

Original Paper

Corporate Governance and Financial Performance of State-Owned Enterprises Compared to Listed Firms in Zambia: 2002-2017

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Abstract

The study was a comparative analysis of the corporate governance practices and firm financial performances between State-Owned Enterprises and listed firms in Zambia. Using a cross-sectional panel data set covering the period 2002 to 2017, the t-test statistic was employed to compare the corporate governance practices and firm financial performances between unlisted State-Owned Enterprises, listed State-Owned Enterprises and listed private firms. It was found that corporate governance practices and firm financial performances between State-Owned Enterprises and listed firms in Zambia were significantly different. The board sizes for listed firms were statistically significantly less than those of State-Owned Enterprises and the proportion of non-executive directors on the boards of listed firms were also statistically significantly less than those of State-Owned Enterprises. On the other hand the proportion of female directors on listed firms were statistically significantly more than those of unlisted State-Owned Enterprises. In terms of firm financial performance, it was found that the mean of the Return on Total Assets for listed private firms was statistically significantly greater than the mean for unlisted State-Owned Enterprises. There were significant effect sizes in all the measured variables. This was a country specific study that contributed to the empirical knowledge on corporate governance practices and financial performances in State-Owned Enterprises and listed firms. The findings are of interest to researchers, corporate governance practitioners and government policy makers.

Keywords

Corporate Governance, State-owned Enterprises, Firm Financial Performance, Listed firms

1. Introduction

Corporate governance practices and their effect on firm financial performance is an area that has been empirically researched by many scholars. However, there is lack of country specific empirical studies on the comparison between corporate governance practices and firm financial performances between unlisted State-Owned Enterprises (SOEs), listed SOEs and listed private firms. Mumba (2017) investigated the effect of gender diversity on firm performance on listed firms in Zambia but did not carry out a comparison of corporate governance practices and financial performances between unlisted State-Owned Enterprises (SOEs), listed SOEs and listed private firms. Another study by Mumba and Kazonga (2021) documented the corporate governance practices and firm financial performance in SOEs in Zambia and again this study did not conduct a comparison between corporate governance practices and firm financial performances between unlisted State-Owned Enterprises (SOEs), listed SOEs and listed private firms. Consequently, there is a knowledge void and an empirical gap that this study aimed to narrow through its findings. This study, therefore, conducted a comparative analysis of the corporate governance practices and firm financial performances between unlisted SOEs, listed SOEs and listed private firms in Zambia from 2002 to 2017.

The foundational argument in the study was that the financial performance of firms was affected by corporate governance practices or attributes. Underlying this foundational argument is the agency theory primarily but also the stakeholder, political economic and institutional theories. It is also argued that corporate governance is affected by various factors which include firm level factors, industry and country in which a firm is domiciled. In this study firm ownership was explored in terms of state ownership of SOEs and private firms and the study was carried out in Zambia.

2. Literature Review

2.1 Importance of Corporate Governance

Corporate governance was found to matter in the financial performance of firms as a number of studies have shown that well governed firms, recorded superior financial performance compared to poorly governed firms (Valls, 2016). Specifically, good corporate governance practices affected firm financial performance in the following ways:

- i. Efficient operations resulting in higher returns as measured by Return on Total Assets (ROTA), Return on Investment (ROI), Return on Equity (ROE) (Jensen and Meckling, 1976; Cretu, 2018);
- ii. Low risk with reduced cost of capital, leverage and financing policy (Cretu, 2018);
- iii. Increased premiums on shares of firms in emerging markets (IFC, 2006; Khanna and Zyla, 2016);
- iv. For developing countries improved FDI inflows (Abdo and Fisher, 2007);
- v. Increased access to outside capital (World Bank, 2006); and
- vi. Improved profitability of SOEs that were privatised (Hanousek and Kočenda, 2003).

The importance of corporate governance in SOEs in particular, was well articulated by Grossi et al. (2015, p. 274) who suggested that:

“Public service provision and budget consolidation cannot be realized effectively and efficiently without powerful governance and management of SOEs... Effective mechanisms and good practices may contribute to better performance of SOEs. The empirical data about the relevance of SOEs prove that a sustainable public service provision and budget consolidation in many areas cannot be realized in an effective and efficient way without powerful management and control of SOEs.”

To buttress the significance of the importance of corporate governance, Guo et al. (2013, p. 257) opined that:

“The Chinese Government has made efforts to strengthen the effectiveness of corporate governance in state-owned enterprises. However, existing research shows that some governance mechanisms that are effective in Western countries have no significant or negative impacts on firm financial performance in China apparently due to the strong relationship between state-owned enterprises and the government.”

Based on the literature review, it was observed that Corporate Governance was particularly relevant in the management and financial performance of firms. Research in corporate governance is particularly concerned with the association between corporate governance attributes and firm financial performance. It was observed that increasingly corporate governance affects both a country's economic stability and its growth prospects and in particular corporate governance was a crucial factor in the decision taken by investors when investing in emerging markets and investors paid a premium for better governed emerging market firms. Corporate governance therefore mattered to potential investors in emerging market firms like those firms operating in Zambia.

2.2 Factors that Affect Corporate Governance

Corporate Governance as a social construct is affected by many factors. These include firm level characteristics, industry characteristics, national culture, national laws, corporate governance codes and firm ownership structure. Board size and board composition as examples of corporate governance factors that were found to be affected by firm level characteristics by Kyereboah-Coleman and Biekpe (2007). Other firm level characteristics included firm level risk and CEO tenure (ibid.). Li and Harrison (2008) established that national culture significantly influenced corporate governance structure and they showed that corporate governance structures differ significantly between countries arising from differences in national culture. Their study had compared differences in corporate governance structures in Australia, Japan, and countries in Western Europe and North America. Oliveira et al. (2016) found that national laws and corporate governance codes affected corporate governance practices and attributes.

2.3 State Ownership and Firm Financial Performance

Attia et al. (2018) studied the association between state ownership and firm profitability measured by ROTA and ROE in Tunisian listed firms and reported that there was a non-significant association

between state ownership and firm profitability. In particular, state-ownership affected positively, but not significantly, firm financial performance when state ownership was comparatively small, and adversely in the case of dominant state ownership. Setiawan et al. (2016), Utama et al. (2017) and Udin et al. (2017) found a positive but not significant relationship between State ownership and firm financial performance, while Aljifri and Moustafa (2007) showed a positive and significant relationship. However, Kabir and Thai (2017) found no relationship between the two while Shan and Xu (2012) found a negative relationship. Yang et al. (2012) who examined empirically whether state ownership affected income-smoothing behaviour in China, reported that when the state is the majority shareholder of the listed firm, income smoothing was severely affected (Yang et al., 2012). The state ownership and its effect on firm financial performance is inconclusive based on these studies. In the case of Zambia, there has been no study on the comparison between SOEs and private firms' corporate governance practices and firm financial performance.

2.4 Board Size and Firm Financial Performance

Board size is a vital attribute in corporate governance as the shareholders in appointing board members will appoint a certain number of members giving rise to a board size or the enabling legislation will stipulate the board size. Recent studies that have investigated the connection between board size and firm financial performance have provided varied results. Some studies have established a positive relationship, whilst others have found a negative relationship and yet others have found no relationship at all using different measures of financial performance.

