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The Impacts of Corporate Governance Mechanisms and Ownership Structure on Firm Performance: A Case Study of Chinese Dual-Listed Companies

Wing Kwong, Chan*

Graduate school of business, Universiti Sains Malaysia,

Penang, Malaysia

nic14998114@hotmail.com

Ei Yet, Chu

Graduate school of business, Universiti Sains Malaysia,

Penang, Malaysia

eychu@usm.my

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Abstract

Purpose: This study examines the impactful effects of both corporate governance mechanisms and ownership structure on the firm performance of Chinese dual-listed companies which form a specific class of cross-listed companies having core business in China and list their shares in both the China A-share market and the Hong Kong market simultaneously.

Design/Methodology/Approach: Huber White's Robust method in the LS technique is employed in this study to examine the impacts of corporate governance mechanisms and ownership structure on firm performance of Chinese dual-listed companies. To do so, we select 100 Chinese dual-listed companies consisting of 941 firm-year observations from 2003 to 2019 in our study, use both *ROA* and *ROE* to proxy the firm performance, and introduce a state control firm attribute, a binary variable representing ownership rights plus manipulation rights of China government, in the regression model to compare its effects on firm performance with that of state ownership.

Findings: In our paper, we find that the independent variable having significant associations with both *ROA* and *ROE* in the same sign significantly influences the firm performance of Chinese dual-listed companies. The regression results show that both the independent director ratio and board size worsen the firm performance in terms of both *ROE* and *ROA*, respectively, but they do not contribute to the mitigation of agency costs or the improvement of firm performance. However, we do not observe any legal bonding effects on the firm performance in this study. On the other hand, we find that contrary to the consensus of CEO duality's negative effects on firm performance in literature, CEO duality positively influences the firm performance in terms of both *ROA* and *ROE*. Besides, foreign ownership is found to be positively related to firm performance in terms of *ROA* only, while state ownership is found to insignificantly and negatively influences firm performance. However, the state control firm attribute, representing the ownership rights and manipulation rights of China government, positively influences the firm performance in terms of both *ROA* and *ROE*. Thus, we conclude that the CEO duality and the state control firm attribute are the two determinant factors that positively influence Chinese dual-listed companies' firm performance. China's domestic private ownership significantly and positively associates with *ROE*, while the firm size exhibits a significant and positive influence on the firm performance in terms of both *ROA* and *ROE*. In contrast, the influence of the leverage ratio on firm performance is negative and is opposite to that of firm size, the financial firm attribute negatively relates to *ROA*, and no significant influence on firm performance is found in stock return volatility.

Originality/Value: The research results complement the prior papers related to the fields of cross-listing and firm performance in literature. The findings in our paper are useful for investors to evaluate the firm performance of Chinese dual-listed companies, and for policymakers to enhance the listing rules and laws to ensure Chinese companies' independent directors and other board members act diligently to improve the firm performance.

Keywords: cross-listing, firm performance, corporate governance, ownership structure, legal bonding, agency costs, board structure.

JEL Classification Codes: F23, F30, F65, G11, G15, G32

1. Introduction

Similar to other emerging markets, the tight currency control policies and the lack of foreign capital in China are the financial barriers to Chinese companies seeking local and overseas expansions. Cross-listing to overseas developed markets, including the US market, London market, and Hong Kong market, is one of the resolutions to overcome the market segmentation problem to raise international capital (Karolyi, 2006; Stulz, 1999). This study aims to examine the impactful effects of corporate governance mechanisms and ownership structure on Chinese dual-listed companies' firm performance proxied by *ROA* and *ROE*. In this study, Chinese dual-listed companies are defined as Chinese companies that have core business in China but list their shares in the China A-share market, a segmented emerging market, and the Hong Kong market, a world-class well-developed market, simultaneously. Therefore, Chinese dual-listed companies form a specific class of cross-listed companies (Karolyi, 2006).

Besides, the legal bonding theory (Ferris, Kim, & Noronha, 2009; Dodd, 2013; Ghadhab & M'rad, 2018) and agency theory (Claessens & Fan, 2002; Jensen & Meckling, 1976; Kalsie & Shrivastav, 2016) are the base stones that support the arguments of prior studies related to the field of cross-listing in literature. Cross-listed companies from emerging markets are legally bonded by the host markets' more stringent listing rules and laws. As indicated by Ayyagari & Doidge (2010), Karolyi (2006), Darsono, et al. (2022), and Stulz (1999), foreign investors in host markets monitor the manipulation of the highly concentrated cross-listed companies and improve the quality of corporate governance. The consequence of cross-listing to well-developed markets is the mitigation of agency costs and the improvement in firm performance (Busaba et al., 2015; Karolyi, 2006). However, the legal bond theory and the agency theory are developed based on data from the US market or other well-developed markets that the companies with dispersed ownership structures dominate. The legal bonding theory and the agency theory may fail to fully capture the specificities of companies that come from emerging markets and have highly concentrated ownership structures (Hegde et al., 2020; Claessens & Fan, 2002; Zhang et al., 2018). In addition, different host markets have different market contexts and different stringency of listing rules and laws. Therefore, the influence of corporate governance mechanisms and ownership structure on firm performance may vary remarkably from market to market (Suu, Tien, & Wong, 2021). Many issues related to a dedicated class of cross-listed companies from emerging countries are still unexplored. This study's motivation is to better understand how the corporate governance mechanisms and ownership structure affect the firm performance of Chinese dual-listed companies.

