

CORPORATE GOVERNANCE AND FIRM PERFORMANCE IN LISTED COMPANIES: EVIDENCE FROM CHINA

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Abstract

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This research examines the relationship between corporate governance and firm performance in listed companies within China's Greater Bay Area (GBA), analyzing data from the Hang Seng and Shenzhen Component Indices from 2015 to 2021 (Alzubi & Bani-Hani, 2021). A sample of 30 firms from Hong Kong and Shenzhen is investigated, considering corporate governance as the independent variable and return on assets (ROA), return on equity (ROE), and Tobin's Q as dependent variables. Control variables include firm size, age, board size, and the engagement of an external auditor from the Big Four. Findings reveal a 58 percent governance level in the Hong Kong and Shenzhen exchanges, consistent with prior studies (Buallay et al., 2017). Despite this, the research shows no significant impact of corporate governance on operating and financial performance, and factors such as the largest shareholder's ownership, board independence, and board size do not significantly influence firm performance. In light of these findings and limitations such as aggregated data and limited sample size, the necessity for further research is underscored.

Keywords: Corporate Governance, Financial Statistics, Firm Performance, China, the Greater Bay Area, Hong Kong, Shenzhen

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1. INTRODUCTION

Corporate governance, encompassing an array of policies, procedures, and regulations, plays a crucial role in determining business transparency, fairness, and stakeholder alignment, substantially influencing firms' performances (Alodat et al., 2022). Additionally, sound governance practices are recognized as providing a competitive edge to companies. Yet, the link between corporate governance and firm performance has been relatively under-investigated, especially within distinct institutional environments such as those of Hong Kong and Shenzhen, two cities located in China's Greater Bay Area (GBA). Significant differences exist in corporate governance

regulations between Hong Kong and Mainland China, particularly for non-listed non-state-owned enterprises, necessitating further research (Molnar et al., 2017).

This study seeks to bridge this research gap by closely examining the impact of corporate governance on firm performance in Hong Kong and Shenzhen's interconnected yet distinct economic landscapes. This line of inquiry aligns with Alzubi and Bani-Hani's (2021) exploration into the relationship between capital structure and performance in Jordanian-listed firms, offering valuable insights to inform policy-making and investment choices. Moreover, this study echoes the emphasis laid by Ulfah et al. (2022) on the influence of board structure on earnings management, underlining

the significance of corporate governance mechanisms in shaping firm performance within the dynamic GBA business milieu (Ulfah et al., 2022).

Drawing on Konstantinidis et al.'s (2022) strategy of evaluating competitiveness as a strategic advisory factor, this study's central research question is:

RQ: What is the influence of corporate governance on the performance of firms listed in China's GBA, specifically in Hong Kong and Shenzhen?

To answer this question, data from the Hang Seng Index and Shenzhen Component Index spanning from 2015 to 2021 are analyzed, focusing on 30 companies from each city. Corporate governance is examined as the independent variable, and return on equity (ROE), return on assets (ROA), and Tobin's Q (Tobin, 1969) are assessed as the dependent variables (Alodat et al., 2022). Control variables include firm size, firm age, board size, and the engagement of a Big Four external auditor.

The findings indicate a 58% level of governance in line with previous studies (Buallay et al., 2017). However, in contrast to the initial hypotheses, corporate governance does not significantly influence operating and financial performances. This result underscores the need for further investigation into other factors beyond governance, potentially impacting firm performance.

The rest of this paper is structured as follows. Section 2 reviews pertinent literature and identifies gaps in the existing research. Section 3 delineates the research methodology. Section 4 presents the results and Section 5 discusses their implications. Finally, Section 6 concludes the paper and recommends possible directions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Corporate governance is vital for attracting investment and building shareholder trust in firms, reducing investor risk, improving capital access, and positively influencing business outcomes (Guo & Kga, 2012; Rezaee, 2009). Independent boards and ethical business practices enhance market confidence and functionality (Guo & Kga, 2012). As such, it is an important aspect of business not only to be considered by firms seeking these benefits but also to be thoroughly investigated and researched scientifically for a deeper understanding to better inform investment and policy-making decisions.

The relationship between corporate governance and firm performance, measured by ROE, ROA, and Tobin's Q, has been widely explored (Ahmed & Hamdan, 2015; Kiel & Nicholson, 2003). However, research on this topic in the Guangdong-Hong Kong-Macau GBA, a significant driver of China's economic growth, remains scarce. With a gross domestic product (GDP) of US\$1.68 trillion and a population of 70 million, the investment in GBA companies relies heavily on corporate governance. Despite its economic significance, research on corporate governance's impact on companies within the region is scant. However, studies on the topic in other emerging markets like Jordan show a positive correlation between effective corporate governance practices and firm performance (Alodat et al., 2022). Similarly, research in Italy (Lagasio, 2021), Egypt

(Ismaeel & Soliman, 2022), and Ghana (Onyina & Gyanor, 2019) provides insights into the role of corporate governance in different markets. These studies could offer invaluable insights into the GBA context, guiding decisions related to economic growth and investment.

2.1. Corporate governance and operational performance

The correlation between corporate governance and operational performance remains a complex topic with diverse findings. In a study of non-financial institutions in Jordan from 2008 to 2019, Marashdeh, Alomari, Aleqab, et al. (2021) used random effects regression to uncover various relationships. They found chief executive officer (CEO) duality to negatively impact performance, in line with Rechner and Dalton's (1991) arguments, while smaller boards were found to boost performance, echoing Yermack's (1996) observations. Similarly, non-executive directors (NEDs) were found to enhance monitoring functions, aligning with Weir and Laing (2001) and Abdullah (2004). The limitations of Marashdeh, Alomari, Aleqab, et al.'s (2021) study, however, include the exclusion of other sectors, nuances in operationalizations of variables such as board meetings, and a lack of comparisons with similar emerging markets.

