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# ANALYSIS OF THE EFFECT OF CORPORATE SOCIAL INVESTMENT ON RESOURCE EFFICIENCY

*Abstract. Corporate sustainability is a key priority on many companies' agendas since they must report on it. Companies invest in corporate sustainability programs to maintain compliance while still making a profit. Therefore, the purpose of this study is to evaluate the effect of corporate social investment (CSI) on corporate resource efficiency ( where resource efficiency is represented by water and energy consumption) of companies listed in the FTSE/JSE Responsible Investment Index. The applied method is in two phases, firstly the paper's theoretical foundation is inclined on the stakeholder and agency theory, which is further buttress by empirical literature. Secondly, the study adopted quantitative research method to collect and analyse secondary data. The secondary data used in this paper was collected from annual integrated reports of 24 social investment performing companies listed in FTSE/JSE Responsible Investment Index. The secondary data was analysed through the application of feasible generalised least squares (FGLS) and panel corrected standard error for model(PCSE). It also tested for regression compliance by applying various tests such as Heteroscedasticity, Multicollinearity, Autocorrelation using the Correlation matrix, Variance inflation factor, Wooldridge test and Wald test. Therefore using the FGLS and PCSE, the paper tested two models arising from the two dependent variables representing resource efficiency. Findings from this study show a positive relationship between corporate social investment on water an energy resource efficiency at P<0.10. The implication of the findings is that companies that engage and improve upon their social investment are more likely to achieve a dual positive benefit of environmental resource efficiency (water reduction and energy reduction), which would indirectly lead to cost savings and enhance profit. Further implication is that the achievement of environmental resource efficiency would also attract good reputation to the companies.*

*Keywords: Corporate social investment, water consumption, energy consumption, corporate social investment, Broad-Based Black Economic Empowerment (BBBEE) investment.*

**JEL Classification:** J3, M4, L2

*Анотація. Корпоративна сталість є ключовим пріоритетом у порядку денному багатьох компаній, оскільки вони зобов'язані звітувати про неї. Компанії інвестують у програми корпоративної сталості з метою дотримання нормативних вимог і водночас отримання прибутку. Відтак, мета цього дослідження полягає в оцінці впливу корпоративних соціальних інвестицій (CSI) на ефективність використання ресурсів (де ефективність використання ресурсів представлена споживанням води та енергії) компаніями, що входять до індексу FTSE/JSE Responsible Investment Index. Методологія дослідження складається з двох етапів. По-перше, теоретичну основу статті сформовано на базі теорії зацікавлених сторін і агентської теорії, що додатково підкріплено емпіричними дослідженнями. По-друге, було використано кількісний метод дослідження для збору та аналізу вторинних даних. Вторинні дані отримано з річних інтегрованих звітів 24 компаній, що реалізують соціальні інвестиції та включені до індексу FTSE/JSE Responsible Investment Index. Дані проаналізовано за допомогою методу здійснених узагальнених найменших квадратів (FGLS) та коригованої на панельну вибірку стандартної похибки (PCSE). Також проведено перевірку відповідності регресійної моделі за допомогою тестів на гетероскедастичність, мультиколінеарність, автокореляцію, зокрема з використанням кореляційної матриці, індексу інфляції дисперсії (VIF), тестів Вулдріджа та Вальда. Отже, з використанням FGLS і PCSE, у статті протестовано дві моделі, що відповідають двом залежним змінним, які представляють ефективність використання ресурсів. Результати дослідження вказують на позитивний зв'язок між корпоративними соціальними інвестиціями та ефективністю використання водних і енергетичних ресурсів при рівні значущості P<0.10. Це означає, що компанії, які здійснюють соціальні інвестиції та вдосконалюють їх, мають більше шансів досягти подвійної позитивної вигоди: підвищення ефективності використання екологічних ресурсів (зменшення споживання води та енергії), що опосередковано веде до скорочення витрат і зростання прибутку. Додатково, досягнення екологічної ефективності сприятиме зміцненню репутації компаній.*