The *ROA*, return on assets, and *ROE*, the return on equity, are the two accounting measures (Sethi, Sahu, & Maity, 2022; Abdallah & Bahloul, 2021) widely used in literature to proxy the firm performance of a company (Aloui & Jarboui, 2018; Abdallah & Ioannidis, 2010; Al-ahdal, Alsamhi, Tabash, & Farhan, 2020; Vu, Phan, & Le, 2018, Mahmood, et al. 2022). The liabilities

of the company are taken into account in calculating the *ROA*. In comparison, the calculation of *ROE* disregards the effects of the company's liabilities. Furthermore, the independent director ratio, board size, and CEO duality are three corporate governance mechanisms employed in this study. The variables representing the ownership structure are foreign ownership, state ownership, and China's domestic private ownership. In addition, a binary variable of the state control firm attribute is introduced to the regression model to compare its effects on firm performance with that of state ownership. The binary variable of the state control firm attribute is equal to 1 if the company's controlling shareholder is the China government (Lin et al., 2020) or 0 otherwise. State ownership represents ownership rights but may not represent manipulation rights. For instance, China government would invest and own plenty of shares of a private company that is, however, manipulated by the company founders, not the China government or its representatives. In contrast, the state control firm attribute represents ownership rights plus manipulation rights. In Chinese state-controlled companies, the China government is the controlling shareholder (also the largest shareholder) and appoints political officers and professional executives to form the board to run the companies on behalf of the China government. All Chinese state-controlled companies are mandated to listen to the political officers (representatives of the Communist Party of China) before making strategic decisions (Lin et al., 2020; Ma & He, 2018). More information is obtainable from the official website of the State-owned Assets Supervision and Administration Commission of the State Council, <http://en.sasac.gov.cn>. Thus, state ownership and state control firm attribute are two different concepts. Their influences on firm performance may be different.

Through this research, we expect to fill three missing gaps in extant literature related to Chinese dual-listed companies. First, this research aims to find out how the corporate governance mechanisms influence the firm performance of Chinese dual-listed companies and the effectiveness of the legal bonding effect on boards of Chinese dual-listed companies. Second, this research examines how foreign ownership and state ownership relate to the firm performance of Chinese dual-listed companies. Third, this research introduces a binary variable of the state control firm attribute to proxy the political connection to China government. The influence of state control firm attribute on firm performance is assessed and compared to that of state ownership.

The research results complement the prior papers related to the fields of cross-listing and firm performance in literature. Investors and policymakers can use the research results as reference information to evaluate the firm performance and layout plans to improve the corporate governance of Chinese dual-listed companies.

2. Literature Review

Cross-listing to overseas developed markets is one of the resolutions for companies from emerging markets to overcome the market segmentation problems to raise international capital for future local and overseas expansions (Stulz, 1999; Karolyi, 2006). The cross-listed companies have to comply with the more stringent listing rules and laws of the host markets and adopt the higher standard of corporate governance practices of the host markets. The cross-listed companies are said to be legally bonded in the host market. The consequence of cross-listing is the improvement in corporate governance and the mitigation of agency costs incurred by the management entrenchment and the expropriation of minority shareholders (Coffee Jr., 2002; Ferris et al., 2009).

You, Payne, & Lin, (2018) examine the impacts of cross-listing to developed markets on firm performance and evidence that firms cross-listed to developed markets, especially the English markets, have a higher firm value due to legal bonding effects. Chakraborty, Gao, & Sheikh (2019) study the Canadian companies that cross-list to the US market. The authors find that the adaptation of US corporate governance practices legally bonds the cross-listed Canadian companies. The findings of Sayari & Marcum, (2018), who study the bonding effects of cross-listed companies from emerging countries in the US market, are consistent with the results obtained by You et al. (2018) and Chakraborty et al. (2019). However, Jian, Tingting, & Shengchao (2011), Liu, Jiang, & Sathye (2017), and Li (2019) disagree with the bonding effects on firm performance in their studies related to Chinese cross-listed companies.

The positive influence of independent directors and board members on firm performance are two widely used measures to justify the effectiveness of the legal bonding effects in the literature. For instance, Aloui & Jarboui, (2018) and Hatane, Supangat, Tarigan, & Jie, (2019), who study the impact of corporate governance mechanisms on firm risk, and documented that the independent director ratio can effectively mitigate the agency costs and firm risk. It is because independent directors are agency costs mitigators who can monitor managers and controlling shareholders.

On the other hand, Boateng, Cai, Borgia, Bi, & Ngwu (2017) and Wang, Anderson, & Chi (2017) discover that the cases in China are different. They argue that the appointed independent directors in Chinese companies are not truly independent and fail to improve the companies' corporate governance and agency problems. Fariha, Hossain, & Ghosh (2022) study the effects of board characteristics on the firm performance of thirty banks listed in the Dhaka Stock Exchange and report that independent directors exhibit a negative and significant influence on firm performance. Similarly, a negative and significant relationship between the independent director ratio and firm performance is discovered by Queiri, Madbouly, Reyad, & Dwaikat (2021) who assess the impacts of corporate governance mechanisms on the firm performance of fourteen non-financial companies listed in the Muscat Securities Market (MSM30). Thus, prior research results regarding the relationship between board independence and firm

performance are mixed.

While the mitigating effect of the separation of CEO and chairman duties on agency costs is widely supported by prior research papers and has become the consensus in the literature (Chakraborty et al., 2019; Mathew, Ibrahim, & Archbold, 2016). However, an exceptional case is reported by Pham & Pham (2020) who indicate the positive impact of CEO duality on firm performance in the growth stage of Vietnamese companies due to unity of command. Furthermore, Lok, Chuah, & Hooy (2022) study the Malaysian firms' performance and show that under the adaptation of Data-Driven Leadership, CEO duality has negative impact on manufacturing firms, but has positive impact on non-manufacturing firms.

