Corporate Governance Codes and Intellectual Capital: Evaluating the Performance Impacts among Government-Linked Companies in Malaysia and Singapore – A Panel Data Analysis

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Abstract. The objective of this study was to examine and compare the effects of corporate governance (CG) and intellectual capital (IC) between Malaysia Government-Linked Companies' (M-GLCs) and Singapore Government-Linked Companies' (S-GLCs) firm performance (FP). Panel data analysis was employed to analyse the impact of CG's variables and IC's variables on FP. FP was measured by Return on Total Assets (ROA), Tobin's Q and Earnings Per Share (EPS). Data was gathered from the website of Bursa Malaysia and the Stock Exchange of Singapore from 2005 to 2018. The sample size of this research was 60 GLCs which comprised of 34 M-GLCs and 26 S-GLCs. There were a total 840 firm year observations. Results indicated that CGs of S-GLCs have greater impact on FP when compared to M-GLCs while the findings of the IC of M-GLCs have greater impact on FP compared to S-GLCs. This research was helpful in offering further insights of CG practices and IC efficiency to the Government, Board of Directors, policy makers, shareholders and stakeholders.

1 Introduction

Government-linked companies (GLCs) play a widespread and pervasive role in the economy of Malaysia and Singapore. Malaysia was ranked as fifth-highest in the world in terms of countries that have the highest GLCs existence among its largest firms (Kowalski, Buge, Sztajerowska, & Egeland, 2013). The formation of Singapore GLCs in the late 1960s was to promote industrialization and development in strategic industries of the economy (Chen, 2016). According to Vitolla, Raimo and Rubino (2020), the Board composition must be responsive to the essential tasks that were assigned to them, for instance, avoiding conflict of interest with shareholders, supervising and monitoring the company and providing suggestions to top management which will lead to enhance a firm's FP. Boateng, Manu and Adesi (2019) found that purposes of CG were to reinforce the companies' structure for transparency, efficient performance and trust among all stakeholders of the company. Ibrahimy and Raman (2019) mentioned that the physical assets, such as, land, inventories, buildings and machinery was not only the indicator to determine the growth of the world,

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nation, business or company; it can also be determined by the growth by IC, it can be transferred into profit but is not reflected on the financial statements.

1.1 Problem Statement

According to Soei, Setiawan and Fitriani (2019), good CG became a critical issue from the Asian Financial Crisis in 1997. However, most research examined the effects of CG on Public-Listed Companies (PLCs) FP but not on M-GLCs (Mohamad, Pantamee, & Keong, 2020; Tan & Patricia, 2020) and S-GLCs (Chen, 2019; Duppati, Rao, Matlani, & Scrimgeour, 2019). Even though the number of research studies on CG topic had recently increased, there was still an absence of research that examined and compared the effects of CG between M-GLCs and S-GLCs FP. Besides, the effect of IC on FP was rarely studied. For instance, Ibrahimy and Raman (2019) and Kweh, Ting, Hanh, and Zhang (2019), explored the influence of IC on FP among Malaysia PLCs but not GLCs. Research conducted on the influence of IC on FP among Singapore PLCs was limited, such as Tan, Plowman, & Hancock (2007) while no research was conducted on the effects of IC on FP among S-GLCs. The effects of CG and IC on FP was being conducted in most of the existing empirical literature, but there were inconsistent outcome, for instance, Haq, Zhao and Rehman (2020), Ullah and Kamal (2020) and Shachi, Jophi and Prakash (2020) provided the mixed results. Hence, this research was carried to further study and examine the effects of CG and IC between M-GLCs and S-GLCs FP in order to narrow up the gap of outcomes.