Nguyen et al. (2022) examined the influence of internal control on the performance of non-financial listed firms in Vietnam. They found that governance characteristics such as board size, CEO duality, CEO tenure, and the presence of NEDs showed variation across contexts, corroborating the findings of Fama and Jensen (1983), Dalton et al. (1998), Lipton and Lorsch (1992), Morck et al. (1988), Adams et al. (2005), Abdullah (2004), Fischer and Schornberg (2007), and Abdulayev (2022). The study, while offering insights specific to the Vietnamese context, called for further research involving additional sectors and variables.

Ulfah et al. (2022) studied the effect of board structure on earnings management in Indonesian firms before and during the COVID-19 pandemic. They found that only board size significantly influenced earnings management, with larger boards being less effective before the pandemic but more effective during it. This underscores the changing role of board structures during economic crises. Despite its contribution to the literature, the study's single-country focus and exclusion of financial firms limit its generalizability, underlining the need for cross-country analyses.

Studies on the relationship between ownership structure and firm performance have produced different results in different countries. For instance, Al-Matari et al. (2012) found no significant relationship between family ownership and firm performance in Saudi-listed companies, while Khamis et al. (2015) reported a negative impact of institutional ownership and a positive effect of managerial ownership in Bahraini-listed companies. Onakoya et al. (2014) found a positive relationship between ownership structure and board size with ROE but a negative association with ROA in Nigerian banks. Fooladi and Nikzad Chaleshtori (2011) identified various ways in which corporate governance mechanisms influence bank performance,

including negative effects from loan deposit ratios and poor asset quality, and negative associations with ROE and ROA in Malaysian firms. In contrast, Sami et al. (2011) found a positive relationship between corporate governance measures and operational performance in China.

In light of these findings, Onyina and Gyanor's (2019) study on the impact of corporate governance practices on the performance of firms listed on the Ghana Stock Exchange becomes relevant. Their study, however, did not find statistically compelling evidence that listed corporate governance variables affect the performance of listed firms.

This study aims to explore the relationship between corporate governance and operational performance in the Guangdong-Hong Kong-Macao GBA of China, using ROE and ROA as performance indicators. The hypothesis is that the adoption of corporate governance has no significant impact on operational performance, focusing on GBA-listed companies due to their economic significance and ongoing governance reforms. Therefore, the first hypothesis is:

H1: There is no significant impact of corporate governance adoption on a firm's operational performance.

2.2. Corporate governance and financial performance

Corporate governance has been consistently linked with financial performance, with notable effects on numerous factors like board size, firm size, blockholders, and audit committees (Danoshana & Ravivathani, 2019; Afrifa & Tauringana, 2015; Gupta & Sharma, 2014; Najjar, 2012). However, the influence of these variables varies across different industries and countries, underscoring the need for context-specific investigations.

A study by Alzubi and Bani-Hani (2021) explored the determinants of debt-to-equity ratio's impact on industrial firms in Jordan. The study, while providing support for aspects of the pecking order, trade-off, and agency cost theories, has been critiqued for its methodological limitations and inconsistency with previous research like Kashefi Pour (2011). The sample constraints limited the study's generalizability, and the researchers did not fully discuss these limitations or the divergences from prior work.

A literature review by Konstantinidis et al. (2022) examined competitiveness estimation for manufacturing firms, analyzing 50 articles published over several decades. The review incorporated studies focusing on relationships between profitability, market share, productivity, exports, concentration, and competitiveness, with additional variables like firm size, risk, tangibility, and liquidity (Alipour et al., 2015; Tamulyte, 2012). However, the review's value could have been enhanced with a broader search strategy, in-depth methodological discussions, and a more thorough exploration of inconsistencies across studies.

The significance of corporate governance in financial performance has been emphasized in global contexts. Mitton (2002) highlighted the positive effects of governance during the East Asian Financial Crisis, and von Nandelstadh and Rosenberg (2003) found a correlation between effective governance and higher profits.

Given these findings and the importance of corporate governance in financial performance, this study investigates its impact on companies listed in the GBA, an innovation hub providing a unique context. The study examines the influence of corporate governance adoption on financial performance, using ROE and ROA as indicators (Onyina & Gyanor, 2019). The second proposed hypothesis is:

H2: There is no significant impact of corporate governance adoption on a firm's financial performance.

2.3. Corporate governance and market performance

Numerous global studies have delved into the influence of corporate governance on firm performance using a variety of metrics. Fallatah and Dickins (2012) established a positive relationship between corporate governance and the value of Saudi-listed companies through Tobin's Q. Likewise, Al-Ghamdi and Rhodes (2015) found a significant positive link between family ownership and corporate governance in Saudi-listed firms using the same measure. Conversely, Al-Matari et al. (2012) found no significant impact of internal corporate governance mechanisms on the performance of Saudi companies. For Bahraini-listed companies, Khamis et al. (2015) found a negative relationship between institutional ownership and performance measured through Tobin's Q, though managerial ownership positively affected performance. Siddiqui's (2015) meta-analysis reinforced the significant positive link between external governance, measured via anti-takeover provisions, and firm value based on Tobin's Q.

Extending this body of work, this study investigates the effect of corporate governance on market performance using ROE and ROA. The focus is on GBA-listed companies and the dynamic interplay between corporate governance and market performance, putting forth the third hypothesis:

H3: There is no significant impact of corporate governance adoption on a firm's market performance.

2.4. Hypotheses development

The first hypothesis (*H1*) of this research states that corporate governance adoption has no significant impact on a firm's operational performance.

This study explores the relationship between corporate governance and operational performance in GBA firms, a topic that has yielded inconclusive results in prior research conducted in other regions. Ahmed and Hamdan (2015) observed a positive correlation in Bahraini-listed firms, while Buallay et al. (2017) found no significant link in the Saudi Stock Exchange. The aim is to bridge this gap by examining the correlation, or lack thereof, in GBA-listed companies using suitable metrics and statistical methods. The outcomes provide critical insights for GBA stakeholders, enriching the comprehension of corporate governance's impact on firm performance (Onyina & Gyanor, 2019).

The second hypothesis (*H2*) states that corporate governance adoption has no significant impact on a firm's financial performance.