In addition, companies from emerging markets usually have highly concentrated ownership structures. The expropriation of minority shareholders by the controlling shareholders, the principal-to-principal conflict, is prevalent in highly concentrated companies (Claessens & Fan, 2002; Estwick, 2016; Nguyen, et al., 2020, 2021; Nguyen & Wong, 2021). Daraghma (2016) examines the impact of ownership structure on the firm performance of companies listed in the Palestine Exchange and finds that companies with highly concentrated state ownership worsen the firm performance. Daraghma (2016) finds that foreign investors in Palestine exchange monitor the companies and improve firm performance. In addition, Sabbaghi (2016) asserts that Chinese companies with a high concentration of state ownership are poor in corporate governance and firm performance. Liljebloom, Maury, & Hörhammer (2020) examine how various control forms of state ownership (such as major or minor, direct or indirect shareholders) are related to the firm performance of 72 Russian companies listed in the MOEX board market index. Authors report a significant and negative relationship between major state control forms of state ownership (over 50%) and firm performance proxied by firm valuation.

However, Yu (2013) and Chang & Wong (2004) have different points of view regarding the relationship between state ownership and firm performance. They argue that Chinese companies with highly concentrated state ownership have a stronger political connection to China government and are easier to receive support from China government, such as financial support during an adverse market environment or the monopolization of scarce national resources. Thus, the state ownership of Chinese companies can guarantee firm performance. Moreover, controlling shareholders of concentrated companies will have sufficient incentive to improve the internal control and corporate governance of the companies that, in return, reduce agency costs. In addition, other factors that may affect the firm performance are volatility and corporate market leverage as indicated by Vuong Nguyen, & Wong, (2022).

Therefore, prior research results related to the impacts of corporate governance mechanisms and ownership structure on firm performance are mixed in literature due to the difference in market contexts and the specificities of companies. In this study, we examine the impactful effects of corporate governance mechanisms and ownership structure on the firm performance of Chinese dual-listed companies. The results of this study are expected to

complement prior research papers related to the field of cross-listed companies' firm performance in literature.

3. Hypotheses

ROA and *ROE* are the two widely used accounting measures to proxy firm performance in literature (Fariha et al., 2022; Shahid, Abbas, Latif, Attique, & Khalid, 2020; Liljeblom et al., 2020; Queiri et al., 2021). In this study, the firm performance is proxied by *ROA* and *ROE*. Any independent variable is regarded to have a significant influence on firm performance if it has significant associations with both *ROA* and *ROE* in the same sign at a significance level not higher than the 5% threshold value.

Prior research papers show that the appointed independent directors are agency cost mitigators who can improve transparency, corporate governance quality, and firm performance (Aloui & Jarboui, 2018; Hatane et al., 2019; Sethi et al., 2022). On the other hand, Boateng et al. (2017) and Wang et al. (2017) have the opposite view. They assert that the appointed independent directors of Chinese companies listed in the China A-share market are not truly independent and fail to improve the agency problem. Thus, the impact of independent directors on agency costs and firm performance has no consensus in the literature. However, Chinese dual-listed companies are special as their shares are listed simultaneously in the China A-share market and the Hong Kong market. The market context of the Hong Kong market is different from China market. The listing rules and laws of the Hong Kong market are more stringent than that of China market. However, the effect of independent directors on Chinese dual-listed companies' agency costs is still uncertain. To find out the answer, hypothesis *H1* is developed.

H1: The independent director ratio positively influences the firm performance of Chinese dual-listed companies.

CEO duality is a corporate governance practice in which an individual acts the dual roles of CEO and chairperson in a company. CEO duality represents the concentration of all power in one person and easily results in the expropriation of minority shareholders and other agency problems (Sayari & Marcum, 2018; Claessens & Fan, 2002; Moyer, Rao, & Baliga, 1996; Thakolwiroj & Sithipolvanichgul, 2021; Gul, Sajid, Razzaq, & Afzal, 2012). Thus, CEO duality is one of the widely used corporate governance mechanisms in literature to analyze the impacts of agency issues on firm performance (Gul et al., 2012; Sayari & Marcum, 2018; Moyer et al., 1996). We follow the logic of agency theory (Claessens & Fan, 2002; Gul et al., 2012; Jensen & Meckling, 1976) and develop the following hypothesis to examine the effect of CEO duality on the firm performance of Chinese dual-listed companies:

H2: The CEO duality negatively influences the firm performance of Chinese dual-listed companies.

The mitigation of agency costs and the improvement of firm performance incurred by the monitoring role of foreign investors are the consensus of prior research papers in the literature (Vo, 2015; Naufa, Lantara, & Lau, 2019; Aloui & Jarboui, 2018; Daraghma, 2016). It is because foreign investors are evidenced to monitor managers and reduce managerial entrenchment (Lins, 2003; Ghosh, Giambona, Harding, & Sirmans, 2011). In addition, under the monitoring of foreign investors, the companies controlling shareholders find it difficult to expropriate the minority shareholders (Al-zaidyeen & Al-rawash, 2015; Chang & Wong, 2004; Estwick, 2016) and divert companies' profits to themselves by the expense of companies' resources at higher costs (Busaba, Guo, Sun, & Yu, 2015; Wang et al., 2017). Therefore, the following null hypothesis is developed to examine the monitoring effect of foreign investors on the firm performance of Chinese dual-listed companies.

H3: Foreign ownership positively influences the firm performance of Chinese dual-listed companies.

The high concentration of state ownership is one of the firm characteristics of Chinese dual-listed companies. Prior research papers show that a high concentration of state ownership is associated with poor corporate governance and severe principal-to-principal conflict (Claessens, & Fan, 2002; Liljeblom et al., 2020; Queiri et al., 2021; Sabbaghi, 2016). However, some researchers assert that those Chinese companies with a high concentration of state ownership are benefited from government support, such as the supplies of scarce national resources and financial support (Yu, 2013; Chang & Wong, 2004). Therefore, the impact of state ownership on firm performance is still controversial. We hypothesize the negative association between state ownership and firm performance to examine the government intervention effect.

H4: State ownership negatively influences the firm performance of Chinese dual-listed companies.