2 Literature Review and Hypothesis Development

To analyze CG and IC, a few of the theoretical frameworks were introduced. Each of these frameworks come from different disciplines through numerous studies that were conducted.
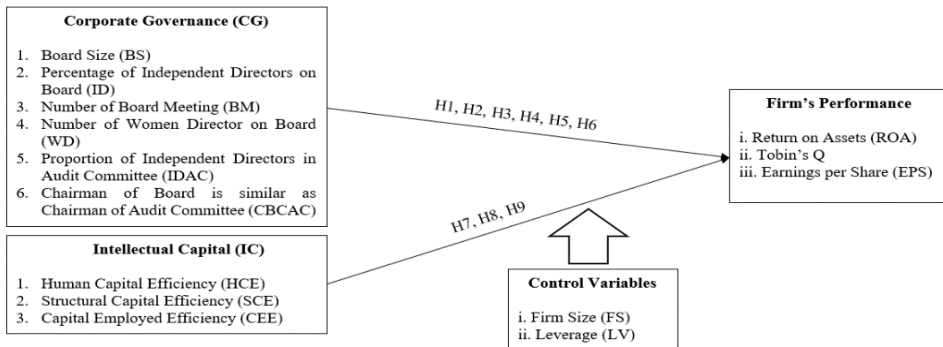

Fig. 1. Proposed Theoretical Framework.

2.1 Relationship between Board Size (BS) and Firm Performance

The optimum BS was able to oversee the operation and management of the firm successfully and enhance the profit of shareholders (Kao, Hodgkinson, & Jaafar, 2019). According to Puni and Anlesinya (2020), agency theory recommended that the appropriate BS was able to improve communication and harmonisation on the Board. They argued that a larger BS might increase agency costs because the Boards have the probability of losing direction and face communication challenges. Most prior research found that a larger BS was less effective in improving FP as it required high monitoring costs, which consistent with agency theory

(Younas, Klein, & Trabert, 2019). According to Syajarul and Shifa (2019), the high levels of conflict and low levels of group cohesion might happen in the large BS.

    H_{1A}:BS of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
    H_{1B}: BS of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
    H_{1C}: BS of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.2 Relationship between Percentage of Independent Directors on Board (ID) and Firm Performance

According to Dionne, Chun and Triki (2019), IDs or external directors would not collude with the chairman of the Board or CEO to threaten shareholders' interest because they play their supervisory role effectively. Therefore, a Board should involve independent directors to keep safe the interest of shareholders and improve FP (Masulins & Zhang, 2019). In the study of Merendino and Melville (2019), they stated that IDs has a significant positive relation with FP under the agency theory. This is because a higher number of IDs may have more active monitoring roles and limit managerial opportunism. On the contrary, Kweh, Ahmad and Ting (2019) concluded that the correlation between IDs and FP was negative as IDs were external directors, they did not possess the power to impact the decisions and actions made by the CEO in order to secured shareholders' wealth.

    H_{2A}: IDs of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
    H_{2B}: IDs of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
    H_{2C}: IDs of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.3 Relationship between Number of Board Meetings (BM) and Firm Performance

According to Ji, Talavera and Yin (2020), BM was the most easily practiced Board activity, and it was mandatory in public companies in order to enhance the Board effectiveness. In stewardship theory, the steward will feel autonomously secure and maximise the interests of their principals in term of FP (Obermann, Velte, & Gerwanski, 2020). The BODs and managers represented the steward, while the principal referred to the shareholders or the owners (Wijethilake & Ekanayake, 2019). BM had a significant impact on FP because of strategic guidance about investment opportunities (Wang, Abbasi, & Babajide, 2020). According to Arulvel and Pratheepkanth (2019), conflict of interest and the agency cost can be effectively diminished by the decisions made during BM.

    H_{3A}: BM of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
    H_{3B}: BM of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
    H_{3C}: BM of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.4 Relationship between Number of Women Directors in Board (WD) and Firm Performance

Gender diversity can be enforced with the presence of WD on the Board (Ying & Rayappan, 2020). The exclusive supervision style and comprehensiveness of WD could form the dynamics of the Board and enhance the FP (Larkin, 2020). WD would encourage the participative environment with changed and improved the communications and negotiations style on Board (Kanojia & Khanna, 2019). As aligned with agency theory, WD was able to improve FP by improving Board independence and monitoring functions (Wahid, 2019). On the other hand, Einarsdottir, Rafnsdottir and Sigrun (2020) stated that Board homogeneity were not link to gender issues. According to Rekha (2019), WD was unable to improve the FP because the Board diversity may give rise to conflicts and disagreements among the BODs.