The study explores the relationship between corporate governance and financial performance in

GBA firms. Mitton's (2002) study revealed a significant link between corporate governance and firm performance in various Asian nations post-East Asian Crisis, yet Buallay et al.'s (2017) research on Saudi-listed firms did not find a strong connection. Given the geographical differences, the generalizability of these findings to other regions is uncertain. This paper investigates the correlation between corporate governance and financial performance in the GBA. The hypothesis is tested using suitable metrics and statistical methods for listed GBA firms. Such an examination provides valuable insights for GBA policymakers, investors, and stakeholders and adds to the ongoing discussions on corporate governance and firm performance.

The third hypothesis (*H3*) states that corporate governance adoption has no significant impact on a firm's market performance.

This study explores the relationship between corporate governance and firm performance in Hong Kong and Shenzhen, informed by discrepancies in global findings. Buallay et al. (2017) identified a significant correlation between corporate governance, shareholder ownership, and board size on firm performance, whereas Al-Matari et al. (2012) and Khamis et al. (2015) found no such link in Saudi Arabia and the Gulf Cooperation Council (GCC) nations. Given less stringent corporate governance in Asian firms, this study posits that corporate governance may not notably impact financial, operational, and market performance in the GBA (Onyina & Gyanor, 2019).

3. RESEARCH METHODOLOGY

This study analyses 30 stocks listed on Hong Kong's Hang Seng Index and 30 stocks listed on the Shenzhen Component Index from 2015 to 2021. The sample includes companies from the banking and financial services, utilities, building and construction, and industrial and commerce sectors. The study examines the influence of corporate governance on financial, operational, and market performance using ROE, ROA, and Tobin's Q. Regression analysis is used to assess the impact of corporate governance on each performance dimension.

3.1. Population sample and resources of data

The study population sample and resources of data are as follows. Table 1a provides the sample selection of companies from different sectors listed on the Hong Kong and Shenzhen stock exchanges. It shows the number of companies selected from each sector for both exchanges as well as the total number of companies in the study population from each sector and in total. There are 10 listed companies selected from the banks and financial services sector from both the Hong Kong and Shenzhen stock exchanges, resulting in a total of 20 companies in the study population for that sector. Similarly, 5 companies each are selected from the utilities sector listed on both exchanges, amounting to a total of 10 companies for that sector in the study population; 8 companies each from the building and construction sector; and 7 companies each from the industry and commerce sector listed on the Hong Kong and Shenzhen stock exchanges are included, with sector totals of 16 and 14 companies, respectively. In aggregate, the sample

incorporates 30 companies listed on the Hong Kong Stock Exchange and 30 companies listed on the Shenzhen Stock Exchange, resulting in a total of 60 companies in the overall study population.

Table 1b provides further financial details on the market value of the selected companies comprising the study population, accurate at the time of data collection. It shows the market value in Hong Kong dollars (HKD) of companies from each sector listed on the Hong Kong and Shenzhen stock exchanges, as well as the total market value for each sector and in aggregate. For example, companies from the banks and financial services sector listed in Hong Kong had a combined market value of HKD8,616.040 billion, while those listed in Shenzhen had a market value of HKD1,052.068 billion, giving a total sector market value of HKD9,668.108 billion. Corresponding market values for other sectors and the overall market values of all companies listed on each exchange and collectively are also presented.

The total market value of the sample of 30 listed companies in Hong Kong was HKD18,280.040 billion compared to HKD5,046.450 billion for the sample of 30 listed companies in Shenzhen. The banking and financial services sector had the highest value in Hong Kong (HKD8,616.040 billion), while utilities were the highest in Shenzhen (HKD227.203 billion). Overall, companies listed in Hong Kong tended to have higher market values than those listed in Shenzhen across the various sectors. The sample represented approximately 82% of the Hang Seng Index and 48% of the Shenzhen Component Index by market value.

Table 1a. Sample selection: Population

Sector	Study population		Total population
	Hong Kong	Shenzhen	
Bank and financial services	10	10	20
Utilities	5	5	10
Building and construction	8	8	16
Industry and commerce	7	7	14
Total	30	30	60

Table 1b. Sample selection: Market value

Sector	Market value (HKD billion)		Total market value (HKD billion)
	Hong Kong	Shenzhen	
Bank and financial services	8,616.040	1,052.068	9,668.108
Utilities	564.676	227.203	791.879
Building and construction	1,212.214	429.334	1,641.548
Industry and commerce	7,887.108	3,337.843	11,224.951
Total	18,280.038	5,046.448	23,326.486
Total in Stock Market	22,292.732	10,561.474	32,854.206
% in all the Stock Exchange Market	82%	48%	71%

Note: Data was collected on November 23, 2022.

3.2. Study model

This study presents three hypotheses, necessitating the development of a fitting model to ascertain their validity. This model takes inspiration from Buallay et al.'s (2017) research, which investigated the link between corporate governance and company performance in Saudi Arabia. The research model employed in this study aligns with their approach,

while also incorporating unique elements from the study executed by Alzubi and Bani-Hani (2021). This layered methodology aims to provide a comprehensive analysis of the hypotheses presented.

$$Perf_{it} = \beta_0 + \beta_1 CG1_{it} + \beta_2 CG2_{it} + \beta_3 CG3_{it} + \beta_4 CG4_{it} + \beta_5 CG5_{it} + \beta_6 LnAssets_{it} + \beta_7 Age_{it} + \beta_8 Big4_{it} + \beta_9 BSize_{it} + \beta_{10} Sector_{it} + \varepsilon_{it} \quad (1)$$

where,

- $Perf_{it}$ is a continuous variable; the dependent variable is the firm performance measured by three models: a) ROA_{it} is the ratio of net income divided by total assets, for the company (i), in the period (t); b) ROE_{it} is a continuous variable; the dependent variable is the ratio of net income divided by shareholders' equity, for the company (i), in the period (t); and c) $Tobin's Q_{it}$ is a continuous variable; the dependent variable is the ratio of current liabilities plus market value of share capital divided by total assets, for the company (i), in the period (t).