*Ключові слова: корпоративні соціальні інвестиції, споживання води, споживання енергії, корпоративні соціальні інвестиції, інвестиції у програму широкомасштабного економічного розширення для темношкірої більшості населення (BBBEE).*

*Absztrakt. A vállalati fenntarthatóság számos cég napirendjén kiemelt prioritást élvez, mivel kötelesek erről jelentést tenni. A cégek vállalati fenntarthatósági programokba fektetnek be annak érdekében, hogy megfeleljenek a szabályozási követelményeknek, miközben továbbra is nyereséget termelnek. Ennek megfelelően a tanulmány célja annak vizsgálata, hogy a vállalati társadalmi befektetések (CSI) milyen hatással vannak az erőforrás-hatékonyságra – amelyet a víz- és energiafogyasztás képvisel – azon vállalatok esetében, amelyek szerepelnek a FTSE/JSE Responsible Investment Index-ben. A kutatás módszertana két szakaszból áll. Először a dolgozat elméleti megalapozása az érintettek elméletére és az ügynökelméletre támaszkodik, amit empirikus szakirodalom támaszunkt alá. Másodszor, a tanulmány kvantitatív kutatási módszert alkalmazott másodlagos adatok gyűjtésére és elemzésére. Az elemzéshez használt másodlagos adatokat 24 olyan vállalat éves integrált jelentéseiből gyűjtöttük össze, amelyek társadalmi befektetéseket hajtanak végre, és szerepelnek a FTSE/JSE Responsible Investment Index-ben. Az adatokat megvalósítható általánosított legkisebb négyzetek (FGLS) módszerével és a panelre korrigált standard hibával (PCSE) elemeztük. A regressziós modell megfelelőségét több statisztikai teszttel is vizsgáltuk, például heteroszkedaszticitási, multikollinearitási és autokorrelációs tesztekkel, ideértve a korrelációs mátrixot, a varianciainflációs faktort (VIF), a Wooldridge- és Wald-teszteket. A FGLS és PCSE módszerek alkalmazásával a tanulmány két modellt tesztelt, amelyek az erőforrás-hatékonyságot képviselő két függő változóra épültek. A kutatás eredményei pozitív összefüggést mutatnak a vállalati társadalmi befektetések és a víz-, illetve energiahatékonyság között, 10%-os szignifikanciaszinten (P<0,10). Ez azt jelenti, hogy azok a vállalatok, amelyek aktívan foglalkoznak társadalmi befektetésekkel és javítják ezeket, nagyobb valószínűséggel érnek el kettős előnyt: környezeti*

*erőforrás-hatékonyságot (a víz- és energiafogyasztás csökkentését), amely közvetetten költségmegtakarításhoz és nyereségnövekedéshez vezethet. További következményként a környezeti hatékonyság elérése hozzájárulhat a vállalat jó hírnevének erősítéséhez is.*

*Kulcsszavak: vállalati társadalmi befektetés, vízfogyasztás, energiafogyasztás, vállalati társadalmi befektetés, széles körű fekete gazdasági megerősítésre irányuló befektetés (BBBEE).*

**Problem statement.** Corporate sustainability helps businesses be efficient in cost and resources over the long-term thereby avoiding equity problems while improving profitability [1]. While cost efficiency concern how companies save money by changing their operations, resource efficiency involves the usage of natural resources in a manner that is sustainable and resourceful [1; 2]. In other words, resource efficiency is the viable consumption of natural resources such as energy and water. When companies maintain cost efficiency and resource efficiency, they are likely to achieve better profitability. Research has shown that corporates make a significant contribution to emissions and pollution through the manufacture of resources such as energy as well as consumption of water [3]. There is an urgent need to decrease and/or reverse the negative impacts associated with some practices on poor corporate sustainability, a motivating factor for businesses to focus on increasing investments towards addressing sustainability challenges [4]. Hesitancy by companies to channel significant financial resources towards enforcing good sustainable practices has rarely solved the deteriorating environmental quality [5].