H_{4A}: WD of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
H_{4B}: WD of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
H_{4C}: WD of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.5 Relationship between Proportion of Independent Directors in the Audit Committee (IDAC) and Firm Performance

Norziaton and Hafizah (2019) stated that the main requirement of a competent audit committee where it should be independent from the management of the company. Farooque, Buachoom, and Sun (2020) concluded that the firm should have high IDAC in order to secure the rights and benefits of stakeholders and thus enhance the FP. This viewpoint was similar to the stakeholder theory, which argued that the success of the firm primarily relies on the informational and interests needs of its major stakeholders, for instance, the government, employees and customers. In additions, the non-executive directors would possess the capability to eliminate the issues of financial statement manipulation (Astami & Rusmin, 2020). In short, FP and shareholder's wealth can be improved by high IDAC, because there have better supervising functions of the Board.

H_{5A}: IDAC of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
H_{5B}: IDAC of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
H_{5C}: IDAC of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.6 Relationship between Chairman of Board is similar as Chairman of the Audit Committee (CBCAC) and Firm Performance

According to the Practice 8.1 of MCCG 2017, it stated that the chairman of the Board could not hold the position as the chairman of the audit committee. The chairman of the audit committee not only must be an independent director, but he or she also should not hold the position of chairman of the Board. There is a conflict of interests in the findings and recommendations of the audit committee if the person holds these two positions at the same time. CBCAC may cause the issue of concentration of the control power that is held by a single director. Additionally, according to the Standard 12.4 of Bank Negara Malaysia's Policy Document on Corporate Governance, it suggested that it is necessary for the financial institution to support a distinction of CBCAC. There is a need to split these two positions because it would allow the chairman of the audit committee to assign enough time to deal with the events in the audit committee. CBCAC would cause a particular director to have overloaded responsibilities and duties, leading to diminished performance of a particular director.

H_{6A}: CBCAC of M-GLCs have a greater impact on ROA compared to that of S-GLCs.
H_{6B}: CBCAC of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.
H_{6C}: CBCAC of M-GLCs have a greater impact on EPS compared to that of S-GLCs.

2.7 Relationship between Human Capital Efficiency (HCE) and Firm Performance

Ting, Ren and Chen (2020) stated that the experiences, skills and knowledge that are held by employees were known as human capital. Ramirez, Soto and Manzaneque (2020) recognized that human capital was the most significant asset in an organization supported from resource-based view (RBV) theory. The most significant resource to the enhance the FP was IC under the concept of RBV, which was known as the knowledge resources owned by a firm, for instance, reputation, know-how and patents (Castro, Vial, & Verde, 2019). HCE represented the index of value-added efficiency of human capital (Tran & Vo, 2020). The experienced,

brilliant and motivated human capital would able to increase the FP (Baig, Rehman, & Latif, 2019). Ousama, Hammami and Abdulkarim (2020) stated that HCE plays a significant role in creating company value through differentiating its products and services and reducing the production costs.

H_{7A}: *HCE of M-GLCs have a greater impact on ROA compared to that of S-GLCs.*
H_{7B}: *HCE of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.*
H_{7C}: *HCE of M-GLCs have a greater impact on EPS compared to that of S-GLCs.*

2.8 Relationship between Structural Capital Efficiency (SCE) and Firm Performance

Structural capital covered the organization and infrastructure properties, for instance, database, system and process (Ting, et al. 2020). SCE was a proxy used to measure the value-added efficiency of structural capital (Bayraktaroglu, et al. 2019). On the study of Ramirez, Soto and Manzaneque (2020), SCE represented the critical weapon for the firm in this knowledge age, because it generated the architecture and tools for shifting, establishing, continuing and strengthening knowledge throughout the firm operations. Prado, Severiche and Mendoza (2020) noted that the firm which was master and proficient in knowledge management practices would utilize their resources more creatively and efficiently. Most past studies noted that effective implementation of structural capital was significant to generate higher FP because the capabilities of a firm to offer customers with premium quality products and services will be subject to its productive investment in elements related to structural capital (Bayraktaroglu, et al. 2019).