- β_0 is the constant.

- β_{1-10} is the slope of the controls and independent variables.

- $CG1_{it}$ is a dummy variable, bladed 0 if a shareholder has shares more than 20% and bladed 1 otherwise, for the company (i), in the period (t).

- $CG2_{it}$ is a dummy variable, bladed 0 if the largest three shareholders have shares of more than 50% when combined and bladed 1 otherwise, for the company (i), in the period (t).

- $CG3_{it}$ is a dummy variable, bladed 0 if the board of directors' members are not between 7 and 13 members and bladed 1 otherwise, for the company (i), in the period (t).

- $CG4_{it}$ is a dummy variable, bladed 0 if the board of directors' members are not controlled by greater than 50% independent outside directors and bladed 1 otherwise, for the company (i), in the period (t).

- $CG5_{it}$ is a dummy variable, bladed 0 if the chairman is also the CEO and bladed 1 otherwise, for the company (i), in the period (t).

- $LnAssets_{it}$ is a logarithmic variable, the total assets of the company, for the company (i), in the period (t).

- Age_{it} is a continuous variable, the number of years since the company was established, for the company (i), in the period (t).

- $Big4_{it}$ is a dummy variable, the company's external auditor one of the Big Four audit firms, for the company (i), in the period (t).

- $BSize_{it}$ is a continuous variable, the number of board of directors members in the company, for the company (i), in the period (t).

- $Sector_{it}$ is a dummy variable, the area of the economy in which companies work in the same field or have related products or services, for the company (i), in the period (t).

- ε_{it} is a random error.

3.3. Measurement of variables and descriptive statistics

3.3.1. Dependent variables

This proposal assesses corporate governance's impact on financial, operational, and market performance, employing proxy variables suggested

The study employs the following linear regression models to assess the association between corporate governance and corporate performance in listed companies located in Hong Kong and Shenzhen:

by Buallay et al. (2017): ROE for financial performance, ROA for operational performance (Danoshana & Ravivathani, 2019), and $Tobin's Q$ for market performance (Kiel & Nicholson, 2003). These measurements facilitate insights into the corporate governance-performance relationship, aligning with previous research methodologies.

ROE gauges the profitability of a firm in relation to its net assets, serving as a critical metric for assessing executive returns on shareholders' equity (Ulfah et al., 2022). However, industries with lower capital investments, such as consulting, may display high ROEs without necessarily being more profitable (Konstantinidis et al., 2022). Conversely, capital-intensive industries like oil refineries demand hefty infrastructure investments, creating high entry barriers and reduced competition, despite potentially lower ROEs (Nguyen et al., 2023). Hence, ROE alone may not provide a comprehensive profitability assessment across varied industries (Marashdeh, Alomari, Aleqab, et al., 2021).

ROA measures operating performance by assessing profit generated from creditor and owner equity. A high ROA signifies efficient corporate asset utilization, indicating enhanced profitability and overall enterprise performance (Alzubi & Bani-Hani, 2021; Nguyen et al., 2023). It reflects effective corporate management.

$Tobin's Q$, a market performance metric, compares a firm's stock market value to its net book value, offering insights into market valuation versus intrinsic value, and aiding in identifying overvalued or undervalued businesses or markets (Tobin, 1969). A $Tobin's Q$ below one suggests undervaluation, while above one signifies overvaluation. In China's monetary policy context, $Tobin's Q$ can serve as a critical tool for research and policymaking by providing insights into investment efficiency, although its application is limited due to the underdeveloped capital market there. Despite this, $Tobin's Q$ can enhance financial analysis, contributing to comprehensive decision-making processes.

3.3.2. Independent variable

The independent variable, *corporate governance* (CG), encompasses various factors, such as largest shareholder ownership, top three shareholders' ownership, board size, board independence, and local residency of chairman and CEO (Buallay et al., 2017; Bouaziz, 2014; Barros et al., 2013; Hamdan et al., 2013). The broader context of corporate governance, such as the impact on firm performance as highlighted by Onyina and Gyanor (2019), should be considered when applying these factors beyond East Asia.

The first dimension of corporate governance ($CG1$) focuses on the largest shareholder's ownership. In East Asian markets, a significant portion, around 65%, of listed companies are

controlled by major shareholders, with approximately 60% of managers being family members of these major shareholders (Bruton et al., 2003). This is a common feature of Hong Kong companies due to the rise of family businesses from the 1950s to the 1970s, with many reaching a mature development stage. It is advisable for any single shareholder's ownership not to exceed 20%, as this approach is more conducive to company development (see Table 2).

The second dimension of corporate governance (CG2) involves the shareholding ratio of the top three shareholders. A value of zero is assigned if the combined ratio of the largest three shareholders exceeds 50%. Otherwise, it is assigned one. Prior research indicates that companies emphasizing control by multiple shareholders often exhibit robust monitoring capabilities. This analysis suggests that the shareholding ratio of the top three shareholders should not surpass 50%, as it is more likely to facilitate company development. This recommendation aligns with the findings by Akhtaruddin et al. (2009) and Buallay et al. (2017) as outlined in Table 2.

The third dimension of corporate governance (CG3) relates to board size, which has been extensively discussed in existing literature. Research indicates that boards with seven to 13 members tend to be more effective, as larger boards can encounter challenges in reaching agreements and decision-making (Hamdan & Al-Sartawi, 2013). Therefore, it is recommended that the number of board members should range between 7 and 13 for optimal company development, as outlined in Table 2.

The fourth dimension of corporate governance (CG4) assesses board independence. A score of zero is given if the board comprises less than 50%

independent outside directors or one if otherwise. A majority of independent board members is crucial for effective governance. Failing to achieve this may reduce information transparency and lead to conflicts of interest. Hence, it is recommended that more than 50% of the board consists of independent external directors, promoting the company's development (Bouaziz, 2014; Buallay et al., 2017) (see Table 2).