**Literature review.** The literature review section which follows bellow is arranged to firstly provide the theoretical foundation, namely the stakeholder and agency theories, and thereafter, the review of empirical literature follows.

*Stakeholder theory.* There is a direct and indirect way in which stakeholders influence companies, whether they are internal or external stakeholders. For example, employees whose main influence is to contribute positively towards the operations and success of companies are stakeholders. The main stakeholders of companies are society, considered by the stakeholder theory, and influencers of various decisions, policies, and business operations [6]. The emphasis on the need by companies to create some relationships by the stakeholder theory has enhanced investments in many companies [7]. [8] argue that when companies attend to more social issues through social sustainability investment, it attracts more stakeholders, and it can affect their profitability while enhancing their stakeholder value. By recognising and applying the stakeholder theory, companies perform better, promoting interrelations between stakeholders. The justification for adopting the stakeholder theory is that companies have the responsibility to satisfy the needs of all their stakeholders and resource efficiency, that is, minimising the use of water and energy is one avenue of exercising this responsibility.

*Agency theory:* Most companies rely on relationships with their shareholders to gain access to resources that help managers meet stakeholders' needs, maximise profit, and utilise resources effectively. Stakeholder pressure, however, may cause companies to not completely adhere to social or environmental standards, which may prevent

them from being resource efficient [9]. In the study of [10] it was revealed that there is negative relationship between agency theory and social sustainability. It is argued that the pressure from stakeholders may cause companies to change their priorities, allowing them to overlook their obligations to serve society and protect the environment [11]. Agency theory is often related to corporate sustainability investments through their involvement in corporate sustainability activities and it enhances their profitability. Adopting and applying the agency theory is likely to assist companies with stakeholders, which in return benefits companies.

*Empirical literature.* Companies tend to believe that investment in social sustainability improves profitability since some of their engagements are educational to society [12]. However, [13] argue that there is a need to explore social sustainability, which can expand the need for social sustainability investment. There is a need to have practices in place for social sustainability. Investment in social sustainability allows companies to promote healthy and productive living through social sustainability practices by addressing certain risks in areas that lack. [14] and [15] allude to the fact that social investment has an impact on resource efficiency. [15] revealed a negative relationship between training and education, donations (corporate social investment), BBBEE investment and energy usage (resource efficiency). [14] found that there is a positive relationship between community donations and education (corporate social investment) and energy usage (resource efficiency). [15] used a case study with a sample of two companies through qualitative and quantitative research approaches. [14] used a case study method on a sample of 21 communities through a quantitative research approach. Furthermore, the differences in the sample size and research analysis may have led to the differences in the direction of social investment on resource efficiency and profitability. Social sustainability such as corporate social responsibility strive to be resource efficient by meeting the social needs of communities. This indicate that investment is directly related to corporate sustainability and fulfil the corporate social strategy of companies. The aim of the study is to determine the effect of corporate social investment on resource efficiency.

**Methodology.** The positivist paradigm was used in the study since it evaluated the relationship between quantitative variables, which were measured statistically. This study made use of the information on sustainability from companies listed on the JSE because it offers efficient, safe primary and secondary capital markets for various securities, backed by regulatory and post-trade services. The researcher used 24 performing FTSE/JSE Responsible Investment Index companies as indicated by JSE. The study adopts the below stated models.

$$WATECO_{it} = \alpha_i + \beta_1\,CSI_{it} + \beta_2\,BBINV_{it} + \beta_3\,MKTCAP_{it}\varepsilon_{it} \quad (1)$$

$$ENERCO_{it} = \alpha_i + \beta_1\,CSI_{it} + \beta_2\,BBINV_{it} + \beta_3\,MKTCAP_{it}\varepsilon_{it} \quad\quad (2)$$

Where; $WATECO$ is water consumption, $ENERCO$ is the energy consumption, CSI is Corporate Social Investment, BBINV is BBBEE investment and MKTCAP stands for market capitalisation $\beta_1, \beta_2, \beta_3$ and $\beta_4$ are model parameters while $\alpha$ denotes intercept which is the value that the water consumption and energy consumption will take if all explanatory variables take the value of zero. Moreover, $\varepsilon_{it}$ signifies the disturbance error term. The disturbance error term account for the effect of other

unaccounted variables that have a direct or indirect economic relationship with water consumption and energy consumption.