H_{8A}: *SCE of M-GLCs have a greater impact on ROA compared to that of S-GLCs.*
H_{8B}: *SCE of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.*
H_{8C}: *SCE of M-GLCs have a greater impact on EPS compared to that of S-GLCs.*

2.9 Relationship between Capital Employed Efficiency (CEE) and Firm Performance

Hsieh, Kiong and Asif (2020) defined the results of capital employed was the differences between total resources and intangible resources. According to Pratama, Innayah and Darmawan (2019), the efficient utilization of financial and physical capital was measured by CEE. In other words, CEE represented the efficiency of a firm to create value by utilizing its financial capital (Bayraktaroglu, et al. 2019). According to the findings of Oppong, Pattanayak and Irfan (2019), they found that CEE was significant and important in enhancing FP. Besides, Nimtrakoon (2015) argued that CEE and HCE were the most important drivers for market value and corporate performance. Results in the research of Ousama, Hammami and Abdulkarim (2020) showed an affirmative and significant relationship between CEE and FP.

H_{9A}: *CEE of M-GLCs have a greater impact on ROA compared to that of S-GLCs.*
H_{9B}: *CEE of M-GLCs have a greater impact on Tobin's Q compared to that of S-GLCs.*
H_{9C}: *CEE of M-GLCs have a greater impact on EPS compared to that of S-GLCs.*

2.10 Control Variables

Muslih, Sirait and Simanjuntak (2020) suggested that control variables (CV) are the variables that are not the main interest of this research. In order to avoid CV from interfering in the analysis of the impact of IVs on DVs, this research would cancel or neutralize it in the study. CV adopted in this research were firm size (FS) and Leverage (LV). According to Aslam, Ahmad and Amin (2018), the FS can be measured by the total assets of the company. Song,

Lee and Kang (2021) stated that the larger FS were able to enjoy economies of scale and market power advantages, thus, it will be increased FP. Enache and Hussainey (2020) stated that LV could be measured by divided total liabilities with total assets of the firm. According to Rejeb and Missaoui (2019), the FP might be affected by the debt level because of the risk of default and costs of finance.

2.11 Measurement of Firm Performance

This paper proposed to use Return on Assets (ROA), Tobin's Q and Earnings per Share (EPS) for measuring FP. ROA was used as a corporate performance indicator when measured the capability of the company to generate earnings and returns for its shareholders (Zabri, Ahmad, & Wah, 2016). Tobin's Q was adopted to evaluate FP because it can show the potential of the company to earn a future return (Ying & Rayappan, 2020). EPS was a market-based indicator as it allowed comparing with existing studies and it can be utilised as a robustness check for the research findings (Kiplagat, 2020).

3 Methodology

The impact of CG variables and IC variables on FP of M-GLCs and S-GLCs were examined and compared. Data was extracted from 14 years' annual reports commencing from 2005 to 2018. Total sample size was 60 companies, which comprised of 34 M-GLCs and 26 S-GLCs. These GLCs were listed on Bursa Malaysia and Stock Exchange of Singapore respectively. Panel data analysis was adopted to examining the impact of CG and IC on FP for the two countries. Two categories of panel data analytic models used in this research study, which was the fixed-effect model and random effect model (Fitrianto & Musakkal, 2016). The equation of dependent variables for panel data analysis was as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 FS_{i,t} + \beta_2 LV_{i,t} + \beta_3 BS_{i,t} + \beta_4 ID_{i,t} + \beta_5 BM_{i,t} + \beta_6 WD_{i,t} + \beta_7 AC_{i,t} + \beta_8 CA_{i,t}$$
$$ + \beta_9 HCE_{i,t} + \beta_{10} SCE_{i,t} + \beta_{11} CEE_{i,t}$$
$$ + \varepsilon_{i,t} \qquad (1)$$
$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 FS_{i,t} + \beta_2 LV_{i,t} + \beta_3 BS_{i,t} + \beta_4 ID_{i,t} + \beta_5 BM_{i,t} + \beta_6 WD_{i,t} + \beta_7 AC_{i,t}$$
$$ + \beta_8 CA_{i,t} + \beta_9 HCE_{i,t} + \beta_{10} SCE_{i,t} + \beta_{11} CEE_{i,t}$$
$$ + \varepsilon_{i,t} \qquad (2)$$
$$EPS = \beta_0 + \beta_1 FS_{i,t} + \beta_2 LV_{i,t} + \beta_3 BS_{i,t} + \beta_4 ID_{i,t} + \beta_5 BM_{i,t} + \beta_6 WD_{i,t} + \beta_7 AC_{i,t} + \beta_8 CA_{i,t}$$
$$ + \beta_9 HCE_{i,t} + \beta_{10} SCE_{i,t} + \beta_{11} CEE_{i,t}$$
$$ + \varepsilon_{i,t} \qquad (3)$$

