/10.1007/s11142-005-1535-3>
- Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3), 403–441. <https://doi.org/10.1177/0170840603024003910>
- Paolone, F., Cucari, N., Wu, J., & Tiscini, R. (2022). How do ESG pillars impact firms' marketing performance? A configurational analysis in the pharmaceutical sector. *Journal of Business & Industrial Marketing*, 37(8), 1594–1606. <https://doi.org/10.1108/JBIM-07-2020-0356>
- Pindyck, R. S. (1988). Capital risk and models of investment behaviour. In *Economic modelling in the OECD countries* (pp. 103–117). Springer. https://doi.org/10.1007/978-94-009-1213-7_6
- Plumlee, M., Brown, D., Hayes, R. M., & Marshall, R. S. (2015). Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy*, 34(4), 336–361. <https://doi.org/10.1016/j.jaccpubpol.2015.04.004>
- Poshakwale, S., & Courtis, J. K. (2005). Disclosure level and cost of equity capital: Evidence from the banking industry. *Managerial and Decision Economics*, 26(7), 431–444. <https://doi.org/10.1002/mde.1256>
- Prasad, K., Kumar, S., Devji, S., Lim, W. M., Prabhu, N., & Moodbidri, S. (2022). Corporate social responsibility and cost of capital: The moderating role of policy intervention. *Research in International Business and Finance*, 60, 101620. <https://doi.org/10.1016/J.RIBAF.2022.101620>
- Raimo, N., Caragnano, A., Zito, M., Vitolla, F., & Mariani, M. (2021). Extending the benefits of ESG disclosure: The effect on the cost of debt financing. *Corporate Social Responsibility & Environmental Management*, 28(4), 1412–1421. <https://doi.org/10.1002/csr.2134>
- Ramirez, A. G., Monsalve, J., González-Ruiz, J. D., Almonacid, P., Ramirez, A. G., Monsalve, J., David González-Ruiz, J., Almonacid, P., & Peña, A. (2022). Relationship between the cost of capital and environmental, social, and governance scores: Evidence from Latin America. *Sustainability*, 14(9), 5012. <https://doi.org/10.3390/SU14095012>
- Reverte, C. (2009). Do better governed firms enjoy a lower cost of equity capital? Evidence from Spanish firms. *Corporate Governance: The International Journal of Business in Society*, 9(2), 133–145. <https://doi.org/10.1108/14720700910946587>
- Reverte, C. (2012). The impact of better corporate social responsibility disclosure on the cost of equity capital. *Corporate Social Responsibility & Environmental Management*, 19(5), 253–272. <https://doi.org/10.1002/csr.273>
- Richardson, A. J., & Welker, M. (2001). Social disclosure, financial disclosure and the cost of equity capital. *Accounting, Organizations & Society*, 26(7–8), 597–616. [https://doi.org/10.1016/S0361-3682\(01\)00025-3](https://doi.org/10.1016/S0361-3682(01)00025-3)
- Ross, S. A. (1973). The Economic theory of agency: The principal's problem. *The American Economic Review*, 63(2), 134–139. <https://www.jstor.org/stable/1817064>
- Serrano, A., Oliva, R., & Kraiselburd, S. (2017). On the cost of capital in inventory models with deterministic demand. *International Journal of Production Economics*, 183, 14–20. <https://doi.org/10.1016/j.ijpe.2016.10.007>
- Shanyu, L. (2022). Corporate social responsibilities (CSR) and sustainable business performance: Evidence from BRICS countries. *Economic Research-Ekonomska Istraživanja*, 35(1), 6105–6120. <https://doi.org/10.1080/1331677X.2022.2047085>
- Sila, I., & Cek, K. (2017). The impact of environmental, social and governance dimensions of corporate social responsibility on Economic performance: Australian evidence. *Procedia Computer Science*, 120, 797–804. <https://doi.org/10.1016/J.PROCS.2017.11.310>

- Snihur, Y., & Bocken, N. (2022). A call for action: The impact of business model innovation on business ecosystems, society and planet. *Long Range Planning*, 55(6), 102182. <https://doi.org/10.1016/J.LRP.2022.102182>
- Taliento, M., Favino, C., & Netti, A. (2019). Impact of environmental, social, and governance information on economic performance: Evidence of a corporate “sustainability advantage” from Europe. *Sustainability (Switzerland)*, 11(6). <https://doi.org/10.3390/SU11061738>
- Tamimi, N., & Sebastianelli, R. (2017). Transparency among S&P 500 companies: An analysis of ESG disclosure scores. *Management Decision*, 55(8), 1660–1680. <https://doi.org/10.1108/MD-01-2017-0018>
- Tang, H. (2022a). The effect of ESG performance on corporate innovation in China: The mediating role of financial constraints and agency cost. *Sustainability*, 14(7), 3769. <https://doi.org/10.3390/su14073769>
- Tang, H. (2022b). ESG performance, investors’ heterogeneous beliefs, and cost of equity capital in China. *Frontiers in Environmental Science*, 10, 2421. <https://doi.org/10.3389/fenvs.2022.992559>
- Wu, H. (2014). Disclosure of environmental information, environmental performance and cost of equity capital. *Journal of Xiamen University (Arts & Social Science)*, 3, 129–138 Accessed 09 02 2023 https://scholar.google.com/scholar_lookup?title=Disclosure%20of%20environmental%20information%2C%20environmental%20performance%20and%20cost%20of%20equity%20capital&publication_year=2014&author=H.J.%20Wu
- Wu, S., Li, X., Du, X., & Li, Z. (2022). The impact of ESG performance on firm value: The moderating role of ownership structure. *Sustainability*, 14(21), 14507. <https://doi.org/10.3390/SU142114507>
- Xu, S., Liu, D., & Huang, J. (2015). Corporate social responsibility, the cost of equity capital and ownership structure: An analysis of Chinese listed firms. *Australian Journal of Management*, 40(2), 245–276. <https://doi.org/10.1177/0312896213517894>
- Yan, S., Na, W., Yu, X., & Zhang, X. (2022). Regulation intensity, environmental disclosure, and cost of capital: Evidence from listed firms in China. *Environmental Science and Pollution Research*, 30(5), 12283–12306. <https://doi.org/10.1007/s11356-022-22845-9>
- Yesuf, A. J., & Aassouli, D. (2020). Exploring synergies and performance evaluation between Islamic funds and socially responsible investment (SRIs) in light of the sustainable development goals (SDGs). *Heliyon*, 6(8), e04562. <https://doi.org/10.1016/j.heliyon.2020.e04562>
- Yi, Y., Xie, B., Zhou, L., Wei, Y., & Gherghina, S. C. (2020). Does CSR affect the cost of equity capital: Empirical evidence from the targeted poverty alleviation of listed companies in China. *PLOS ONE*, 15(2), e0227952. <https://doi.org/10.1371/journal.pone.0227952>
- Zhai, Y., Cai, Z., Lin, H., Yuan, M., Mao, Y., & Yu, M. (2022). Does better environmental, social, and governance induce better corporate green innovation: The mediating role of financing constraints. *Corporate Social Responsibility and Environmental Management*, 29(5), 1513–1526. <https://doi.org/10.1002/CSR.2288>
- Zsóka, Á., & Vajkai, É. (2018). Corporate sustainability reporting: Scrutinising the requirements of comparability, transparency and reflection of sustainability performance. *Society and Economy*, 40(1), 19–44. <https://doi.org/10.1556/204.2018.40.1.3>