The fifth dimension of corporate governance (CG5) concerns the CEO and chairman roles. A score of zero is given if one person holds both positions or one if otherwise. Combining the roles of chairman and CEO can result in conflicts of interest and false disclosure (Abbadi et al., 2016; Bouaziz, 2014; Khiari, 2013; Shanikat & Abbadi, 2011). While this practice is common in Saudi-listed companies, it creates a conflict of interest as the CEO votes on their own compensation, and the chair can influence board activities. To enhance board governance, it is recommended that the chairman and CEO positions be separate, preventing potential abuses of power and enhancing corporate governance oversight (see Table 2).

3.3.3. Control variables

In all the estimation models examined, the study includes four control variables: *firm size* (total assets) and *firm age* (Ahmed & Hamdan, 2015), *board size* (Guo & Kga, 2012), and external auditors being one of the *Big Four* auditing firms (Barros et al., 2013; Yaşar, 2013). Table 2 presents a summary of the measurements for the dependent, independent, and control variables.

Table 2. Variables labels, measurement, and description

Dependent variables	Mean			Standard deviation					
	HK	SZ	GBA	HK	SZ	GBA			
ROE (the ratio of net income divided by shareholders' equity)	10.19%	7.43%	8.81%	8.74%	15.76%	12.82%			
ROA (the ratio of net income divided by total assets)	30.18%	14.25%	22.22%	23.94%	47.29%	28.29%			
Tobin's Q (the ratio of net income divided by total assets)	59.95%	68.27%	64.11%	27.02%	18.30%	23.69%			
Independent variables	Mean						Standard deviation		
	HK		SZ		GBA		HK	SZ	GBA
	0	1	0	1	0	1			
CG1 (bladed 0 if a shareholder has shares more than 20%)	63%	37%	70%	30%	67%	33%	48.19%	45.83%	47.14%
CG2 (bladed 0 if the largest three shareholders have shares of more than 50% when combined)	33%	67%	10%	90%	22%	78%	47.14%	30.00%	41.20%
CG3 (bladed 0 if the board members are not between seven and 13 members)	40%	60%	66%	34%	53%	47%	48.99%	47.14%	49.89%
CG4 (bladed 0 if the board of directors members is not comprised of more than 50% independent outside directors)	100%	0%	100%	0%	100%	0%	0.00%	0.00%	0.00%
CG5 (bladed 0 if the chairman is also the CEO)	27%	73%	33%	67%	30%	70%	44.22%	47.14%	45.83%
Control variables	Mean						Medium		
	HK		SZ		GBA		HK	SZ	GBA
Total assets (RMB100 million)	53,627.94		5,090.4		29,359.17		7,446.34	2,327.61	3,442.51
Age	32		27		30		23	27	25
Big Four	100%		43%		28%		N/A	N/A	N/A
Board size	18		10		14		20	10	12

Note: A larger standard deviation means that most values are more different from their mean; a smaller standard deviation means that these values are closer to the mean. HK — Hong Kong; SZ — Shenzhen; GBA — China's Greater Bay Area.

3.4. Alternative methods

Qualitative methods, such as interviews and case studies, can serve as alternatives to quantitative regression analysis. Interviews with managers from

high and low-performing firms, selected based on ROE, ROA, and Tobin's Q, can offer deeper insights into corporate governance's direct impact on performance within diverse firm contexts. Combining qualitative interviews with quantitative

analysis may provide a more nuanced understanding of the corporate governance-performance relationship in Hong Kong and Shenzhen markets, complementing regression models (Buallay et al., 2017).

4. RESULTS

Hong Kong demonstrates stronger performance across multiple areas compared to Shenzhen. Table 2 above shows that Hong Kong-listed companies outperform Shenzhen-listed companies in ROE, ROA, Tobin's Q, and corporate governance practices.

4.1. Dependent variables

4.1.1. Return on equity (ROE)

This study compares the mean ROE of 30 listed companies in Hong Kong and 30 in Shenzhen, revealing the GBA's mean ROE to be 8.81%. Hong Kong exhibits a higher mean ROE at 10.19%, while Shenzhen's is lower at 7.43%. Various factors, including economic environment, market conditions, governance practices, regulations, industry composition, company size, capital structure, and management, contribute to these ROE variations.

The investigation also uncovers standard deviation differences in ROE values, with the GBA at 12.82%, Hong Kong at 8.74%, and Shenzhen at 15.76%. These variations relate to competition, market conditions, and stability. Hong Kong's lower standard deviation signifies its stable market, whereas Shenzhen's higher value reflects market dynamism. Industry composition and regulatory variations further affect standard deviation among regions. These findings stress the importance of considering multiple factors when analyzing ROE and standard deviation in listed companies across regions, acknowledging their influence on company performance.

4.1.2. Return on assets (ROA)

Table 2 presents mean ROA values for the 60 GBA-listed companies comprising 30 each from Hong Kong and Shenzhen. The GBA's mean ROA is 22.22%, with Hong Kong at 30.18% and Shenzhen at 14.25%. Hong Kong's listed companies exhibit more than double the ROA of Shenzhen's, highlighting substantial financial performance disparities. Further exploration of factors like industry composition, governance practices, regulations, and the economic environment is essential to understand these variations.

The study also assesses ROA standard deviation regionally among these listed companies. The GBA's standard deviation is 28.29%, Hong Kong's is 23.94%, and Shenzhen's is higher at 47.29%. These differences may result from economic conditions, market dynamics, and industry composition. Shenzhen's market volatility contributes to greater financial variability. Regional regulatory and governance frameworks likely affect stability and consistency in financial outcomes.

The results of the mean ROA values and the ROA standard deviations provide valuable insights into GBA-listed companies' financial

performance, underscoring the need for further research on factors influencing financial outcomes, including regulatory and governance practices.

4.1.3. Tobin's Q

Table 2 displays the average Tobin's Q values for the GBA-listed companies, which incorporates both the Hong Kong- and Shenzhen-listed companies. The GBA's average Tobin's Q is 64.11%. Hong Kong-listed companies show an average Tobin's Q of 59.95%, indicating undervaluation, while Shenzhen-listed companies average 68.27%, suggesting higher asset value than stock value. Hong Kong-listed companies exhibit more Tobin's Q variation, while Shenzhen-listed companies are closer to their average. The GBA has a 23.69% standard deviation, Hong Kong 27.02%, and Shenzhen 18.30%, reflecting differences in market valuation, asset replacement cost, and market conditions.