β_0 = Intercept for the regression model
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}$ = Partial regression coefficients
i = Observation number in a cross − sectional data set
t = Observation number in a time − series data set
ε = Error terms of the regression model

4 Results and Discussion

Table 1. Hypothesis Testing Summary of ROA, Tobin's Q and EPS Results.

	ROA		Tobin's Q		EPS	
	MY	**SG**	**MY**	**SG**	**MY**	**SG**
	14 yrs	**14 yrs**	**14 yrs**	**14 yrs**	**14 yrs**	**14 yrs**
Constant	0.731	0.051	0.353	0.158	0.748	0.450
FS	0.100	0.750	0.200	0.119	**+0.000*****	**+0.000*****

LV	**-0.000***	**-0.000***	**+0.000***	**+0.000***	**-0.000***	0.354
BS	0.392	**+0.000***	0.978	**+0.039**	0.687	0.183
ID	0.210	**+0.001***	0.294	0.758	0.610	**+0.056***
BM	0.821	0.760	**+0.037**	**+0.081***	0.323	**-0.007***
WD	0.929	**-0.005***	**+0.001***	**+0.085***	0.981	0.239
IDAC	**+0.045**	0.864	0.312	0.100	0.940	0.902
CBCAC	0.338	0.807	0.864	0.886	**-0.000***	0.691
HCE	**+0.000***	**+0.002***	**+0.000***	0.104	**+0.000***	0.220
SCE	0.672	**+0.001***	0.805	0.698	0.343	0.434
CEE	**+0.000***	**+0.000***	0.664	**+0.011**	**+0.002***	**-0.042**

***. Correlation is significant at the 0.01 level.
**. Correlation is significant at the 0.05 level.
*. Correlation is significant at the 0.1 level.

Table 2. Hausman Test.

Dependent Variables	P-Value		Remarks* (Fixed Effect or Random Effect)	
	MY	**SG**	**MY**	**SG**
ROA	0.000	0.002	Fixed Effect Model	Fixed Effect Model
Tobin's Q	0.030	0.312	Fixed Effect Model	Random Effect Model
EPS	0.015	0.027	Fixed Effect Model	Fixed Effect Model

*Use Fixed Effect Model when P-Value ≤0.05; Ramdom Effect Model when P-Value >0.05.

Table 3. Summary of Hypothesis Testing of M-GLCs and S-GLCs.

IVs	Research Hypothesis	Panel Data Analysis	Research Hypothesis	Panel Data Analysis	Research Hypothesis	Panel Data Analysis
BS	H_{1A}	R	H_{1B}	R	H_{1C}	I
ID	H_{2A}	R	H_{2B}	I	H_{2C}	R
BM	H_{3A}	I	H_{3B}	A	H_{3C}	R
WD	H_{4A}	R	H_{4B}	A	H_{4C}	I
IDAC	H_{5A}	A	H_{5B}	I	H_{5C}	I
CBCAC	H_{6A}	I	H_{6B}	I	H_{6C}	A
HCE	H_{7A}	A	H_{7B}	A	H_{7C}	A
SCE	H_{8A}	R	H_{8B}	I	H_{8C}	I
CEE	H_{9A}	I	H_{9B}	R	H_{9C}	A