**Results and discussions.** Descriptive Statistics for model 1. This section presents empirical findings. Table 1 indicates the aforementioned variables along with the mean, standard deviation, minimum and maximum values, and the number of observations. In this model 1, water investment is the outcome variable with an average of 12.21, the minimum is 6.99 and the maximum is 18.41. The variables were log (logarithm) and ranges between 1 and 2 digits. Corporate Social Investment has a mean of 11.34, a minimum value of 3.09 and maximum value of 14.79. The BBBEE investment has an average of 10.71 with a minimum value of 7.65 and a maximum value is 18.75. Market capitalisation has an average of 18.08, minimum is 17.83 and the maximum is 0.87.

**Table 1-Descriptive Statistics for model 1**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Water consumption | 120 | 12.206 | 2.626 | 6.999 | 18.405 |
| Corporate Social Investment | 120 | 11.338 | 2.006 | 3.091 | 14.785 |
| BBBEE investment | 119 | 10.707 | 2.478 | 7.65 | 18.75 |
| Market capitalisation | 120 | 18.082 | .233 | 17.827 | 18.503 |

*Note: All variables are log (logarithm)*
*Source: Stata outcomes*

Correlations analysis for model 1. The correlation analysis of dependent variable water consumption and independent variables corporate social investment, BBBEE investment and control variable market capitalisation are presented in Table 2. The correlation suggested that Water consumption and Corporate Social Investment ($r = 0.16$) are positively correlated. Water consumption and BBBEE investment are likely to be positively correlation ($r = 0.23$). Whereas water investment and market capitalisation ($r = -0.028$) are negatively correlated.

**Table 2-Matrix of correlations for model 1**

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| (1) Water consumption | 1.000 | | | |
| (2) Corporate Social Investment | 0.158 | 1.000 | | |
| (3) BBBEE investment | 0.230 | 0.431 | 1.000 | |
| (4) Market capitalisation | -0.017 | -0.022 | 0.089 | 1.000 |

*Source: Stata outcomes*

Multicollinearity test for model 1. Table 3 presents variance inflationary factors (VIF) analysis. The basic rule is that the variance inflationary factors (VIF) cannot be more than 10. Otherwise, the model can show signs of collinearity. Given that the mean VIF is 1.160, which is less than 10, multicollinearity is absent from the data.

Heteroscedasticity Test results for model 1. Table 4 presents the heteroscedasticity test for model 1, which pits the possibility of heteroscedasticity in the panel data against the null hypothesis that there is no heteroscedasticity in the data. The null hypothesis indicated that there is no heteroskedasticity in the panel data and is rejected if the estimated probability is less than or equal to the critical value of 0.05.

The null hypothesis, according to which there is no heteroscedasticity in the panel data in model 1, is rejected because the p-value is less than the critical value of 0.05. We reject the null hypothesis that there is no heteroscedasticity in the model 1. Hence, there is a presence of heteroskedasticity in panel data in model 1, which could be responsible for the insignificant in the results.