We argue that state ownership and state control firm attribute are two different concepts. State ownership may fail to represent the manipulation rights, hence the political connection to China government. For instance, a Chinese private company with a high concentration of state ownership manipulated by the company founders is an outstanding example. In comparison, the state control firm attribute represents ownership rights and manipulation rights (Lin et al., 2020; Ma & He, 2018). Thus, the state control firm attribute is more appropriate to proxy the political connection to China government. By comparing the regression results between state

ownership and state control firm attribute, we can understand how the political connection to China government affects the firm performance of Chinese dual-listed companies. However, we have no idea of how the state control firm attribute influences the firm performance of Chinese dual-listed companies. We follow Claessens and Fan (2002), Liljeblom et al. (2020), Queiri et al. (2021), and Sabbaghi (2016) to develop the following hypothesis:

H5: State control firm attribute negatively influences the firm performance of Chinese dual-listed companies.

4. Methodology and Data

4.1. Methodology

The Return On Assets, *ROA*, and the Return On Equity, *ROE*, are the two widely used accounting measures (Abdallah & Bahloul, 2021; Queiri et al., 2021) to proxy the firm performance of a company in literature (Al-ahdal et al., 2020; Velte, 2017; Aloui & Jarboui, 2018; Kalsie & Shrivastav, 2016; Abdallah & Ioannidis, 2010). Therefore, we follow Abdallah & Bahloul (2021), Queiri et al. (2021), Liljeblom et al. (2020), Al-ahdal et al. (2020), and Yu (2013) to use *ROA* and *ROE* as the dependent variables in the regression models with their definitions as shown in the following equations:

$$ROA = \frac{Net\ Income}{Total\ Assets} , \quad (1)$$

$$ROE = \frac{Net\ Income}{Shareholder's\ Equity} = \frac{Net\ Income}{Total\ Assets - Total\ Liabilities} \quad (2)$$

The following regression model is used to assess the impacts of both corporate governance mechanisms and ownership structure on Chinese dual-listed companies' firm performance, *FP*, proxied by *ROA* or *ROE*.

$$FP = c + \beta_{ID} \cdot ID + \beta_{BS} \cdot BS + \beta_{CD} \cdot CD + \beta_{FO} \cdot FO + \beta_{SO} \cdot SO + \beta_{PO} \cdot PO + \beta_{SC} \cdot SC + \beta_{FS} \cdot FS + \beta_{LEV} \cdot LEV + \beta_{FIN} \cdot FIN + \beta_{VOL} \cdot VOL + \varepsilon , \quad (3)$$

where c is the constant value, ε is the error term, and FP is either ROA or ROE such that:

$$FP = \begin{cases} ROA \\ or \\ ROE \end{cases} .$$

Many corporate governance researchers, including Boateng et al. (2017), Sethi et al. (2022), Queiri et al. (2021), and Moyer et al. (1996) use independent director ratio, the board size, and CEO duality as the corporate governance mechanisms in their studies to measure the agency costs (Michael C. Jensen, 1986; Jensen & Meckling, 1976; Karolyi, 2006) and their effects on firm performance. Therefore, it makes sense to recruit the independent director ratio, board size, and CEO duality as the independent variables in this study. The independent director ratio, ID , is calculated as the number of independent directors divided by the number of board members. The board size, BS , equals the total number of board members. The CEO duality, CD , is a binary variable that is defaulted to be 1 if the CEO and chairman of the company cannot be verified to be two different persons or 0 otherwise. It is because CEO duality is prevalent in Chinese companies, especially in Chinese private companies. Furthermore, the separation of CEO and chairman roles into two different persons is not mandatory according to the company law of China.

Similar to other companies from emerging markets, ownership concentration (Boateng et al., 2017; Li, 2019; Sabbaghi, 2016) is one of the characteristics of Chinese dual-listed companies. Activities of foreign investors, China government, and China's domestic private investors interact to characterize the costs of conflicts, such as the principal-to-principal, or principal-to-agent conflicts (Estwick, 2016; Sabbaghi, 2016; Garanina & Kaikova, 2016; ElKelish, 2018), and hence, to measure the firm performance. Thus, this study uses foreign ownership, FO , state ownership, SO , and China's domestic private ownership, PO , to proxy the ownership structure of Chinese dual-listed companies. The classification of ownership type relies on the nationality of the investor. For instance, foreign investors' shares of Chinese companies are classified as foreign ownership. Shares that are owned by China government are counted as state ownership. In this research, China government collectively refers to either China's central government or China's provincial governments. All shares owned by Chinese citizens are counted as China's domestic private ownership. However, only shares held by the top 10 largest shareholders are entitled to the ownership calculation because only the top 10 largest shareholders' information is disclosed in companies' annual reports according to the company law of China.

The state control firm attribute, SC , is a binary variable that is equal to 1 if the company's controlling shareholder (the largest shareholder) is China government. In state-controlled Chinese companies (Lin et al., 2020), China government appoints political officers and professional executives to form the board to run the companies on behalf of China government. Apart from pursuing business growth, state-controlled companies are obligated to fulfill

government policies. Boards of state-controlled Chinese companies are mandated to listen to the political officers (The representatives of the Communist Party of China) before making any significant strategic decisions (Lin et al., 2020; Ma & He, 2018). Thus, the state control firm attribute represents both ownership rights and manipulation rights. State-controlled Chinese companies should have a stronger political connection to China government than non-state-controlled Chinese companies. Our argument is in line with the paper documented by Lin et al., (2020). The use of the state control firm attribute, *SC*, in the regression model should be more appropriate than state ownership to proxy the China government intervention in Chinese dual-listed companies.