These Tobin's Q variations may result from industry composition, market conditions, and corporate governance practices. The results imply higher asset replacement costs for Hong Kong-listed companies, possibly due to economic and regulatory differences. Consequently, Hong Kong-listed companies' shares may be relatively cheaper in terms of Tobin's Q compared to Shenzhen-listed companies.

The findings of Tobin's Q calculations reveal significant market valuation differences among GBA-, Hong Kong-, and Shenzhen-listed companies. Further research could investigate underlying factors, including industry composition, market conditions, and corporate governance practices.

4.2. Independent variable

4.2.1. The first dimension of corporate governance (CG1)

Table 2 analyzes CG1, examining the largest shareholder's ownership structure as a corporate governance dimension. The results reveal that 67% of GBA-listed companies have individual shareholders holding over 20% of shares. This aligns with East Asian and Saudi Arabian studies, emphasizing the substantial influence of specific individual shareholders on strategic decisions, underlining the importance of understanding ownership dynamics in evaluating GBA corporate governance.

Comparing CG1 results between Hong Kong and Shenzhen, 63% of Hong Kong-listed companies have individual shareholders with over 20% of outstanding shares, while Shenzhen has 70%. On average, GBA-listed companies have 33% of shareholders holding less than 20% of shares (37% for Hong Kong, and 30% for Shenzhen). Over 65% of GBA-listed firms are controlled by major shareholders, often with family members as chairman or CEO, indicating significant family influence.

The standard deviation of CG1 is 47.14% for the GBA (48.19% for Hong Kong, and 45.83% for Shenzhen). A higher standard deviation for Hong Kong suggests better CG1 compared to Shenzhen when Hong Kong's mean CG1 is higher.

4.2.2. The second dimension of corporate governance (CG2)

In CG2, Table 2 indicates that the average percentage of the three largest shareholders holding less than 50% of shares is 78% in the GBA, 67% in Hong Kong, and 90% in Shenzhen. This points to a preference for multiple shareholders in the GBA, highlighting Shenzhen's stronger supervisory capacity compared to Hong Kong.

The standard deviation for CG2 is 41.20% in the GBA, 47.14% in Hong Kong, and 30% in Shenzhen. Hong Kong-listed companies exhibit significant variation from their mean CG2 values, while Shenzhen-listed companies outperform Hong Kong-listed companies in CG2 with a higher mean value.

4.2.3. The third dimension of corporate governance (CG3)

Table 2 presents findings on CG3 concerning board size. In the GBA, 47% of listed companies have board sizes ranging from 7 to 13 members, while in Hong Kong, this percentage is 60%, and in Shenzhen, it is 34%. This suggests that Hong Kong-listed companies exhibit better governance practices compared to Shenzhen-listed companies, as this board size range is conducive to efficient strategic decision-making and resource utilization.

The standard deviation for CG3 is similar across the GBA, Hong Kong, and Shenzhen, all falling somewhere between 47% and 50%, indicating no significant difference in the mean deviation of board sizes between the two regions. Comparing these results with research in Saudi Arabia (Buallay et al., 2017), where only 28.1% of listed companies had board sizes within this range, it becomes evident that the GBA demonstrates superior CG3 performance regarding appropriate board sizes and effective decision-making and resource-utilization.

4.2.4. The fourth dimension of corporate governance (CG4)

Table 2 shows findings on CG4 regarding board independence. In the GBA, Hong Kong, and Shenzhen, all listed companies have an average proportion of less than 50% independent external directors, indicating that boards in the GBA are not controlled by independent outside directors. However, having a majority of independent directors is important for an effective board. It is suggested that a board controlled by more than 50% independent external directors is more conducive to a company's development.

4.2.5. The fifth dimension of corporate governance (CG5)

Table 2 presents findings on CG5 regarding the separation of CEO and chairman roles. In the GBA, 70% of listed companies separate these roles, with Hong Kong at 73% and Shenzhen at 67%. This indicates higher adherence in Hong Kong. Separating these roles is essential to mitigate conflicts of interest and enhance corporate governance (Bouaziz, 2014; Khiari, 2013).

The standard deviation for CG5 is 45.83% for the GBA, 44.22% for Hong Kong, and 47.14% for Shenzhen, showing significant variation among

Shenzhen-listed companies. Hong Kong-listed companies exhibit higher CG5 compliance compared to Shenzhen, as seen in the higher mean compliance rate in Hong Kong.

4.3. Control variables

4.3.1. Total assets

The results reveal significant differences in *total assets* among listed companies in the GBA, Hong Kong, and Shenzhen. GBA-listed companies have a mean *total assets* of RMB29,359,170 million, while Hong Kong-listed companies have a mean of RMB5.362794 trillion, and Shenzhen-listed companies have a mean of RMB5,090,400 million. Hong Kong-listed companies have substantially higher total assets compared to both the GBA and Shenzhen.

However, total assets alone may not reflect a company's quality or performance. Some companies may choose Hong Kong's stock exchange for international exposure. Therefore, assessing performance should consider factors beyond total assets.

4.3.2. Age

Listed companies in the GBA have an average age of 30 years while Hong Kong-listed companies have an average age of 32 years and Shenzhen-listed companies have an average age of 27 years. These well-established companies offer attractive investment opportunities with reduced risk due to their long-standing stability, viability, profitability, and potential for continued operation.

4.3.3. Big Four

In Hong Kong, all listed companies in this study use one of the Big Four accounting firms for financial audits, while only 43% of the sampled Shenzhen-listed companies do the same. This difference highlights the Hong Kong Securities and Futures Commission's trust in the Big Four. In mainland China, local audit firms can comply with regulations, showing contrast in reliance on the Big Four.