Adeabah et al. (2019) found a positive influence of board size on firm efficiency in Ghana. Similarly, Gaur et al. (2015) found that, in New Zealand firms, board size positively affected ROTA, ROE and ROS. This was also the case in Shan and Xu (2012) results that revealed a positive association between board size and the level of bad debts provisioning in Chinese firms. Yasser et al. (2017) also found a positive association between Tobin's Q, ROTA and Earnings Value Added (EVA) in Pakistani firms whilst Sheikh and Wang (2012) revealed a positive effect of the size of the board on the long term gearing as measured by long term debt ratio and total debt ratio in Pakistani firms.

Shawtari et al. (2017), using discretionary accruals as a measure of firm financial performance, established a positive association in Malaysian companies while Kim et al. (2007) using operating efficiency ratio (fixed operating costs divided by income) established a positive relationship in American private club industry firms. McIntyre et al. (2007) also found a positive correlation between board size and financial performance measured by ROTA in Canadian firms. In addition, Mori and Towo (2017) revealed that firms with large boards were associated with high profitability measured by ROTA in Tanzanian firms while Muller-Kahle et al. (2014) found distinct difference between UK and USA firms in that in UK, the study found a positive significant impact between board size and ROTA whilst in USA firms the association was positive but not significant. Moreover, Constantatos (2019) found that ROTA and Tobin's Q were positively affected by board size in Greek firms during the financial crisis and thereafter. Also, Orozco et al. (2018) found that in Merco and Columbia large

boards are associated with high performance. This too was the case in Kiranmai and Mistra's (2019) study that found a positive relationship in Indian firms when financial performance was measured by ROTA, Tobin's Q, ROE. The same was the case in Merendino and Melville's (2019) findings that established that the size of the board had a positive influence on ROTA for subordinate levels of board size in Italian firms.

Studies that have found a positive and significant effect of board size on firm financial performance included Bokpin (2011) and Elmagrhi et al. (2017) using dividend payment in Ghana, Kenya and UK, respectively, Chen et al. (2017) in Chinese firms using investment efficiency, Bokpin et al. (2011) using liquidity in Ghana, Abor (2007) using gearing in Ghana, Kabir and Thai (2017) in Vietnamese firms using ROE, ROTA and Tobin's Q, Shettima and Dzolkarnaini (2018) using ROTA and ROE in Nigeria, Afrifa and Tauringana (2015) in UK SMEs in UK, and Nas and Kalaycioglu (2016) using export earnings in Turkey.

Studies that have found a negative impact of board size on firm financial performance included Wijethilake et al. (2015) using EPS in Sri Lanka, Nyamongo and Temesgen (2013) using Tobin's Q and ROTA in UK listed firms, Haider and Fang (2016) in China using operational risk, Al-Saidi, and Al-Shammari (2013) in Kuwait using ROTA and Tobin's Q, Palaniappan (2017) in India using Tobin's Q and ROTA.

In a number of studies, board size was found to have no effect on firm financial performance. These studies included Dato et al. (2018) in Ghanaian firms, Kao et al. (2019) in Taiwanese firms, Aljifri and Moustafa (2007) in UAE firms and Saidat and Seaman (2019) in Jordanian firms using ROE, Tobin's Q and ROTA.

2.5 Gender Diversity and Firm Financial Performance

Board diversity such as gender diversity as measured by the presence of females on boards showed a positive effect on firm financial performance as measured by Tobin's Q (Nerantzidis & Tsamis, 2017) in listed companies in Greece suggesting that the reason for this was because firms disclosed female participation so as to be socially and legitimately acceptable. Furthermore, Mori and Towo (2017) found that boards with females on them were related with high financial performance in Tanzanian firms because female board members contributed to the diversity of board composition and in particular with reference to knowledge on the local environment. In respect of SOEs, Usman et al. (2018 and 2019) established that gender-diverse boards have a lower cost of debt, reduce information asymmetry between management and shareholders, limit excessive compensations for the CEOs and management. Thrikawala et al. (2016) using ROTA in Pakistani firms found that gender diversity had a negative and significant effect on firm performance arguing that female contribution in the board room was affected by domestic and cultural factors.

2.6 Non-Executive Directors and Firm Financial Performance

Board composition measured by the number of non-executive members on the board was found to be significant and positive in a number of studies. These included Egbunike and Odum (2018) in Nigeria

using earnings management as a measure of firm financial performance; Abor and Fiador (2013) in Sub-Saharan Africa using dividend payment; Abor (2007) in Ghana using gearing; and Dato et al. (2018) in Ethiopia using ROTA and social efficiency.

Al-Saidi and Al-Shammari (2013) and Nas and Kalaycioglu (2016) revealed a positive influence on firm financial performance measured by ROTA and solvency, ROTA and Tobin's Q, export performance in a sample of international firms from across the globe, Kuwait and Turkey, respectively. Sheikh and Wang (2012) revealed a positive relationship with leverage in Pakistani listed firms. Afrifa and Tauringana (2015) reported no effect on Tobin's Q in UK SMEs that were listed on the London Stock Exchange arguing that the effect of corporate governance factors on firm performance differs between different types of firms. However, Bokpin et al. (2011) found a significant and negative effect using liquidity in Ghana and Thrikawala et al. (2016) using ROTA in Pakistani found inconclusive results whilst Abdelsalam et al. (2008) found no effect in Egyptian firms using dividend payment.

2.7 SOEs Compared to Privately Owned Firms

Bozec and Breton (2003) investigated whether financial performance in SOEs in Canada improved when the SOEs were corporatized. The results were that when SOEs are corporatized the financial performance of SOEs improved significantly. This suggested that the main difference in the improved financial performance was as a result of the varying objectives of the firm and not the property or some political activities.

In a systematic and structured review of international literature, Gakhar and Phukon (2018) found major and significant improvements in firm financial performance in the post-privatisation period for SOEs that were privatised. A study by Hassoun and Aloui (2017) established that, to improve ROTA, ROE and ROS, in Middle Eastern and North African (MENA) countries, government ownership and the proportion of NEDs could be a substitute for auditors from the Big Four audit firms and CEO duality and foreign ownership re-enforced each other in improving firm financial performance in privatised SOEs. Hassoun and Aloui (2017)'s study focused on the interactional effects of internal corporate governance factors and their effect on firm financial performance.

2.8 Firm Financial Performance Measures

According to Hansen and Wernefelt (1989) firm financial performance is affected by factors grouped into (1) organisational, (2) environmental and (3) people factors. Firm financial performance measures may be categorised in several other ways such as the use of objective, financial and non-financial, subjective, short term and long term measures.

ROTA is one of the most frequently used measure of firm financial performance (Williams, 2018). From the literature survey conducted in this study the findings were that ROTA was the most frequently used firm financial performance measure (27%) as shown in Table 1. This was followed by Tobin's Q at 19% and ROE at 11%.