The firm size, *FS*, the leverage ratio, *LEV*, the financial firm attribute, *FIN*, and the stock return volatility, *VOL*, are the four control variables used in the regression model. The firm size, *FS*, is the natural logarithm of the company's total assets. The leverage ratio, *LEV*, is calculated as the ratio of long-term liabilities over the company's total assets. *FIN* is a binary variable equal to 1 if the company is a financial company or 0 otherwise. The stock return volatility, *VOL*, is the standard deviation of the daily stock return rate of the company recorded in the China A-share market. Thus, Equation 3 specifies the regression model of this study:

Table 1 exhibits the summary of all variables entered into the regression model as shown in Equation 3.

Table 1. Summary of variables.

Variable	Description	Reference
Dependent Variable:		
<i>ROA</i>	Return on assets, a measure of profit earning efficiency.	Abdallah & Bahloul, (2021), Queiri et al., (2021), Liljeblom et al., (2020), Al-ahdal et al., (2020) and Yu, (2013)
<i>ROE</i>	Return on equity, a measure of equity utilization efficiency.	Abdallah & Bahloul, (2021), Liljeblom et al., (2020), Al-ahdal et al., (2020) and Yu, (2013)
Corporate Governance:		
<i>ID</i>	Independent director ratio.	Boateng et al., (2017), Sethi et al., (2022) and Queiri et al., (2021)
<i>BS</i>	Board size	Boateng et al., (2017), Sethi et al., (2022) and Queiri et al., (2021)
<i>CD</i>	CEO duality, a binary variable that is defaulted to 1 if CEO and chairman cannot be verified to be two different persons, or 0 otherwise.	Boateng et al., (2017), Queiri et al., (2021) Moyer et al., (1996) and Pham & Pham, (2020)
Ownership:		
<i>FO</i>	Foreign ownership in percentage.	Sabbaghi, (2016), ElKelish, (2018), Vo, (2015) and Naufa et al., (2019)
<i>SO</i>	State ownership in percentage.	Sabbaghi, (2016), Boateng et al., (2017), (Li, (2019), Yu, (2013) and Liljeblom et al., (2020)
<i>PO</i>	China's domestic private ownership in percentage.	Sabbaghi, (2016), ElKelish, (2018), Che, (2018), Kamarudin et al., (2020) and Bhabra et al., (2008)
<i>SC</i>	State control firm attribute, a binary variable that is equal to 1 if the company's controlling shareholder is China government, or 0 otherwise.	Lin et al., (2020), Ma & He, (2018) and Liljeblom et al., (2020)

Control Variable:

<i>FS</i>	Firm size, calculated as the natural logarithm of the company's total assets.	Huang & Wang, (2015) and Chiang, (2017)
<i>LEV</i>	Leverage ratio, calculated as the ratio of long-term liabilities over the total assets of the company.	Florackis & Ozkan, (2009), Garanina & Kaikova, (2016), Wen et al., (2002) and Amin et al., (2022)
<i>FIN</i>	Financial firm attribute, a binary variable that is equal to 1 if the company is a financial company, or 0 otherwise.	Amin et al., (2022), Borges Júnior, (2022) and Sethi et al., (2022)
<i>VOL</i>	Stock return volatility of the company, calculated as the standard deviation of the daily stock return rate recorded in China A-share stock prices.	Xie et al., (2019), Che, (2018) and Naufa et al., (2019)

4.2. Data

In this study, the Chinese dual-listed companies are the Chinese companies that have core business in China and list their shares in the China A-share market and the Hong Kong market simultaneously. There were only 114 Chinese dual-listed companies from 2003 to 2019. After discarding 14 companies with missing or incomplete data, 100 Chinese dual-listed companies are retained and selected in this study. Among these 100 selected Chinese dual-listed companies, 24 are financial companies. All raw data were collected manually from the official websites and annual reports of selected Chinese dual-listed companies available from the Shanghai Stock Exchange, www.sse.com.cn, and Shenzhen Stock Exchange, www.szse.com.cn. China A-share stock prices information, used to calculate the stock return volatility, is obtainable from Chinese financial intermediaries' online trading websites. The panel data consists of 941 firm-year observations in which 135 observations have CEO duality equal to 1 and 771 observations have the state control firm attribute equal to 1.

5. Empirical Results

4.3. Descriptive Statistics

Data shown in Table 2 is the descriptive statistics of all non-binary variables used in the regression model as shown in Equation 3. The mean and median of *ROA* are 0.0310 and 0.0240. *ROA*'s skewness is -0.9363, inside the range of [-1,1], and its distribution is highly normal. *ROE*'s mean and median are 0.0764 and 0.0920. Its skewness is -12.7822, outside the range of [-1,1]. The distribution of *ROE* is left-skewed and is moderately normal. The independent director, *ID*, has a mean and median of 0.3841 and 0.3636, respectively. Its skewness is 1.2259, outside the range of [-1,1]. Its distribution is left-skewed and moderately normal. The mean, median, and skewness of board size, *BS*, are 10.6741, 10.0000, and 0.8464. *BS*'s skewness is inside the range of [-1, 1]. The distribution of *BS* is highly normal. Among the foreign ownership, *FO*, state ownership, *SO*, and China's domestic private ownership, *PO*, *SO* has the highest mean and median, 41.1920 and 45.3262. *PO* has the smallest mean and median, 9.7340 and 4.2100. The mean and median of *FO* are in the middle, such as 25.8188 and 25.8250. However, *FO* has the smallest standard deviation, 10.3831, and *SO* has the highest standard deviation, 20.9407. The highest standard deviation of *SO* may be due to the shares reform scheme of China in which SOEs are reformed to become publicly listed companies and a high portion of initially state-owned shares become tradable and sold in the market. However, the skewness of *FO* and *SO* are 0.1110 and -0.5020, and both are inside the range of [-1, 1]. The distributions of *FO* and *SO* are highly normal. While the *PO* has a skewness of 2.2876, outside the range of [-1, 1]. Its distribution is right-skewed and moderately normal. For the control variables, firm size, *FS*, the leverage ratio, *LEV*, and the stock return volatility, *VOL*, the skewness of *FS* and *LEV* are 0.4511 and -0.1709 and are inside the range of [-1, 1]. The distributions of *FS* and *LEV* are highly normal. However, *VOL*'s skewness is 3.5245, outside the range of [-1, 1]. Its distribution is moderately normal.