**Table 3-Variance inflation factor for model 1**

| Variables | VIF | 1/VIF |
|---|---|---|
| BBBEE investment | 1.240 | 0.805 |
| Corporate Social Investment | 1.230 | 0.811 |
| Market capitalisation | 1.010 | 0.988 |
| Mean VIF | 1.160 | |

*Source: Stata outcomes*

Heteroscedasticity Test results for model 1. Table 4 presents the heteroscedasticity test for model 1, which pits the possibility of heteroscedasticity in the panel data against the null hypothesis that there is no heteroscedasticity in the data. The null hypothesis indicated that there is no heteroskedasticity in the panel data and is rejected if the estimated probability is less than or equal to the critical value of 0.05. The null hypothesis, according to which there is no heteroscedasticity in the panel data in model 1, is rejected because the p-value is less than the critical value of 0.05. We reject the null hypothesis that there is no heteroscedasticity in the model 1. Hence, there is a presence of heteroskedasticity in panel data in model 1, which could be responsible for the insignificant in the results.

**Table 4-Modified Wald test for groupwise heteroskedasticity for model 1**

| | Coef. |
|---|---|
| Chi-square test value | 2.1e+06 |
| P-value | 0.0000 |

*Source: Stata outcomes*

Autocorrelation for model 1. The results for autocorrelation test for model 1 are based on the dependent variable water consumption and independent variables corporate social investment, BBBEE investment and control variable market capitalisation for model 1. Table 5 demonstrates model 1's autocorrelation test. There is autocorrelation, according to the alternative hypothesis, whereas the null hypothesis claims that there is none. When the p-value is greater than 0.05, the null hypothesis is accepted. The computed probability value is found to be statistically insignificant at of 0.079 thus implying that the null hypothesis is accepted.

**Table 5-Wooldridge test for autocorrelation in panel data for model 1**

| | Coef. |
|---|---|
| F (1,23) | 3.371 |
| Prob > F | 0.079 |

*Source: Stata outcomes*

Test of normality for model 1. Figures 1 represent the test of normality using the Epanechnikov kernel density estimates of model 1. The independent variables and dependent are likely normally distributed because the dataset kernel density is symmetrical and smooth. At 0.82, the Epanechnikov bandwidth is comparatively small.
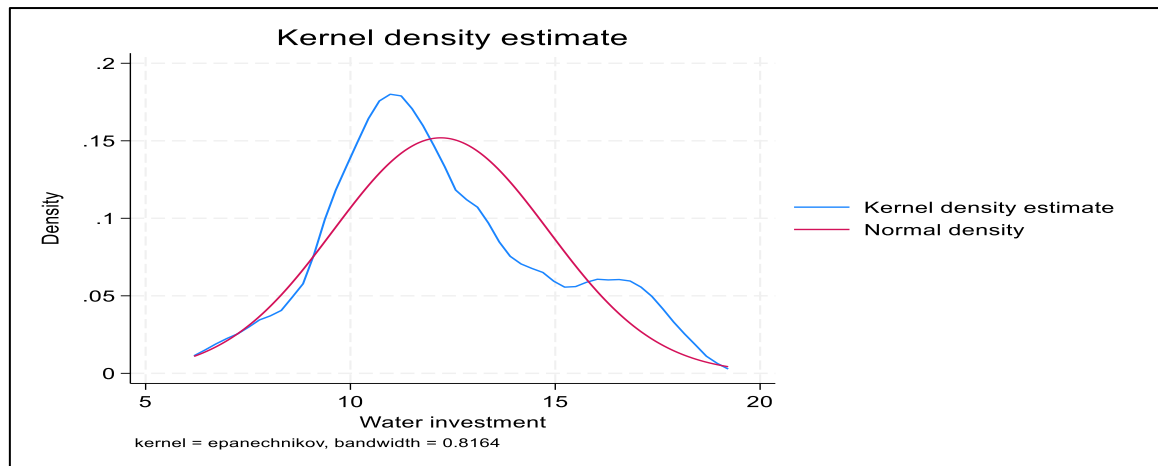