Table 1. Firm Financial Performance Measures Employed

Firm financial performance Measure	Number	%
Return on Total Assets (ROTA)	29	27
Tobins Q/Firm Value	20	19
Return on Equity (ROE)	12	11
Dividend pay-out	5	5
Return on Sales(ROS)	4	4
Earnings per Share(EPS)	4	4
Economic Value Added(EVA)	3	3
Net Profit Margin	3	3
Total Debt to Total Capital(leverage)	3	3
Market to book value	3	3
Operating Efficiency	2	2
Corporate Cash/Liquidity	2	2
Stock Return	2	2
Sales Efficiency	1	1
Net income efficiency	1	1
Cost of capital	1	1
Investment Efficiency	1	1
Earnings Management	1	1
Social efficiency	1	1
Loan size	1	1
Bank Efficiency	1	1
Growth	1	1
Long Term Debt Ratio	1	1
Total Debt Ratio	1	1
Export Perf.	1	1
ROIC	1	1
Altman Z-Score	1	1
TOTAL	106	100

Source: Authors, 2022.

In this study, ROTA was used to measure firm financial performance in assessing the effect of corporate governance factors on firm financial performance as it has been the most frequently used measure of firm financial performance as shown in Table 1.

2.9 Research Methodology

Based on the research papers reviewed in this study, the most popular methodology used in investigating the association between corporate governance attributes and firm financial performance

was quantitative (81%), followed by Qualitative (10) and mixed methods (combining quantitative and qualitative). The research methodology adopted in this study was the Quantitative methodology which followed what the majority of other studies have used.

2.10 Corporate Governance Theories

An integrative and multi-prolonged theoretical approach has been adopted in this study in order to better understand corporate governance practices and in SOEs and listed firms in Zambia. The main theoretical perspectives that have underpinned and guided the study accordingly include agency, stakeholder, political economic and institutional theories. This approach is in line with that followed by Nerantzidis and Tsamis (2017). As regards the choice of theories in respect of firm financial performance, ROTA as an objective measure of performance has been adopted.

2.11 Research Objective

The overall research objective was:

- i. To compare the corporate governance practices and firm financial performances between unlisted SOEs, listed SOEs and private listed firms in Zambia.

Hypotheses on Corporate Governance practices:

Null Hypothesis (H_0)

There is no difference in the corporate governance practices (BSIZ, PNED, PFEM) of unlisted SOEs, listed SOEs and listed private firms in Zambia.

Alternate Hypothesis (H_1)

There are differences in the corporate governance practices (BSIZ, PNED, PFEM) of unlisted SOEs, listed SOEs and listed private firms in Zambia.

Hypotheses on financial performances:

Null Hypothesis (H_0)

There is no difference in the firm financial performance (ROTA) of unlisted SOEs, listed SOEs and listed private firms in Zambia.

Alternate Hypothesis (H_1)

There are differences in the firm financial performance (ROTA) of unlisted SOEs, listed SOEs and listed private firms in Zambia.

2.12 Definition of Key Terms

The operational terms employed in the study were as follows:

Board Size (BSIZ) is the number of board members.

Proportion of Non-Executive Directors on the Board (PNED) is number of non-executive directors on the board divided by the size of the board.

Gender diversity (PFEM) was measured as the percentage of females on the board of directors (Drakos and Bekiris, 2016). This was measured by dividing the number of female board members by the size of the board.

Return on Total Assets (ROTA) was defined as the ratio of profit before tax divided by the total assets (Attia et al. (2018).

State-Owned Enterprise (SOE) or Parastatal was defined as a legal entity carrying on commercial activities on behalf of the government (Armitage, 2014).

Unlisted State-Owned Enterprise (SOE) was defined as an SOE not listed on the Lusaka Securities Exchange

Listed State-Owned Enterprise (SOE) was defined as an SOE listed on the Lusaka Securities Exchange

Listed Private firm was defined as a non-SOE firm listed on the Lusaka Securities Exchange

3. Research Methodology

3.1 Methodology

The study was based on the positivist paradigm using a quantitative methodology as adopted in most studies on corporate governance and firm performance. The collection of data involved documentary analysis of financial statements as well as audit reports to render information on corporate governance practices and financial performance of the firms. The research study employed a longitudinal research perspective related to the collection of panel data covering the period 2002 to 2017.

3.2 Sampling Frame

The sampling frame comprised all the SOEs in Zambia that were in existence during the period 2002 to 2017 including those that were not under the Industrial Development Corporation (IDC). According to IDC (2015), there were 33 SOEs in Zambia under the IDC. For listed companies all the 23 companies were included. There were two SOEs that were listed. The data set being considered was a panel data comprising a time dimension (2002 to 2017) and a cross-sectional (firm dimension). The design was chosen as the population was small. The use of panel data thus allowed meaningful statistical analysis from the increased number of observations. There were gaps in the panel data as not all the institutions panel data were available for the years 2002 to 2017 and consequently, in the analysis the number of observations varied depending on the panel data availability.

3.3 Data Analysis

The data that were generated were analysed using STATA v 13.0 and specifically the t-tests for analysis of variances.

3.4 Reliability and Validity

A pilot study was undertaken to ensure validity and reliability of the research instruments and data analysis methods. The pilot study was carried out by issuing the data collection instruments to two experts in corporate governance and corporate finance who completed the evaluated the data collection instruments to ensure reliability and validity of the instruments. Their observations were then incorporated in the data collection instruments.

3.5 Detailed Hypotheses

For corporate governance practices:

The Alternative Hypotheses that were tested were as follows:

H1

There is a difference in the BSIZ of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H2

There is a difference in the BSIZ of unlisted SOEs as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H3

There is a difference in the BSIZ of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H4

There is a difference in the PNED of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H5

There is a difference in the PNED of unlisted SOEs as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H6

There is a difference in the PNED of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H7

There is a difference in the PFEM of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H8

There is a difference in the PFEM of unlisted SOEs as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H9

There is a difference in the PFEM of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

For firm performances:

The Alternative Hypotheses that were tested were as follows:

H10

There is a difference in the ROTA of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H11

There is a difference in the ROTA of unlisted SOEs as compared to listed SOEs on the Lusaka

Securities Exchange (LuSE).

H12

There is a difference in the ROTA of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H13

There is a difference in the ROTA of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H14

There is a difference in the ROTA of unlisted SOEs as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H15

There is a difference in the ROTA of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H16

There is a difference in the ROTA of unlisted SOEs as compared to listed private companies on the Lusaka Securities Exchange (LuSE).

H17

There is a difference in the ROTA of unlisted SOEs as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

H18

There is a difference in the ROTA of listed private companies as compared to listed SOEs on the Lusaka Securities Exchange (LuSE).

3.6 Statistical Techniques and Analysis

A systematic approach was followed firstly using the **Levene's Test** for homogeneity of variances using the `robvar` command in STATA, secondly the One-Way and Two-Way **ANOVA** for equality of variances and finally the **t-test** for equal variances using the T-test using the Welch Approximation. The two-sample t-test assuming unequal variances was the statistic used to test the hypotheses. The t-value measured the size of the differences in BSIZ, PNED, PFEM and ROTA.