4.4. Correlation Matrix

Table 3 is the correlation matrix of all non-binary variables used in this research. The correlation coefficient between *ROA* and *ROE* is 0.5811 and is outside the range of [-0.50, 0.50]. The correlation relationship between *ROA* and *ROE* is positive and moderately strong. The correlation coefficient between *SO* and *PO* is -0.7317 and is outside the range of [-0.50, 0.50]. *SO* and *PO* are moderately and negatively correlated. The collinearity effect may affect the regression coefficients of *SO* and *PO*. Since China's domestic private ownership is not small (mean value of 9.7340%) and is an integral part of the company's ownership structure, China's domestic private ownership is retained in the model's specification and is viewed as a condition in the statistical analysis of state ownership. Furthermore, the correlation coefficient between two control variables, *FS* and *LEV*, is 0.6292 and is outside the range of [-0.50, 0.50]. The correlation relationship between *FS* and *LEV* is positive and moderately strong. Since *FS* and *LEV* are control variables, their collinearity effect will not be tested. The rest of the correlation coefficients are inside the range of [-0.5, 0.5]. The corresponding correlation relationships and multicollinearity effect are weak.

Table 2. Descriptive statistics.

Variable	<i>ROA</i>	<i>ROE</i>	<i>ID</i>	<i>BS</i>	<i>FO</i>	<i>SO</i>	<i>PO</i>	<i>FS</i>	<i>LEV</i>	<i>VOL</i>
Mean	0.0310	0.0764	0.3841	10.6741	25.8188	41.1920	9.7340	25.0588	0.6009	2.6405
Median	0.0240	0.0920	0.3636	10.0000	25.8250	45.3262	4.2100	24.9128	0.5886	2.4100
Maximum	0.2823	0.6544	0.7143	22.0000	58.1200	83.1200	83.6500	31.0359	0.9740	16.4350
Minimum	-0.2969	-4.4997	0.1667	4.0000	0.0000	0.0000	0.0000	19.8115	-0.0537	0.0048
Std. Dev.	0.0494	0.2113	0.0678	2.9289	10.3831	20.9407	13.4790	2.3476	0.2176	1.2528
Skewness	-0.9363	-12.7822	1.2259	0.8464	0.1110	-0.5020	2.2876	0.4511	-0.1709	3.5245

Table 3. Correlation matrix.

	<i>ROA</i>	<i>ROE</i>	<i>ID</i>	<i>BS</i>	<i>FO</i>	<i>SO</i>	<i>PO</i>	<i>FS</i>	<i>LEV</i>	<i>VOL</i>
<i>ROA</i>	1.0000									
<i>ROE</i>	0.5811	1.0000								
<i>ID</i>	0.0222	-0.0202	1.0000							
<i>BS</i>	-0.0928	0.0971	-0.4184	1.0000						
<i>FO</i>	0.0649	-0.0173	-0.1260	0.0283	1.0000					
<i>SO</i>	0.0201	0.0261	0.0648	-0.0682	-0.2109	1.0000				
<i>PO</i>	0.0253	0.0070	0.0023	-0.0732	-0.0857	-0.7317	1.0000			
<i>FS</i>	-0.0615	0.1995	0.0630	0.4203	-0.2230	0.2403	-0.1063	1.0000		
<i>LEV</i>	-0.4007	-0.0302	-0.0332	0.3286	-0.0292	0.0647	-0.0603	0.6292	1.0000	
<i>VOL</i>	-0.0107	-0.0681	-0.0417	-0.0976	0.0549	-0.0692	0.0855	-0.2539	-0.1309	1.0000

4.5. Regression Results

Data shown in Table 4 are the two random effects model regression results of *ROA* and *ROE*, the proxies of firm performance, against all the independent variables. According to the Hausman test results (not shown in this paper), random effects models are more appropriate in both regressions of *ROA* and *ROE*. In addition, Huber White's Robust method in the LS technique is employed in the regressions to address the heteroscedasticity problem. Both regression models of *ROA* and *ROE* are statistically significant as their respective p-values of F-statistic are less than 0.01, such as at a 1% significance level (not shown in this paper). The threshold value to determine the significance of the association between a dependent variable and an independent variable is a 5% significance level. An independent variable is regarded to significantly influence the firm performance of Chinese dual-listed companies only if the independent variable has significant associations with *ROA* and *ROE* in the same sign. The regression results in Table 4 are divided into two columns, the *ROA* column, and the *ROE* column.

Considering the regression results of the *ROA* column shown in Table 4, the independent director ratio, *ID*, has an insignificant negative association with *ROA*. While the board size, *BS*, has a significant and negative association with *ROA* at a 5% significance level. However, the CEO duality, *CD*, has a significant positive association with *ROA* at a 5% significance level. Among the foreign ownership, *FO*, state ownership, *SO*, and China's domestic private ownership, *PO*. Both *FO* and *PO* have significant positive associations with *ROA* at a 1% significance level. While *SO* has a negative but insignificant association with *ROA*. However, the state control firm attribute, *SC*, has a significant positive association with *ROA* at a 1% significance level. Among the four control variables, the firm size, *FS*, is positively associated with *ROA* at a 1% significance level. Both leverage ratio, *LEV*, and financial firm attribute, *FIN*, have significant negative associations with *ROA* at 1% and 5% significance levels, respectively. However, the stock return volatility, *VOL*, is found to have an insignificant negative association with *ROA*.