A=Accept
R=Reject
I=Inconclusive

In Hypothesis 1, results generated by the Panal Data rejected H_{1A} and H_{1B} while H_{1C} was inconclusive. This was consistent with the study of Abdulrasheed and Hamidu (2020), Rashid and Pervin (2019) and Vaidya (2019). From the analysis, it can be summarized that the BS of S-GLCs has greater impact on ROA and Tobin's Q when compared to M-GLCs. From Hypothesis 2, the analysis from Panel Data rejected H_{2A} and H_{2C} while H_{2B} was inconclusive. The findings were similar to the previous studies, such as Mustapha, Rashid and Bala (2020), Salleh, Lee and Joshi (2019) and Nwanne and Okonkwo (2019). The IDs of S-GLCs have greater impact on ROA and EPS compared to M-GLCs. In Hypothesis 3, results from Panel Data accepted H_{3B} and did not accepted H_{3C}, while H_{3A} was inconclusive. The findings was identical with the study of Qudah, Azzam and Aleqab (2020), Mayur and Saravanan (2017) and Abdeljawad and Masri (2020). The BM of M-GLCs have greater impact on Tobin's Q

compared to that of S-GLCs while the BM of S-GLCs have greater impact on EPS compared to M-GLCs. From Hypothesis 4, H_{4B} was accepted and H_{4A} was rejected while H_{4C} was inconclusive based on the Panel Data Analysis. The findings were supported by the research of Mustapha, Rashid and Bala (2020), Rashid and Pervin (2019) and Abdeljawad and Masri (2020). In conclusion, the WD of M-GLCs showed greater impact on Tobin's Q compared to that of S-GLCs while the WD of S-GLCs have greater impact on ROA compared to M-GLCs. Results of Hypothesis 5 from the Panel Data accepted H_{5A} while H_{5B} and H_{5C} were inconclusive. This was consistent with the research of Salleh, Lee and Joshi (2019), Farooque, Buachoom and Sun (2020) and Adhikary and Mitra (2016). In short, the IDAC of M-GLCs have greater impact on ROA compared to S-GLCs. In Hypothesis 6, results from the Panel Data accepted H_{6C} while H_{6A} and H_{6B} were inconclusive. In summary, the CBCAC of M-GLCs have greater impact on EPS compared to S-GLCs. Outcomes of Hypothesis 7 from the Panel Data accepted H_{7A}, H_{7B} and H_{7C}. The results corresponded with the research of Xu and Li (2019), Ghasemi, Rostami and Mahdavirad (2019) and Nassar (2018). In conclusion, the HCE of M-GLCs have greater impact on ROA, Tobin's Q and EPS compared to S-GLCs. Results of Hypothesis 8 from the Panel Data rejected H_{8A} while H_{8B} and $H1_{8C}$ were inconclusive. The results were similar to the prior research, for instance, Buallay, Cummings and Hamdan (2019), Hamdan (2018) and of Ahmad and Ahmed (2016). In short, the SCE of S-GLCs have greater impact on ROA compared to M-GLCs. In Hypothesis 9, findings from the Panel Data accepted H_{9C} and rejected H_{9B} while H_{9A} was inconclusive. The findings was consistent with the past studies, such as Chowdhury, Rana and Azim (2019), Buallay, Cummings and Hamdan (2019) and Ahmad and Ahmed (2016). In short, the findings were unable to conclude CEE because of both M-GLCs and S-GLCs have the same significant impact on ROA; S-GLCs have greater impact on Tobin's Q compared to M-GLCs and M-GLCs have greater impact on EPS compared to S-GLCs.

5 Conclusion and Recommendations

The objective of the study was to examine and determine the impact of CG variables and IC variables between M-GLCs' and S-GLCs' FP. A summary of conclusive notes was drawn. In general, the CG variables of S-GLCs have greater impact on FP compared to M-GLCs based on the number of significant variables, for instance, BS, ID, BM, and WD. M-GLCs should improve implementing appropriate CG recommendation in order to maximize shareholders' wealth. In addition, IC variables of M-GLCs revealed greater impact on FP than S-GLCs. It can be concluded that CG variables of S-GLCs have greater impact on FP compared to M-GLCs while the findings of the IC variables of M-GLCs have greater impact on FP compared to S-GLCs. Future research could conduct that collects secondary data from companies' annual reports and also gather primary data by distributing questionnaires. Further research can expand the sample size by involving the GLCs of other countries.

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