4. Research Findings

4.1 Description of the Observed Panel Data

The mean of the observed panel data for BSIZ, PNED, PFEM and ROTA were 8.90; 0.87; 0.21 and 0.00 respectively. The segregated means for ROTA were 0.14 for listed private firms, -0.08 for unlisted SOEs and 0.02 for listed SOEs. The standard deviations were 3.03 for BSIZ, 0.18 for PNED, 0.12 for PFEM and 0.27 for ROTA. The skewness of the observed panel data was found to be 1.08 for BSIZ, -1.86 for PNED, 0.23 for PFEM and -1.32 for ROTA. The Kurtosis was 1.27 for BSIZ, 4.55 for PNED, -0.02 for PFEM and 11.97 for ROTA.

4.2 Test for Homogeneity of Variances

4.2.1 Using the Levene's Test for Homogeneity of Variances

The Levene's Test was used to determine whether two or more groups have equal variances. The data were grouped into three groups namely unlisted SOEs, Listed SOEs and Listed non-SOEs.

Categorisation of firms:

- ListedPrivat – means private firms listed on the Lusaka Securities Exchange(LUSE)
- UnlistedSOE – means unlisted SOEs
- ListedSOE – means SOEs that were listed

Robust tests for equality of variances using the robvar command in STATA

Corporate Governance practices

Board Size.

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.robvar BSIZ, by (Type)
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Summary of BSIZ

Table 2. Robust Tests for Equality of Variances of BSIZ

Type	Mean	Std. Dev.	Freq.
Listed	8.078661	2,6938528	127
Unlisted SOE	9.61	3.1476082	200
Listed SOE	6.8888889	.83235236	18
Total	8.9014493	3.0303013	345
W0= 6.7239590	Df (2, 342)	Pr > F =	0.00136701
W50=5.8754381	Df (2, 342)	Pr > F =	0.00309876
W10=6.3278562	Df (2, 342)	Pr > F =	0.00200205

Source: Authors, 2022

W0: 6.7239590. This is the test statistic for Levene's Test centred on the mean. The corresponding p-value is **0.00136701**.

W50: 5.8754381. This is the test statistic for Levene's Test centred on the median. The corresponding p-value is **0.00309876**.

W10: 6.3278562. This is the test statistic for Levene's Test centred using the 10% trimmed mean – i.e., the top 5% and bottom 5% of values are trimmed out so they don't overly influence the test. The corresponding p-value is **0.00200205**.

No matter which version of Levene's Test was used, the p-value for each version is less than 0.05. This indicates that there is a statistically significant difference in the variance of BSIZ between LUSE, SOE and SOE & Listed companies and the assumption of homogeneity of variances is violated. Table 2 contains the results.

Non-Executive Directors

.robvar PNED, by (Type)

Summary of PNED

Table 3. Robust Tests for Equality of Variances of PNED

Type	Mean	Std. Dev.	Freq.
Listed	.2820604	.36183822	94
Unlisted SOE	.92923932	.18411465	200
Listed SOE	.936662465	.07001773	17
Total	.73403267	.38738774	311
W0= 53.690544	Df (2, 342)	Pr > F =	0.00000000
W50=23.871764	Df (2, 342)	Pr > F =	0.00000000
W10=55.830607	Df (2, 342)	Pr > F =	0.00000000

Source: Author, 2022

W0: 53.690544. This is the test statistic for Levene's Test centred at the mean. The corresponding p-value is **0.000000**.

W50: 23.871764. This is the test statistic for Levene's Test centred at the median. The corresponding p-value is **0.000000**

W10: 55.830607. This is the test statistic for Levene's Test centred using the 10% trimmed mean – i.e., the top 5% and bottom 5% of values are trimmed out so they don't overly influence the test. The corresponding p-value is **0.000000**.

No matter which version of Levene's Test was used, the p-value for each version is less than 0.05. This indicates that there is a statistically significant difference in the variance of PNED between LUSE, SOE and SOE&Listed companies and the assumption of homogeneity of variances is violated. Table 3 contains the results.

Female representation on the Board of Directors

.robvar PFEM, by (Type)

Summary of PFEM

Table 4. Robust Tests for Equality of Variances of PFEM

Type	Mean	Std. Dev.	Freq.
Listed	.2018093	.13232494	127
Unlisted SOE	.16839411	.09298899	26
Listed SOE	.27546296	.03821571	18
Total			

W0= 10.0569760	Df (2, 342)	Pr > F =	0.00007492
W50=8.2026131	Df (2, 342)	Pr > F =	0.00039905
W10=8.5474687	Df (2, 342)	Pr > F =	0.00029163

Source: Authors, 2022

W0: 10.0569760. This is the test statistic for Levene's Test centred at the mean. The corresponding p-value is **0.00007492**.

W50: 8.2026131. This is the test statistic for Levene's Test centred at the median. The corresponding p-value is **0.0003905**.

W10: 8.5474687. This is the test statistic for Levene's Test centred using the 10% trimmed mean – i.e., the top 5% and bottom 5% of values are trimmed out so they don't overly influence the test. The corresponding p-value is **0.00029163**.

No matter which version of Levene's Test was used, the p-value for each version is less than 0.05. This indicates that there is a statistically significant difference in the variance of PNEED between LUSE, SOE and SOE & Listed companies and the assumption of homogeneity of variances is violated. Table 4 contains the results.

Firm financial performances

ROTA

.robvar ROTA, by (Type)

Summary of ROTA

Table 5. Robust Tests for Equality of Variances of ROTA

Category	Mean	Std. Dev.	Freq.
Listed	.15857877	.216613	111
Unlisted SOE	.03389325	.0728716	15
Listed SOE	-.01676752	0	1
Total			
W0= 1.3360504	Df (2, 342)	Pr > F =	0.26663928
W50=1.1485340	Df (2, 342)	Pr > F =	0.32045115
W10=1.0443215	Df (2, 342)	Pr > F =	0.35500487

Source: Authors, 2022

W0: 1.3360504. This is the test statistic for Levene's Test centred at the mean. The corresponding p-value is **0.26663928**.

W50: 1.1485340. This is the test statistic for Levene's Test centred at the median. The corresponding p-value is **0.32045115**.

W10: 1.0443215. This is the test statistic for Levene's Test centred using the 10% trimmed mean – i.e., the top 5% and bottom 5% of values are trimmed out so they don't overly influence the test. The corresponding p-value is **0.35500487**.

No matter which version of Levene's Test is used, the p-value for each version is not less than 0.05. This indicates that there is no statistically significant difference in the variance of ROTA between LUSE, SOE and SOE & Listed companies and the assumption of homogeneity of variances is not violated. Table 5 contains the results.

4.2.2 Using the t-test for Homogeneity of Variances

A one-way ANOVA test was used to determine whether two or more groups have equal variances. The data was grouped into three groups namely unlisted SOEs, Listed SOEs and Listed non-SOEs. Table 6 contains the results.