The regression results of *ROE* are quite different from that of *ROA*. The independent director ratio, *ID*, has a significant and negative association with *ROE* at a 5% significance level. Since the independent director ratio is negatively related to both *ROE* and *ROA* (the association with *ROA* is insignificant), hypothesis *H1* is rejected. While the board size, *BS*, has an insignificant negative association with *ROE*. Besides, the association between the CEO duality, *CD*, and *ROE* is positive and significant at a 5% significance level. The CEO duality can be concluded to positively, not negatively, influence the firm performance. Hypothesis *H2* is rejected. Foreign ownership, *FO*, has an insignificant positive association with *ROE*. Thus, hypothesis *H3* is rejected. Besides, the association between China's domestic private ownership, *PO*, and *ROE* is positive but insignificant. State ownership, *SO*, has an insignificant and negative association with *ROE*. Thus, hypothesis *H4* is rejected. On the other hand, the state control firm attribute, *SC*, positively and significantly associates with *ROE* at a 5% significance level. Thus, the state control firm attribute, *SC*, can be concluded to positively, not negatively, influence the firm performance of Chinese dual-listed companies. Hypothesis *H5* is rejected. The firm size, *FS*, is positively associated with *ROE* at a 1% significance level.

While the leverage ratio, *LEV*, is negatively associated with *ROE* at a 5% significance level. Both the financial firm attribute, *FIN*, and the stock return volatility, *VOL*, have insignificant associations with *ROE*.

Even though *SO* and *PO* are moderately correlated, their collinearity issue is insignificant. As deleting *PO* (*SO*) from the regression model does not cause a significant change in the sign, magnitude, and p-value of the regression coefficient of *SO* (*PO*) (relevant data not shown in this paper).

Table 4. Regression results

Variable	<i>ROA</i>		<i>ROE</i>	
	Random Effects		Random Effects	
	Coefficient	p-value	Coefficient	p-value
<i>C</i>	-0.1565*** (-4.0761)	0.0009	-0.7170*** (-3.4787)	0.0031
<i>ID</i>	-0.0297 (-1.4066)	0.1787	-0.1563** (-2.3313)	0.0331
<i>BS</i>	-0.0014** (-2.5655)	0.0207	-0.0031 (-1.2562)	0.2271
<i>CD</i>	0.0088** (2.1525)	0.0470	0.0244** (2.5534)	0.0213
<i>FO</i>	0.0006*** (5.0587)	0.0001	0.0009 (0.8165)	0.4262
<i>SO</i>	-0.0002* (-1.9311)	0.0714	-0.0009 (-1.7327)	0.1024
<i>PO</i>	0.0005*** (3.2439)	0.0051	0.0009* (2.0860)	0.0533
<i>SC</i>	0.0255*** (3.4154)	0.0035	0.0577** (2.4515)	0.0261
<i>FS</i>	0.0106*** (7.0231)	0.0000	0.0407*** (3.5472)	0.0027
<i>LEV</i>	-0.1419*** (-15.1383)	0.0000	-0.2979** (-2.5164)	0.0229
<i>FIN</i>	-0.0073** (-2.6465)	0.0176	0.0199 (1.3817)	0.1861
<i>VOL</i>	-0.0001 (-0.0930)	0.9270	-0.0004 (-0.1203)	0.9057
R-squared	0.2736		0.1023	

Note: ***, **, and * significance at 1%, 5%, and 10% level, respectively. The numbers shown in parentheses are the t-statistics of the estimated coefficients.

6. Discussion and Implication

The findings in our paper have the following implications. First, as depicted from the regression results in Table 4, the regression coefficients of the independent director ratio are all negative, in which the independent director ratio has an insignificant negative association with *ROA* but has a significant negative association with *ROE*, implying that independent directors do not mitigate agency costs and do not improve Chinese dual-listed companies' firm performance. The findings of the independent director ratio in our paper are consistent with those of Boateng et al. (2017) and Wang et al. (2017) who observe that the appointed independent directors for Chinese companies are not truly independent and do not mitigate the agency problems. Moreover, the board size is found to have negative coefficients in the regressions with both *ROA* and *ROE*, implying that more board members could damage the firm performance. The findings in our paper suggest that independent directors and board members should be employed to satisfy the stringency of listing rules and requirements from the laws for the Hong Kong market, but they could not improve the firm performance. The regression results of both the independent director ratio and board size are in line with the traditional culture of Chinese companies in which only founders' relatives or friends who have good connections with the controlling shareholders are appointed to be independent directors or board members (Rathnayake, Kassi, Louembe, Sun, & Ning, 2019; Boateng et al., 2017; Wang et al., 2017). Nevertheless, the legal bonding effects are not found in this study.

Second, we find that CEO duality has significant positive associations with both *ROA* and *ROE*. The findings in our regression results are inconsistent with the literature, see, for example, Chakraborty et al. (2019) and Mathew et al. (2016) who find that the consensus of CEO duality's positive relationship with agency costs that are supposed to deteriorate the firm performance. The findings of the positive influence of CEO duality on firm performance in our paper could be because the persons who take up the dual roles of both CEO and chairman in Chinese companies are usually the companies' founders and experts in the companies' industries. The knowledge, motives, and expertise of the founders are the main factors that effectively generate more firm value and improve the firm performance of Chinese dual-listed companies. Nonetheless, the findings of the CEO duality that positively influences the firm performance of Chinese dual-listed companies are, to a certain extent, consistent with the unity of command effect observed by Pham & Pham (2020).

Third, our paper documents that foreign ownership is significantly and positively associated with *ROA* but has an insignificantly positive association with *ROE*, implying that foreign ownership is positively related to firm performance in terms of only *ROA* but not *ROE*. Since foreign investors monitor the managerial team and the controlling shareholders of the companies, their roles are to improve corporate governance and mitigate agency costs. The regression results of foreign ownership in our paper are consistent with the findings of Vo (2015), Aloui & Jarboui (2018), and Daraghma (2016), who find positive monitoring roles of foreign investors on firm performance.