**Fig. 1. Kernel density of model 1**

*Source: Stata outcomes*

Interpretation for model 1 FGLS and PCSE results. The findings for model 1's feasible generalised least squares are shown in Table 6. Due to the panel data's heteroscedasticity, which indicates that the study's findings have been inflated and not reliable unless the heteroscedasticity problem has been resolved, this regression was applied. The results' validity is achieved by controlling for cointegration, serial correlation, and heteroscedasticity using feasible generalised least squares error [16]. The presence of cross-sectional dependency, robustness check, and consistency of results are all controlled for by panel corrected standard error [17;18]. Column (1) presents the estimation of model 3 using feasible generalised least squares. The results show that corporate social investment has an insignificant positive effect on water consumption. BBBEE investment has a significant positive influence on water consumption. Whereas market capitalisation has an insignificant negative relationship with water consumption. Column (2) presents the results of the estimation of panel-corrected standard error estimator. The results show that corporate social investment has an insignificant positive effect on water consumption. BBBEE investment has a significant positive influence on water investment. Whereas market capitalisation has an insignificant negative relationship with water consumption.

The results in Table 6 show that corporate social investment had an insignificant positive effect on water consumption. BBBEE investment had an insignificant positive influence on water consumption. Market capitalisation had an insignificant negative relationship with water consumption. Based on the findings, three out of three variables of corporate social investment were correlated to water consumption. Therefore, it is concluded that based on the dominance there existed a positive impact

between corporate social investment and water consumption.

**Table 6-Feasible generalised least squares and panel corrected standard error for model 1**

|  | **(1)** **Main results** |  | **(2)** |
|---|---|---|---|
|  | FGLS | z | PCSE |
| Variables | Water consumption |  | Water consumption |
|  |  |  |  |
| Corporate Social Investment | 0.0910* | 0.70 | 0.0910* |
|  | (0.129) |  | (0.0599) |
| BBBEE investment | 0.216** | 2.05 | 0.216*** |
|  | (0.105) |  | (0.0581) |
| Market capitalisation | -0.373* | -0.37 | -0.373* |
|  | (1.011) |  | (0.300) |
| Constant | 15.62 | 0.85 | 15.62* |
|  | (18.31) |  | (5.557) |
|  |  |  |  |
| Observations | 119 |  | 119 |
| R-squared |  |  | 0.058 |
| Number of Code | 24 |  | 24 |

*Standard errors in parentheses: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Feasible Generalised Least Squares (FGLS) and the Panel Corrected Standard Error (PCSE)*
*Source: Stata outcomes*

The following sections discusses the results for model 2. The descriptive statistics shown in Table 7 indicates the aforementioned variables along with the mean, standard deviation, minimum and maximum values, and the number of observations. The descriptive statistics of key variables in model 4 in the current study indicate that energy consumption has an average of -0.023, the minimum is -7.42 and the maximum is 3.20. Corporate Social Investment has an average of 0.05 with a minimum value of -4.58 and maximum of 5.41. The BBBEE investment has a mean of -0.02, with a minimum value of -6.59 and a maximum value of 7.22. The market capitalisation is 0.03 on average, with a minimum of -0.68 and the maximum is 0.40.

**Table 7-Descriptive Statistics for model 2**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Energy consumption | 96 | -0.023 | 1.127 | -7.423 | 3.201 |
| Corporate Social Investment | 96 | 0.052 | 1.201 | -4.579 | 5.405 |
| BBBEE investment | 95 | -0.016 | 1.927 | -6.593 | 7.222 |
| Market capitalisation | 96 | 0.033 | 0.42 | -0.676 | 0.402 |

*Note: All variables are log (logarithm)*
*Source: Stata outcomes*

Correlations analysis for model 2
The correlation analysis of model 2 indicates dependent variable energy consumption

and independent variables corporate social investment, BBBEE investment and control variable market capitalisation. In Table 8, energy consumption and Corporate Social Investment (r = 0.40) are positively correlated. Energy consumption and BBBEE investment (r = -0.01) are negatively correlated. Also, energy consumption and market capitalisation (r = -0.027) are negatively correlated.