Table 6. One-Way ANOVA for Equality of Variances

Variable	SS	DF	MS	F statistic	Prob>F	Chi2(2)	Prob > Chi2
BSIZ	260.9293	2	130.4646	15.40	0.0000	30.6079	0.000
ROTA	0.2310	2	0.1155	2.74	0.0688	17.0107	0.000
PNED	27.5211	2	13.7605	223.06	0.0000	88.5773	0.000
PFEM	0.1255	2	0.0627	4.31	0.0150	28.4754	0.000

Source: Authors, 2022

For BSIZ the significant level is 0.000 which is below the 0.05 and therefore there is a statistically significant difference in the mean of BSIZ between the three groups. For ROTA the significant level is 0.0688 which is above the 0.05 and therefore there is no statistically significant difference in the mean of ROTA between the three groups. For PNED the significant level is 0.000 which is below the 0.05 and therefore there is a statistically significant difference in the mean of PNED between the three groups. For PFEM the significant level is 0.0150 which is below the 0.05 and therefore there is a statistically significant difference in the mean of PFEM between the three groups. From a theoretical perspective the corporate governance practices in SOEs is explained by the stakeholder perspective which for example requires larger boards with large representation by stakeholders.

Pairwise ANOVA

A pairwise one-way ANOVA test was used to determine whether two paired groups have equal variances. The data was grouped into three groups namely unlisted SOEs (categorized as SOEs), Listed SOEs (categorized as SOEs & Listed) and Listed non-SOEs (categorized as LUSE). Table 2 contains the results.

Table 7. Pairwise ANOVA

Variable	Category	LUSE	SOE
BSIZ	SOE	1.53913	
		0.000	
	SOE&LISTED	-1.18198	-2.72111
		0.323	0.001
PNED	SOE	0.28	
		0.000	
	SOE&LISTED	0.20	-0.08
		0.000	0.019
PFEM	SOE	0.068593	
		0.027	
	SOE&LISTED	-0.023107	-0.0909
		1.000	0.046
ROTA	SOE	-0.23	
		0.000	
	SOE&LISTED	-0.12	0.11
		0.169	0.259

Source: Authors, 2022

For BSIZ the significant level is 0.0000 which is below the 0.05 and therefore there is a statistically significant difference in the mean of BSIZ between SOEs and LUSE companies. With a significant level of 0.001 which is below the 0.05 therefore there is a statistically significant difference in the mean of BSIZ between the SOE& Listed companies and SOEs companies. With a significant level of 0.323 which is above the 0.05 therefore there is no statistically significant difference in the mean of BSIZ between the SOE& Listed companies and LUSE companies.

For PNED the significant level is 0.000 which is below the 0.05 and therefore there is a statistically significant difference in the mean of PNED between SOEs and LUSE companies. With a significant level of 0.019 which is below the 0.05 therefore there is a statistically significant difference in the mean of PNED between the SOE& Listed companies and SOEs companies. With a significant level of 0.000 which is below the 0.05 therefore there is a statistically significant difference in the mean of PNED between the SOE& Listed companies and LUSE companies.

For PFEM the significant level is 0.027 which is below the 0.05 and therefore there is a statistically significant difference in the mean of PFEM between SOEs and LUSE companies. With a significant level of 0.046 which is below the 0.05 therefore there is a statistically significant difference in the mean of PFEM between the SOE& Listed companies and SOEs companies. With a significant level of 1.000 which is above the 0.05 therefore there is no statistically significant difference in the mean of PFEM

between the SOE& Listed companies and LUSE companies.

For ROTA the significant level is 0.000 which is below the 0.05 and therefore there is a statistically significant difference in the mean of ROTA between SOEs and LUSE companies. With a significant level of 0.259 which is above the 0.05 therefore there is no statistically significant difference in the mean of ROTA between the SOE& Listed companies and SOEs companies. With a significant level of 0.169 which is above the 0.05 therefore there is no statistically significant difference in the mean of ROTA between the SOE and Listed companies and LUSE companies.

4.2.3 Test for Equal Variances Using the T-test Using the Welch Approximation

Using the t-test, the equality of the variances for BSIZ, PNED, PFEM and ROTA between the three categories was compared.

Board size

Table 8 contains the results for BSIZ comparing listed firms against unlisted SOEs.

.ttest BSIZ_ListedPrivate==BSIZ_unlistedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 8. t-test for BSIZ

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
BSIZ_ListedPrivate	127	8.070866	.2390408	2.693853	7.597811 8.543921
BSIZ_unlistedSOE	200	9.61	.2225695	3.147608	9.171103 10.0489
Combined	327	9.012232	.1697005	3.068718	8.678386 9.346079
diff		-1.539134	.3266155		-2.181884 -.8963839

diff = mean (BSIZ_ListedPrivate - BSIZ_unlistedSOE) t = -4.7124

Ho: diff = 0 Welch's degrees of freedom = 299.726

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr (T<t) = 0.0000

Pr (|T|<|t|) = 0.0000

Pr (T>t) = 1.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for BSIZ for LUSE data is not equal to underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for LUSE data was less than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the BSIZ for LUSE is statistically significantly less than the mean for the SOE companies.

For LUSE data the mean BSIZ was 8.07 compared 9.61 for SOE data.

Table 9 contains the results for BSIZ comparing listed firms against listed SOEs

.ttest BSIZ_ListedPrivate==BSIZ_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 9. t-test for BSIZ

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
BSIZ_ListedPrivate	127	8.070866	.2390408	2.693853	7.597811 8.543921
BSIZ_ListedSOE	18	6.888889	.1961873	.8323524	6.47497 7.302808
Combined	145	7.924138	.2130968	2.566025	7.502936 8.34534
diff		1.181977	.3092409		.5672648 1.79669

diff = mean (BSIZ_ListedPrivate - BSIZ_listedSOE) $t = 3.8222$

Ho: diff = 0 Welch's degrees of freedom = 86.3766

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr (T<t) = 0.9999

Pr (|T|<|t|) = 0.0002

Pr (T>t) = 0..0001

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for BSIZ for LUSE data is not equal to underlying mean of listed SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for LUSE data is greater than the underlying mean of listed SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the BSIZ for LUSE is statistically significantly greater than the mean for the BSIZ for listed SOE companies. For LUSE data the mean BSIZ was 8.07 compared 6.8889 for listed SOE data.

Table 10 contains the results for BSIZ comparing unlisted SOEs against listed SOEs.

.ttest BSIZ_unlistedSOE==BSIZ_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 10. t-test Results for BSIZ Comparing Unlisted SOEs against Listed SOEs

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
BSIZ_unlistedSOE	200	9.61	.2225692	3.171103	9.171103 10.0489
BSIZ_listedSOE	18	6.888889	.1961873	.8323524	6.47497 7.302808
Combined	218	9.385321	.2109761	3.115025	8.969496 9.801146
diff		2,7211111	.2966929		2.131097 3.311125

diff = mean (BSIZ_unlistedSOE - BSIZ_listedSOE) $t = 9.1715$

Ho: diff = 0 Welch's degrees of freedom = 83.9256

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr (T<t) = 1.0000

Pr (|T|<|t|) = 0.0000

Pr (T>t) = 0.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for BSIZ for listed SOE data is not equal to underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for SOE data is greater than the underlying mean of

listed SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the BSIZ for SOEs is statistically significantly greater than the mean for the BSIZ for listed SOE companies. For SOE data the mean BSIZ was 9.61 compared 6.8889 for SOE data.

PNED

Table 11 contains the results for PNED comparing listed private firms against unlisted SOEs.