Forth, our paper observes that state ownership is insignificantly and negatively associated with both *ROA* and *ROE*, inferring that state ownership does not have any impact on the performance of Chinese dual-listed companies. However, the two regression coefficients of state ownership displayed in our paper are negative, even though insignificant, implying that

the increase in state ownership would worsen, though insignificant, the firm performance. The negative relationship between state ownership and firm performance is in parallel with the findings of Daraghma (2016), Sabbaghi (2016), and Liljeblom et al. (2020) who document that poor corporate governance and firm performance are prevalent in companies with highly concentrated state ownership.

Last, the state-control firm attribute is found to have significant positive associations with both *ROA* and *ROE*, implying that the state-control firm attribute has significant positive impacts on firm performance and the impacts are opposite to that of state ownership. Since for the state-controlled Chinese companies, the China government is the controlling shareholder and appoints political officers and professional executives to run the companies on behalf of the China government, the state control firm attribute represents the ownership rights plus the manipulation rights (Lin et al., 2020). In contrast, state ownership represents ownership rights, but may not represent manipulation rights. Therefore, state-controlled Chinese companies have a stronger political connection to China government. The finding of the state control status improves the firm performance in our paper is consistent with the findings of Yu (2013) and Chang & Wong (2004) who document that Chinese companies with highly concentrated state ownership benefit from political connections to China government, such as the monopolization of scarce national resources and financial support during the adverse market environment. However, the regression results in our paper indicate that the influence of state control firm attribute is opposite to that of state ownership.

In summary, our paper finds that both the independent director ratio and board size could worsen the firm performance in terms of both *ROE* and *ROA*, respectively. On the other hand, we do not observe any legal bonding effects on the firm performance in this study. However, our findings show that CEO duality positively influences the firm performance in terms of both *ROA* and *ROE*, the presence of foreign investors positively influences the firm performance in terms of *ROA* only, and the influence of state ownership on firm performance is negative but insignificant. The state control firm attribute, representing the ownership rights and manipulation rights of China government, is found to positively influence the firm performance in terms of both *ROA* and *ROE*. On the other hand, we find that the state control firm attribute has an opposite influence on firm performance to that of the state ownership. Thus, the CEO duality and the state control firm attribute are the two determinant factors that positively influence Chinese dual-listed companies' firm performance.

Besides, more research works have to be done to explore the effectiveness of legal bonding theory in different host markets. In addition, the use of state control firm attribute to proxy the political connection to the government may be more appropriate than state ownership. It is because the state ownership in Chinese private companies that companies' founders manipulate does not represent government manipulation rights, and hence the political connection to China government. Thus, later researchers may separately consider the influences between ownership rights and manipulation rights when analyzing government intervention in companies.

7. Conclusion

This study examines the impacts of both corporate governance mechanisms and ownership structure on the firm performance of Chinese dual-listed companies which form a specific class of cross-listed companies having core business in China and list their shares in both the China A-share market and the Hong Kong market simultaneously. To do so, we select 100 Chinese dual-listed companies consisting of 941 firm-year observations from 2003 to 2019 in our study and use both *ROA* and *ROE* to proxy the firm performance.

In our paper, we find that the independent variable having significant associations with both *ROA* and *ROE* in the same sign significantly influences the firm performance of Chinese dual-listed companies. The regression results show that both the independent director ratio and board size worsen the firm performance in terms of both *ROE* and *ROA*, respectively, and they do not contribute to the mitigation of agency costs or the improvement of firm performance. However, we do not observe any legal bonding effects on the firm performance in this study. On the other hand, we find that contrary to the consensus of CEO duality's negative effects on firm performance in literature, CEO duality positively influences the firm performance in terms of both *ROA* and *ROE*. Besides, foreign ownership is found to be positively related to firm performance in terms of *ROA* only, while state ownership is found to insignificantly and negatively influences firm performance. However, the state control firm attribute, representing the ownership rights and manipulation rights of China government, positively influences the firm performance in terms of both *ROA* and *ROE*. Thus, we conclude that the CEO duality and the state control firm attribute are the two determinant factors that positively influence Chinese dual-listed companies' firm performance. China's domestic private ownership significantly and positively associates with *ROE*, while the firm size exhibits a significant and positive influence on the firm performance in terms of both *ROA* and *ROE*. In contrast, the influence of the leverage ratio on firm performance is negative and is opposite to that of firm size, the financial firm attribute negatively relates to *ROA*, and no significant influence on firm performance is found in stock return volatility.

However, there are some limitations in this study. One of them is the human error that occurs from the computation of data in the observations. It is because each data used in the analysis is collected and calculated manually. For instance, the misclassification of ownership type could happen when a Chinese domestic private investor with an English name in the Hong Kong market is wrongly classified to be a foreign investor. Another limitation is the small number of companies selected for this study. It is because the number of Chinese dual-listed companies is only 114 companies from 2003 to 2019 and 14 Chinese dual-listed companies having missing or incomplete data are discarded, and thus, only 100 Chinese dual-listed companies are finally retained and selected in this study. Hence, future research could include investigating how the corporate governance mechanisms and ownership structure affect the firm performance of dual-listed or multi-listed companies from other emerging markets that cross-list to developed markets, such as the US and London markets. To the best of our knowledge, this is the first dedicated study to examine the impactful effects of both corporate governance mechanisms and ownership structure on Chinese dual-listed companies' firm performance proxied by both *ROA* and *ROE*. These study's results complement the prior research papers related to the field of cross-listing in literature and provide valuable reference

information for investors to evaluate the firm performance of Chinese dual-listed companies. Policymakers are recommended to enhance the listing rules and laws to ensure Chinese companies' independent directors and other board members act diligently to improve firm performance.

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