### Table 8-Matrix of correlations for 2

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| (1) Energy consumption | 1.000 | | | |
| (2) Corporate Social Investment | 0.402 | 1.000 | | |
| (3) BBBEE investment | -0.014 | 0.037 | 1.000 | |
| (4) Market capitalisation | -0.027 | -0.077 | 0.167 | 1.000 |

*Source: Stata outcomes*

Multicollinearity test for model 2. Table 9 presents variance inflationary factors (VIF) analysis. It is generally accepted that the variance inflationary factors (VIF) cannot exceed 10. Failure to do so may result in collinearity in the model. The data supplied does not exhibit multicollinearity, as indicated by the mean VIF of 1.025, which is less than 10.

### Table 9-Variance inflation factor for Model 2

| | VIF | 1/VIF |
|---|---|---|
| Market capitalisation | 1.036 | .965 |
| BBBEE investment | 1.031 | .97 |
| Corporate Social Investment | 1.009 | .992 |
| Mean VIF | 1.025 | . |

*Source: Stata outcomes*

Heteroscedasticity test results for model 2. Table 10 indicates the heteroscedasticity test for model 2, which pits the alternative of heteroscedasticity in the panel data against the null hypothesis that there is no heteroscedasticity in the data. The hypothesis stating that there is no heteroskedasticity in the panel data is rejected if the estimated probability is less than or equal to the significant value of 0.05. The null hypothesis that there is no heteroscedasticity in the panel data in model 4 is rejected because the p-value is less than the critical value of 0.05. Therefore, considering that the tests were conducted after a control variable was included in a regression model, there is undesired heteroscedasticity in the panel data. This means that the study's findings are erroneous and unreliable until the heteroscedasticity issue is addressed.

### Table 10-Modified Wald test for groupwise heteroskedasticity for model 2

| | Coef. |
|---|---|
| Chi-square test value | 7.9e+06 |
| P-value | 0.0000 |

*Source: Stata outcomes*

**Autocorrelation test for model 2.** Table 11 displays the model 2 autocorrelation test. There is autocorrelation, according to the alternative hypothesis, whereas the null hypothesis claims that there is none. A p-value of greater than 0.05 indicates acceptance of the null hypothesis. Consequently, since the calculated probability value is 0.609, the null hypothesis is accepted. Therefore, the inference that follows is that the variables in model 2 do not exhibit autocorrelation.

**Table 11-Wooldridge test for autocorrelation in panel data for model 2**

|  | Coef. |
|---|---|
| F (1,23) | 0.268 |
| Prob > F | 0.609 |

*Source: Stata outcomes*

Test of Normality for model 2

Figures 2 denote the test of normality using the Epanechnikov kernel density estimates of energy consumption and independent variables corporate social investment, BBBEE investment and control variable market capitalisation. Based on figure 2 the dataset kernel density is smooth and symmetrical, which implies that variables are normally distributed. The Epanechnikov bandwidths are low, at 0.03.
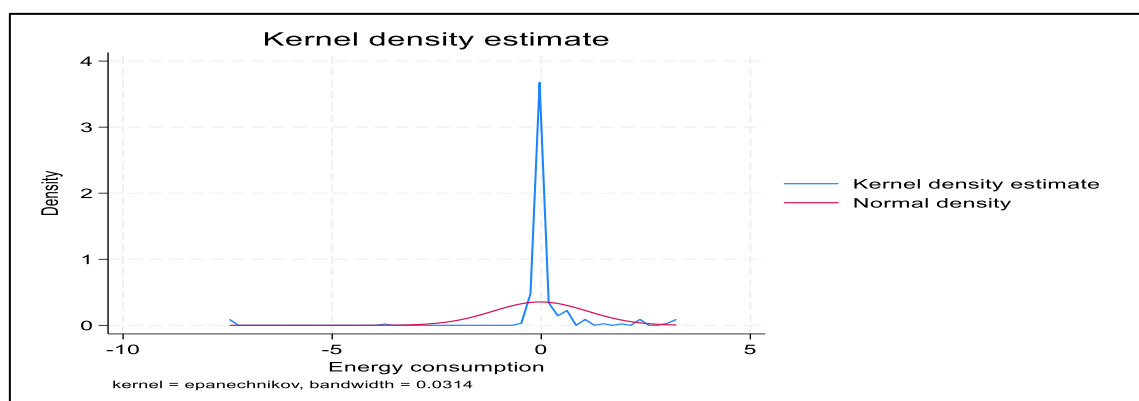