.ttest PNED_ListedPrivate==PNED_unlistedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 11. t-test for PNED

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf.	Interval)
PNED_ListedPrivate	127	.6966453	.0167823	.1891264	.6634337	.7298569
PNED_ListedSOE	200	.9763901	.0040212	.056868	.9684605	.9843197
Combined	327	.867743	.0102634	.1855941	.84755617	.8879338
diff		-.2797448	0.0172573		-.3138617	-.245628

diff = mean (PNED_ListedPrivate - PNED_ListedSOE) t = -16.2102

Ho: diff = 0 Welch's degrees of freedom = 140.82

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0

Pr (T<t) = 0.0000

Pr (|T|<|t|) = 0.0000

Pr (T>t) = 1.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PNED for LUSE data is not equal to underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. Further, the underlying mean for LUSE data is less than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the PNED for LUSE is statistically significantly less than the mean for the PNED for SOE companies. For LUSE data the mean PNED was 0.6966 compared 0.97639 for SOE data.

Table 12 contains the results for PNED comparing listed private firms against listed SOEs.

.ttest PNED_ListedPrivate==PNED_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 12. t-test for PNED

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf.	Interval)
PNED_ListedPrivate	127	.6966453	.0167823	.1891264	.6634337	.7298569
PNED_unlistedSOE	18	.8926367	.0166088	.0704653	.8575951	.9276783
Combined	145	.7209752	.0157763	.1899721	.6897921	.7521583
diff		-.1959914	.0236114		-.2431438	-.148839

diff = mean (PNED_ListedPrivate - PNED_unlistedSOE) $t = -8.3007$
 Ho: diff = 0 Welch's degrees of freedom = 65.2048
 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr (T<t) = 0.0000 Pr (|T|<|t|) = 0.0000 Pr (T>t) = 1.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PNED for LUSE data is not equal to underlying mean of listed SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for LUSE data is less than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the PNED for LUSE is statistically significantly less than the mean for the PNED for SOE companies.

For LUSE data the mean PNED was 0.6966 compared 0.8926 for SOE data.

Table 13 contains the results for PNED comparing unlisted SOEs against listed SOEs

.ttest PNED_unlistedSOE==PNED_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 13. t-test for PNED

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
PNED_unlistedSOE	200	.9763901	.0040212	.056686	.9684605 .9843197
PNED_listedSOE	18	.8926367	.0166088	.0704653	.8575951 .9276783
Combined	218	.9694747	.0042234	.062358	.9611505 .9777989
diff		.0837534	.0170887		.0480222 .1194846

diff = mean (PNED_unlistedSOE - PNED_listedSOE) $t = 4.9011$

Ho: diff = 0 Welch's degrees of freedom = 19.2858
 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr (T<t) = 1.0000 Pr (|T|<|t|) = 0.0000 Pr (T>t) = 0.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PNED for listed SOE LUSE data is not equal to underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for listed SOES data is greater than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the PNED for listed SOEs is statistically significantly less than the mean for the PNED for SOE companies. The mean PNED was 0.9764 for SOEs and 0.8926 for listed SOEs.

PFEM

Table 14 contains the results for PFEM comparing listed private firms against unlisted SOEs.

.ttest PFEM_ListedPrivate==PFEM_unlistedSOE, unpaired, unequal welch
Two-sample t test with unequal variances

Table 14. t-test for PFEM

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
PFEM_ListedPrivate	127	.1963793	.0117674	.1326117	.173092 .2196666
PFEM_unlistedSOE	44	.227868	.0130959	.0868687	.2014575 .2542785
Combined	171	.2044816	.0094075	.1230185	.1859112 .2230521
diff		-.0314887	.0176061		-.0663548 .0033775

diff = mean (PFEM_ListedPrivate - PFEM_unlistedSOE) t = -1.7885
Ho: diff = 0 Welch's degrees of freedom = 117.592
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr (T<t) = 0.0381 Pr (|T|<|t|) = 0.0763 Pr (T>t) = 0.9619

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PFEM for LUSE data is not equal to underlying mean of SOE data ($p=0.0763$). Further the underlying mean for LUSE data is less than the underlying mean of SOE data with a significance level of 0.0763. We conclude that the mean of the PFEM for LUSE is statistically significantly less than the mean for the PFEM for SOE companies.

For LUSE data the mean PFEM was 0.1963 compared 0.22786 for SOE data.

Table 15 contains the results for PFEM comparing listed private firms against listed SOEs.

.ttest PFEM_ListedPrivate==PFEM_listedSOE, unpaired, unequal welch
Two-sample t test with unequal variances

Table 15. t-test for PFEM

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
PFEM_ListedPrivate	127	.1963793	.0117674	.1326117	.173092 .2196666
PFEM_listedSOE	18	.1742725	.021063	.0893628	.1298334 .2187116
Combined	145	.193635	.0106298	.1279996	.1726244 .2146456
diff		.0221068	.0241272		-.0271508 .0713644

diff = mean (PFEM_ListedPrivate - PFEM_listedSOE) t = 0.9161
Ho: diff = 0 Welch's degrees of freedom = 30.2451
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr (T<t) = 0.8166 Pr (|T|<|t|) = 0.3668 Pr (T>t) = 0.1834

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PFEM for LUSE data is not unequal to underlying mean of listed SOE data with a significance level of 0.3688 at 95% confidence level.

Table 16 contains the results for PFEM comparing unlisted SOEs against listed SOEs.

.ttest PFEM_unlistedSOE==PFEM_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 16. t-test for PFEM

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
PFEM_unlistedSOE	44	.227868	.0130959	.0868687	.2014575 .2542785
PFEM_listedSOE	18	.1742725	.021063	.0893628	.1298334 .2187116
Combined	62	.212308	.0114628	.0902579	.1893868 .2352292
diff		.0535955	.0248023		.0030969 .104094
diff = mean (PFEM_unlistedSOE - PFEM_listedSOE)					t = 2.1609
Ho: diff = 0		Welch's degrees of freedom = 32.3611			
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0	
Pr (T<t) = 0.9809		Pr (T < t) = 0.0383		Pr (T>t) = 0.0191	

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for PFEM for listed SOE data is not equal to underlying mean of SOE data with a significance level of 0.0382 at 95% confidence level. We conclude that the mean of the PFEM for SOE is statistically significantly greater than the mean for the PFEM for listed SOE companies.

ROTA

Table 17 contains the results comparing listed private firms against unlisted SOEs.

.ttest ROTA_ListedPrivate==ROTA_unlistedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 17. t-test for ROTA

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
ROTA_ListedPrivate	127	.1424715	.0184831	.2082927	.105894 .1790489
ROTA_unlistedSOE	200	-.0847482	.0200207	.283136	-.1242282 -.0452681
Combined	327	.0034992	.0154451	.2792959	-.0268854 .0338839
diff		.2272196	.027248		.1736118 .2808274
diff = mean (ROTA_ListedPrivate - ROTA_unlistedSOE)					t = 8.3389
Ho: diff = 0		Welch's degrees of freedom = 320.154			

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr (T<t) = 1.0000 Pr (|T|<|t|) = 0.0000 Pr (T>t) = 0.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for ROTA for LUSE data is not equal to underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for LUSE data is greater than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the ROTA for LUSE is statistically significantly greater than the mean for the ROTA for SOE companies.