Engaging a Big Four firm enhances financial statement credibility and reliability due to its global recognition and high-quality auditing. However, concerns about market dominance and its impact on fees and audit quality should prompt regulators to balance improved reporting quality with audit market competition.

4.3.4. Board size

The analysis reveals that GBA-listed companies, combining Hong Kong and Shenzhen markets, have an average board size of 14 members. Specifically, Hong Kong-listed companies exhibit a higher average board size of 18 members, while Shenzhen-listed companies maintain a smaller average board size of 10 members.

A larger board is generally seen as beneficial, promoting diversity in skills and knowledge and thereby enhancing decision-making and overall company performance (Daily et al., 2003). However, excessive board size can lead to inefficiencies and decision-making challenges (Dalton et al., 1998). Striking a balance between diversity and efficient decision-making is crucial.

Notably, Hong Kong-listed companies tend to have larger boards, potentially hindering optimal board performance. Achieving an optimal board size is vital for effectively utilizing diverse expertise while ensuring efficient decision-making processes.

5. DISCUSSION

5.1. Measurement of corporate governance, size, and performance

Table 3 presents a path analysis examining the link between corporate governance and firm performance factors, specifically ROE, ROA, and Tobin's Q. The companies, all situated within the GBA with 30 from Hong Kong and 30 from Shenzhen, are divided into high and low corporate governance groups using the total values of CG1 to CG5 where the companies that score three or more are considered high while those that score less than three are considered low.

T-statistics and z-statistics assess mean performance differences between these groups. Results reveal insignificance in mean financial performance (ROE) but significant variances in operational performance (ROA) and market performance (Tobin's Q), consistent with previous studies (Buallay et al., 2017; Hamdan et al., 2013).

The study also explores the impact of firm size as determined by total assets. Firms exceeding the median total assets value in their respective stock exchanges are considered "big firms". Hong Kong and Shenzhen have specific asset thresholds for this classification, enabling a regional analysis of differently-sized companies.

5.2. Descriptive statistics of corporate governance levels

5.2.1. ROE in corporate governance levels

The link between corporate governance and financial performance based on ROE is investigated by exploring the differences between the GBA companies with high corporate governance levels compared to those with low levels (see Table 3). High corporate governance GBA companies exhibit a mean ROE of 9.90%, lower than Hong Kong-listed (11.32%) but higher than Shenzhen-listed (8.17%). Low corporate governance GBA companies have

a mean ROE of 8.26%, lower than Hong Kong-listed (9.53%) and higher than Shenzhen-listed (7.11%). T-statistic values for GBA, Hong Kong, and Shenzhen firms are 0.0164, 0.0179, and 0.0106, respectively. Z-statistic values are 0.13, 1.17, and 0.07, respectively, indicating a greater difference in mean ROE between high and low corporate governance levels for Hong Kong-listed firms.

These findings establish a strong correlation between corporate governance and financial performance, contradicting hypothesis *H2*, which suggests no significant correlation. Multiple factors including the economic environment, market conditions, governance practices, regulations, industry composition, size, capital structure, and management contribute to performance variations. Recognizing these factors provides a more comprehensive understanding of the relationship. Effective corporate governance practices are pivotal in driving positive financial outcomes and informing strategies for improved company performance.

5.2.2. ROA in corporate governance levels

This study assesses the influence of corporate governance on the financial and operational performance of GBA-listed companies in Hong Kong and Shenzhen. It finds that firms with robust corporate governance practices exhibit superior financial and operational performance compared to those with weaker governance.

Initially, the analysis focused solely on ROA as a measure of operational performance but expanded to include ROE, providing a holistic view of corporate governance's impact.

Results show that high corporate governance firms in both cities have higher mean ROE and ROA values than low corporate governance firms, indicating efficient asset utilization and improved management under strong governance. Analysis based on t- and z-statistics reveals a more significant ROA difference for Shenzhen-listed firms compared to Hong Kong-listed firms, but no significant link between corporate governance and operational performance, aligning with hypothesis *H1*.

This comprehensive study underscores the importance of robust corporate governance in overall company performance and highlights the need to consider various factors when evaluating its relationship with financial outcomes.

Table 3. Advanced descriptive analysis

Performance	Corporate governance level											
	With: Mean value						Difference tests					
	High CG (CG ≥ 3)			Low CG (CG < 3)			t-statistic			z-statistic		
	HK	SZ	GBA	HK	SZ	GBA	HK	SZ	GBA	HK	SZ	GBA
ROE	11.32%	8.17%	9.90%	9.53%	7.11%	8.26%	0.0179	0.0106	0.0164	1.17	0.07	0.13
ROA	33.48%	34.54%	33.96%	27.84%	5.55%	16.14%	0.0564	0.2899	0.1782	1.01	0.14	0.63
Tobin's Q	58.30%	77.34%	67.21%	56.77%	64.38%	60.76%	0.0153	0.1296	0.0645	0.93	0.71	0.27
Performance	Firm size											
	With: Mean value						Difference tests					
	Big firm			Small firm			t-statistic			z-statistic		
	HK	SZ	GBA	HK	SZ	GBA	HK	SZ	GBA	HK	SZ	GBA
ROE	13.07%	6.13%	11.02%	6.67%	8.72%	6.59%	0.064	-0.0259	0.0443	1.40	-0.16	0.18
ROA	25.27%	13.27%	24.26%	34.54%	15.23%	19.89%	-0.0927	-0.0196	0.0437	-0.69	-0.19	0.15
Tobin's Q	76.42%	77.94%	71.65%	38.70%	58.60%	54.18%	0.3772	0.1934	0.1747	1.73	1.06	0.74

Note: Corporate governance level is dependent on the total value of CG, High CG is the total value of CG1-CG5 ≥ 3, and Low CG is < 3. The t-statistic is based on the parametric test two-independent sample t-test, used to test whether the unknown population means of two groups are equal or not, and the z-statistic is based on the non-parametric test Kolmogorov-Smirnov Z used to compare a sample with a reference probability distribution, as used like the standard normal distribution. The closer the t-value is to 0, the less difference there is between the two groups, and the farther the t-value is from 0, the greater the difference between the two groups. Firm size is dependent on the assets of the company. HK big firm has ≥ RMB7,746,340, SZ big firm has ≥ RMB2,327,610, and GBA big firm has ≥ RMB3,442,510.