**Fig. 2. Kernel density of model 2**

*Source: Stata outcomes*

Interpretation for model 2 FGLS and PCSE results. Table 12 column (1) presents the results of feasible generalised least squares. The results show that corporate social investment has an insignificant positive impact on energy consumption. While BBBEE investment has a significant negative impact on energy consumption. Market capitalisation has a significant positive impact on energy consumption. Column (2) reveals the results of panel-corrected standard error estimator. The results show that corporate social investment has a significant positive impact on energy consumption. While BBBEE investment has an insignificant negative impact on energy consumption. Market capitalisation has a significant positive impact on energy consumption.

### Table 12-Feasible generalised least squares and panel corrected standard error for model 2

|  | (1) |  | (2) |
|---|---|---|---|
|  | FGLS | z | PCSE |
| Variables | Energy consumption |  | Energy consumption |
| Corporate Social Investment | 0.380* | 4.29 | 0.380* |
|  | (0.0886) |  | (0.133) |
| BBBEE investment | -0.0181** | -0.32 | -0.0181** |
|  | (0.0561) |  | (0.0593) |
| Market capitalisation | 0.0238** | 0.09 | 0.0238** |
|  | (0.257) |  | (0.286) |
| Constant | -0.0402 | -0.38 | -0.0402 |
|  | (0.106) |  | (0.139) |
| Observations | 95 |  | 95 |
| R-squared |  |  | 0.163 |
| Number of Code | 24 |  | 24 |

*Standard errors in parentheses: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Feasible Generalised Least Squares (FGLS) and the Panel Corrected Standard Error (PCSE)*
*Source: Stata outcomes*

Table 12 show results of model 2 that indicate that corporate social investment had an insignificant positive impact on energy consumption. While BBBEE investment had a significant negative impact on energy consumption. Market capitalisation had a significant positive impact on energy consumption. Based on the results, two out of three variables of corporate social investment were correlated to energy consumption. Therefore, it is concluded that based on the dominance there was a positive impact between corporate social investment and energy consumption. The results contrast with that by [14] which showed a positive relationship between community donations and education (corporate social investment) and energy usage (resource efficiency). On the other hand, the results were not consistent with that by [15] who found a negative relationship between training and education, donations (corporate social investment), BBBEE investment, and energy usage (resource efficiency). [19] assert that, in addition to maximising profits, corporations should also fulfil their needs whether they be social, environmental, or economic as this is a key component of the stakeholder theory. Profit maximisation and resource efficiency are balanced when stakeholders in businesses that practice sustainability have a thorough awareness of social sustainability [20].

**Conclusions and prospects for further research.** The aim of the study was to analyse the effect of corporate social investment on resource efficiency. The study had two models which were as follows: model 1 with dependent variable water consumption and independent variables corporate social investment, BBBEE investment and control variable market capitalisation. Model 2 follows dependent variable energy consumption and independent variables corporate social investment, BBBEE investment and control variable market capitalisation.

The findings indicate a positive relationship between corporate social

investments on resource efficiency. This suggests that if companies make social investments, the South African economy would expand more since employment would be created and more effective methods of production will be developed. Due to the capabilities derived from the social investment efforts provided by companies, this would aid in the economic transformation. Increased awareness of the value of environmental health would benefit the primary resource efficiency of the companies included in the study. Companies may become more competitive and foster innovation by promoting resource efficiency. It is recommended that companies should invest more on social investment since it builds on the reputation of companies, and this helps to maintain resource efficiency that in turn helps with the wellbeing of societies. In accordance with the results from the data, the researcher recommends that future research in this area be on different industries of companies listed on the JSE.

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