For LUSE data for private firms the mean ROTA was 14.25% compared a negative 8.5% for SOE data meaning that LUSE companies are more efficient in that they provide a better ROTA as compared to SOEs

Table 18 contains the results for the t-test for ROTA for listed private firms compared to listed SOEs.

.ttest ROTA_ListedPrivate==ROTA_lstedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 18. t-test for ROTA

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf.	Interval)
ROTA_ListedPrivate	127	.1424715	.0184831	.2082937	.105894	.1790489
ROTA_listedSOE	18	.0214898	.0187483	.0795423	-.0180656	.0610453
Combined	145	.127453	.0166738	.2007794	.094496	.1604101
diff		.1209816	.0263272		.0683675	.1735958

diff = mean (ROTA_ListedPrivate - ROTA_listedSOE) t = 4.5953

Ho: diff = 0 Welch's degrees of freedom = 62.7947

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr (T<t) = 1.0000 Pr (|T|<|t|) = 0.0000 Pr (T>t) = 1.0000

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for ROTA for LUSE data is not equal to underlying mean of listed SOEs data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for LUSE data is greater than the underlying mean of listed SOEs data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the ROTA for LUSE is statistically significantly greater than the mean for the ROTA for listed SOE companies.

For LUSE data for private firms the mean ROTA was 14.25% compared 2.15% for listed SOE data meaning that LUSE companies are more efficient in that they provide a better ROTA as compared to

listed SOEs.

Table 19 contains the results for ROTA for unlisted SOEs compared to listed SOEs.

.ttest ROTA_unlistedSOE==ROTA_listedSOE, unpaired, unequal welch

Two-sample t test with unequal variances

Table 19. t-test for ROTA for Unlisted SOEs Compared to Listed SOEs

Variable	Obs	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)
ROTA_unlistedSOE	200	-.0847482	.0200207	.283136	-.1242282 - .0452681
ROTA_listedSOE	18	.0214898	.0187483	.0795423	-.0180656 .0610453
Combined	218	-.0759762	.0185323	.2736254	-.1125025 -.03945
diff		-.106238	.0274286		-.1608725 -.0516035

diff = mean (ROTA_unlistedSOE - ROTA_listedSOE) $t = -3.8733$

Ho: diff = 0 Welch's degrees of freedom = 75.5124

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr (T<t) = 0.0001

Pr (|T|<|t|) = 0.0002

Pr (T>t) = 0.9999

Source: Authors, 2022

The test using the Welch approximation formula indicates that the underlying mean for ROTA for SOEs' data is not equal to underlying mean of listed SOEs data with a significance level of 0.00 at 95% confidence level. Further the underlying mean for listed SOE data is greater than the underlying mean of SOE data with a significance level of 0.00 at 95% confidence level. We conclude that the mean of the ROTA for listed SOEs is statistically significantly greater than the mean for the ROTA for SOE companies.

For listed SOEs data the mean ROTA was 2.15% compared to -8.45% for SOEs meaning that listed SOEs companies are more efficient in that they provide a better ROTA as compared to unlisted SOEs.

4.2.4 Effect Size Tests

The effect size test was conducted to quantify the difference between the paired categories emphasizing the size of the difference in the relationships between the measured variables.

H₀: The Null Hypothesis is that there no significant effect size in the measured variable between the categories. The effect size was considered significant if zero was not in the 95% confidence interval.

H_a: The Alternative Hypothesis is that there is significant effect size in the measured variable between the categories.

The **esize** function in STATA was employed to conduct the analysis as below.

Board Size

Table 20 to 22 contain the results for Effect size.

.esize unpaired BSIZ_ListedPrivate == BSIZ_unlistedSOE, cohensd hedgesg glassdelta pbcorr unequal

welch

Effect size based on mean comparison, unequal variance

Number of obs = 327

Table 20. Effect Size Test for BSIZ

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	-.5165047	-.7422804	-.289895
Hedges's g	-.5153117	-.7405659	-.2892254
Glass's Delta 1	-.5713504	-.8036	-.3370326
Glass's Delta 2	-.4889852	-.7159054	-.2608892
Point-Biserial r	-.2626376	-.3611266	-.1547988

Welch degrees of freedom = 299.7264

Source: Authors, 2022

.esize unpaired BSIZ_ListedPrivate == BSIZ_ListedSOE, cohensd hedgesg glassdelta pbcorr unequal

welch

Effect size based on mean comparison, unequal variance

Number of obs = 145

Table 21. Effect Size Test for BSIZ

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.4644498	-.0353102	.9615747
Hedges's g	.4620089	-.0351247	.9565211
Glass's Delta 1	.4387683	-.0586708	.9344877
Glass's Delta 2	1.420044	.7251451	3.093096
Point-Biserial r	.3803488	.1871907	.5328895

Welch degrees of freedom = 86.3766

Source: Authors, 2022

.esize unpaired BSIZ_unlistedSOE == BSIZ_listedSOE, cohensd hedgesg glassdelta pbcorr unequal

welch

Effect size based on mean comparison, unequal variance

Number of obs = 218

Table 22. Effect Size Test for BSIZ

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.8979923	.3933878	1.396529
Hedges's g	.8948701	.3931162	1.391673
Glass's Delta 1	.8645012	.3737264	1.353167
Glass's Delta 2	3.269182	2.070137	4.451721
Point-Biserial r	.7075072	.5933399	.7835515

Welch degrees of freedom = 83.9256

Source: Authors, 2022

For BSIZ as zero was in the 95% confidence interval it cannot be concluded that there is a significant effect size for LUSE vs SOE & Listed data. As for LUSE vs SOE and SOE vs SOE & Listed, as zero was not in the 95% confidence interval it can be concluded that there is significant effect size.

PFEM

Table 23 to 25 contain the results for Effect size.

```
.esize unpaired PFEM_ListedPrivate == PFEM_unlistedSOE, cohensd hedgesg glassdelta pbcorr
unequal welch
```

Effect size based on mean comparison, unequal variance

Number of obs = 171

Table 23. Effect Size Test for PFEM

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	-.2568354	-.6007199	.0881306
Hedges's g	-.2556936	-.5980494	.0877388
Glass's Delta 1	-.2374502	-.5810923	.1071268
Glass's Delta 2	-.3624859	-.7117469	-.0092136
Point-Biserial r	-.1627321	-.3274439	.0173767

Welch degrees of freedom = 117.5924

Source: Authors, 2022

```
.esize unpaired PFEM_ListedPrivate == PFEM_listedSOE, cohensd hedgesg glassdelta pbcorr unequal
welch
```

Effect size based on mean comparison, unequal variance

Number of obs = 145

Table 24. Effect Size Test for PFEM

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.1723911	-.3245307	.6664961
Hedges's g	.1714851	-.3228252	.6629933
Glass's Delta 1	.1667034	-.327676	.6604229
Glass's Delta 2	.2473826	-.256602	.7443414
Point-Biserial r	.164341	-.1900487	.4641969

Welch degrees of freedom = 30.2451

Source: Authors, 2022

.esize unpaired PFEM_unlistedSOE == PFEM_listedSOE, cohensd hedgesg glassdelta pbcorr unequal
welch

Effect size based on mean comparison, unequal variance

Number of obs = 62

Table 25. Effect Size Test for PFEM

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.6119424	.0394144	1.175675
Hedges's g	.6042557	.0389193	1.160907
Glass's Delta 1	.6169714	.0499972	1.177159
Glass's Delta 2	.5997513	.0082781	1.175745
Point-Biserial r	.3551041	.0204667	.591599

Welch degrees of freedom = 32.3611

Source: Authors, 2022

For PFEM as zero was in the 95% confidence interval it cannot be concluded that there is a significant effect size for LUSE compared to SOE and Listed data and LUSE compared to SOEs. As for SOE vs SOE & Listed zero is not in the 95% confidence interval it can be concluded that there is significant effect size.