5.2.3. Tobin's Q in corporate governance levels

This study evaluates the mean Tobin's Q values of GBA-listed companies in Hong Kong and Shenzhen, contrasting high and low corporate governance levels, as per hypothesis *H3*, which suggests no substantial correlation between corporate governance and market performance.

Surprisingly, results reveal the highest mean Tobin's Q in GBA companies under high corporate governance (67.21%). Conversely, Hong Kong-listed firms display a mean Tobin's Q of 58.30%, while Shenzhen-listed firms outperform both with a mean of 77.34% under high governance. When corporate governance is low, the mean Tobin's Q decreases for the GBA (60.76%), Hong Kong (56.77%), and Shenzhen (64.38%) alike.

These outcomes indicate that Hong Kong-listed firms generally have undervalued stocks compared to their Shenzhen counterparts, regardless of governance level. While t-statistics and z-statistics show significant Tobin's Q differences between governance levels for Shenzhen firms, the distinctions are less pronounced in Hong Kong.

To reconcile these findings with hypothesis *H3*, it is essential to consider factors affecting market performance, like industry dynamics, market conditions, and investor sentiment. The intricate relationship between corporate governance and market performance requires a holistic analysis. Considering these nuances, hypothesis *H3*, suggesting no significant correlation between corporate governance and market performance, stands when evaluating the results comprehensively. This study underscores the necessity of a thorough examination of various factors influencing market performance beyond corporate governance alone.

5.2.4. ROE in firm size

The results reveal significant financial performance differences between Hong Kong- and Shenzhen-listed companies contingent upon firm size. Big firms in Hong Kong exhibit a superior ROE of 13.07%, whereas Shenzhen's big firms report a lower ROE of 6.13%. Conversely, in the small firm category, Shenzhen-listed companies outshine Hong Kong counterparts with an 8.72% ROE value versus 6.67%. Intriguingly, Shenzhen-listed companies perform better financially within the small firm category compared to the big firm category, highlighting the role of firm size in shaping Shenzhen's financial performance. These findings underscore the need to account for firm size and location when evaluating financial performance. The differing performance of Hong Kong- and Shenzhen-listed firms across firm size categories emphasizes region-specific market dynamics and economic influences.

The study's t-statistics and z-statistics reveal that small-sized Shenzhen-listed firms outperform their larger counterparts financially. Moreover, a significant link between firm size and operational performance emerges, where larger firms exhibit higher ROE than smaller ones. These insights shed light on the factors influencing financial performance in the GBA, Hong Kong, and Shenzhen, emphasizing the importance of considering location and firm size in tailoring strategies to enhance financial performance.

5.2.5. ROA in firm size

The study assesses the financial performance of GBA-, Hong Kong-, and Shenzhen-listed companies through ROA and ROE ratios, offering insights into profitability concerning asset use and equity. Hong Kong's big and small firms exhibit superior asset utilization efficiency, leading to higher profitability and stronger financial performance than their Shenzhen counterparts. The analysis focuses exclusively on big and small firms, omitting other size categories.

Hong Kong-listed firms outshine Shenzhen counterparts in asset utilization and profitability. Among small firms, the GBA's mean ROA is 19.89%, while Hong Kong achieves 34.54%, and Shenzhen lags at 15.23%, signifying Hong Kong's superior asset management and profitability for small firms. Furthermore, small Hong Kong- and Shenzhen-listed companies outperform their larger counterparts in ROA, suggesting a minimal correlation between firm size and financial performance. In summary, the study underscores the significance of efficient asset utilization, especially for small companies, advocating for a focus on optimizing asset use to enhance overall firm performance.

5.2.6. Tobin's Q in firm size

This study explores the connection between firm size and market performance in the GBA, Hong Kong, and Shenzhen by using Tobin's Q as a metric. Results reveal no significant link between firm size and market performance. In the GBA, small firms have a mean Tobin's Q of 54.18% (38.70% in Hong Kong, 58.60% in Shenzhen), while big firms score 71.65% (76.42% in Hong Kong, 77.94% in Shenzhen). These findings imply that firm size does not reliably predict market performance in these regions, carrying implications for investors, policymakers, and managers.

6. CONCLUSION

This study offers a comprehensive assessment of corporate governance compliance and its effects on firm performance within listed companies in the GBA of China. The research examines five years of data from 60 publicly traded firms on the Hong Kong and Shenzhen stock exchanges.

Corporate governance adherence is rigorously evaluated based on five key principles, with various financial, operational, and market metrics used for a comprehensive assessment of business outcomes. The results yield significant insights, with an average 58% compliance rate highlighting opportunities for strengthening governance. Notably, Hong Kong firms display stronger adherence and superior financial returns compared to their Shenzhen counterparts.

A positive correlation is observed between compliance and operational efficiency, suggesting that higher governance standards are linked to increased productivity (Alzubi & Bani-Hani, 2021). The study, however, does not find explicit associations with financial or market outcomes. This lack of connection between operational factors and

market performance necessitates further exploration, considering possible company-specific and regional influences.

Nonetheless, the study underscores the advantages of improved governance in nurturing essential capabilities for sustainable value creation. These insights can be used by regulators to formulate targeted reforms promoting transparency and shareholder interests (Konstantinidis et al., 2022).

While this study provides valuable foundational knowledge, limitations like sample size constrain the generalizability of conclusions across the entire

GBA business landscape. Future research, encompassing additional exchanges and larger, longer-term samples, promises more robust insights.

In summary, this study underscores the importance of variances in compliance that influences strategic priorities across the GBA. It emphasizes the need for ongoing in-depth analysis involving diverse firms and extended timeframes to optimize governance frameworks and economic outcomes in this vital region (Marashdeh, Alomari, Aleqab, et al., 2021).

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