PNED

Table 26 to 28 contain the results for Effect size.

.esize unpaired PNED_ListedPrivate == PNED_unlistedSOE, cohensd hedgesg glassdelta pbcorr
unequal welch

Effect size based on mean comparison, unequal variance

Number of obs = 327

Table 26. Effect Size Test for PNED

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	-2.222195	-2.561996	-1.878834
Hedges's g	-2.217062	-2.556078	-1.874494
Glass's Delta 1	-1.479142	-1.764974	-1.189693
Glass's Delta 2	-4.9192	-5.449528	-4.386207
Point-Biserial r	-.8068977	-.8171373	-.7503734

Welch degrees of freedom = 140.8197

Source: Authors, 2022

.esize unpaired PNED_ListedPrivate == PNED_listedSOE, cohensd hedgesg glassdelta pbcorr unequal
welch

Effect size based on mean comparison, unequal variance

Number of obs = 145

Table 27. Effect Size Test for PNED

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	-1.093801	-1.618104	-.5621349
Hedges's g	-1.088052	-1.6096	-.5591806
Glass's Delta 1	-1.036298	-1.544269	-.5244652
Glass's Delta 2	-2.781388	-3.821858	-1.722278
Point-Biserial r	-.7167873	-.7982293	-.587213

Welch degrees of freedom = 65.2048

Source: Authors, 2022

.esize unpaired PNED_unlistedSOE == PNED_listedSOE, cohensd hedgesg glassdelta pbcorr unequal
welch

Effect size based on mean comparison, unequal variance

Number of obs = 218

Table 28. Effect Size Test for PNED

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	1.442689	.7715997	2.093688
Hedges's g	1.437673	.7689169	2.086409
Glass's Delta 1	1.47277	.9675476	1.974584
Glass's Delta 2	1.188577	.5538584	1.802395
Point-Biserial r	.7447604	.4751494	.8584929

Welch degrees of freedom = 19.2858

Source: Authors, 2022

As for all categories zero is not in the 95% confidence interval it can be concluded that there is significant effect size for PNEs.

ROTA

Table 29 contains the results for Effect size comparing listed private firms against unlisted SOEs.

.esize unpaired ROTA_ListedPrivate == ROTA_unlistedSOE, cohensd hedgesg glassdelta pbcorr unequal welch

Effect size based on mean comparison, unequal variance

Number of obs = 327

Table 29. Effect Size Test for ROTA LUSE Data v SOE Data

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.8850763	.6517387	1.117146
Hedges's g	.883032	.6502333	1.114566
Glass's Delta 1	1.090862	.8293319	1.34917
Glass's Delta 2	.8025104	.5656791	1.03754
Point-Biserial r	.4224255	.330678	.502396

Welch degrees of freedom = 320.1542

Source: Authors, 2022

As zero was not in the 95% confidence interval we conclude that there is significant effect size in ROTA data for LUSE companies compared to SOEs.

Table 30 contains the results for Effect size.

.esize unpaired ROTA_ListedPrivate == ROTA_listedSOE, cohensd hedgesg glassdelta pbcorr unequal welch

Effect size based on mean comparison, unequal variance

Number of obs = 145

Table 30. Effect Size Test for ROTA LUSE Data v SOE & Listed Data

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	.6127666	.1053611	1.115512
Hedges's g	.6095462	.1048074	1.109649
Glass's Delta 1	.5808223	.0809006	1.078487
Glass's Delta 2	1.520971	.8023694	2.21768
Point-Biserial r	.501653	.2966803	.6564979

Welch degrees of freedom = 62.7947

Source: Authors, 2022

As zero was not in the 95% confidence interval we conclude that there is significant effect size in ROTA data for LUSE companies compared to SOEs that are listed.

Table 31 contains the results for Effect size.

.esize unpaired ROTA_unlistedSOE == ROTA_listedSOE, cohensd hedgesg glassdelta pbcorr unequal welch

Effect size based on mean comparison, unequal variance

Number of obs = 218

Table 31. Effect Size Test for ROTA SOE v SOE & Listed Data

Effect Size	Estimate	(95% confi.	Interval)
Cohen's d	-.3896062	-.8746201	.0979431
Hedges's g	-.3882516	-.8715792	.0976025
Glass's Delta 1	-.3752189	-.858464	.1089632
Glass's Delta 2	-1.335616	-1.981432	-.6685177
Point-Biserial r	-.4071147	-.5627778	-.2035746

Welch degrees of freedom = 75.5124

Source: Authors, 2022

As zero was in the 95% confidence interval we conclude that there is no significant effect size in ROTA data for unlisted SOE companies compared to listed SOEs except for the Galss's Delta 2 and Point=Biserial r where zero was not in the 95% confidence interval implying that there is a significant size effect.

The reported results do not suffer from multicollinearity, autocorrelation or heteroskedasticity problems and prior to conducting t-tests of comparison of variances, the normality of the data was assessed using numerical methods by use of the Shapiro-Wilk test, the Shapiro-Francia test and the Skewness/Kurtosis tests. The PNED, BSIZ, PFEM variables were found not to be correlated using the Hausman test.

5. Conclusion and Contribution

5.1 Conclusion

Corporate governance practices and firm financial performances between SOEs and listed firms in Zambia were significantly different. The board sizes for listed firms were statistically significantly less than those of SOEs and the proportion of non-executive directors on the boards of listed firms were also statistically significantly less than those of SOEs. On the other hand the proportion of female

directors on listed firms were statistically significantly more than those of SOEs. In terms of firm financial performance, it was concluded that the mean of the ROTA for listed firms was statistically significantly greater than the mean for SOEs. There were significant effect sizes.

5.2 Contribution To Knowledge

The study has contributed to the body of knowledge through its comparison of the corporate governance practices and firm financial performances using corporate governance factors (board size, proportion of NEDs and proportion of female directors) and objective measures of financial performance (ROTA) and how these differed between unlisted SOEs, listed SOEs and listed private firms.

5.3 Limitations of the Study

The study was limited by the following:

- i. Limited availability of annual reports as not all the SOEs had audited financial statement for the period 2002 to 2017;
- ii. The study was based on the study of Zambian SOEs therefore generalisation of the findings to any SOE was limited;
- iii. The limited number of corporate governance attributes examined as there many other attributes that could be used as proxies for corporate governance; and
- iv. The measure of firm financial performance was limited to ROTA.

5.4 Suggestions for Further Research

It is suggested that further research could be conducted to extend the research by undertaking a qualitative approach to gain more understanding on the reported differences in the corporate governance practices and firm performances between SOEs and listed firms.

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