

УДК 336.781.2

JEL Classification M41, M40, Q56

DOI [https://doi.org/10.33146/2307-9878-2022-3\(97\)-56-61](https://doi.org/10.33146/2307-9878-2022-3(97)-56-61)Collins C Ngwakwe¹

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The Relationship between Water/Energy Reduction and Shareholders' Dividend Yield

Abstract. In a world of increasing energy and water scarcity, companies are devising new technical and operational strategies to reduce energy and water consumption – especially the ratio of water and energy usage to units of production. Savings derivable from such environmental resource conservation contribute to cost reduction, which invariably result in better financial performance. This paper analysed the relationship between water and energy reduction on dividend yield. Many studies on water and energy efficiency's effect on financial performance have paid little attention to dividend yield – hence this paper contributes to the academic science. The paper applied a positivist paradigm and hence a quantitative approach. Data on energy reduction, water reduction, and dividend yield were from the Coca-Cola financial and sustainability reports for different years. A simple regression analysis was applied to the data analysis. Research results indicate that at an alpha level of 0.05%, energy and water reduction are significantly related to dividend yield at a p-value of $P < 0.05$. Thus, the increase in the dividend, which emerged from water and energy reduction, has a practical significance for Coca-Cola Company and other beverage industries. The paper provides practical and research recommendations based on which the beverage industry may contribute to environmental resource conservation by devising a strategy to reduce water and energy per unit of production. Furthermore, the paper recommends further study on this concept to apply dividend yield as a financial performance proxy and expand the study time series whilst accommodating other beverage industries.

Keywords: dividend yield, water reduction, energy reduction, resource efficiency, environmental accounting, corporate sustainability.

Suggested Citation

Ngwakwe, C. C (2022). The Relationship between Water/Energy Reduction and Shareholders' Dividend Yield. *Oblik i finansi*, 3(97), 56-61. [https://doi.org/10.33146/2307-9878-2022-3\(97\)-56-61](https://doi.org/10.33146/2307-9878-2022-3(97)-56-61)

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Зв'язок між скороченням споживання води та енергії і дивідендною прибутковістю акціонерів

Анотація. У світі зростаючого дефіциту енергії та води компанії розробляють нові технічні та операційні стратегії, щоб зменшити споживання цих ресурсів, особливо співвідношення споживання води та енергії до одиниць продукції. Економія, отримана від такого збереження екологічних ресурсів, сприяє зниженню виробничих витрат, що, безумовно, призводить до кращих фінансових показників. У цьому дослідженні проаналізовано зв'язок між зменшенням обсягів споживання води та енергії та дивідендною прибутковістю акціонерів. У багатьох дослідженнях щодо впливу водо- та енергоефективності на фінансові показники мало уваги приділялося дивідендній прибутковості – отже, ця стаття є актуальним внеском в академічну науку. У статті застосовувалася позитивістська парадигма а, отже, і кількісний підхід. Дані щодо обсягів скорочення споживання енергії та води, а також показників дивідендної прибутковості були взяті з фінансових звітів компанії Coca-Cola та звітів про сталий розвиток за різні роки. Для аналізу даних було застосовано простий регресійний аналіз. Результати дослідження показують, що на альфа-рівні 0,05%

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скорочення енергії та води суттєво пов'язані з дивідендною прибутковістю при p -значенні $P < 0,05$. Таким чином, збільшення дивідендів, яке виникло внаслідок скорочення споживання води та енергії, має практичне значення для компанії *Coca-Cola* та інших компаній в галузі виробництва напоїв. У статті надано рекомендації, на основі яких промисловість напоїв може сприяти збереженню ресурсів навколишнього середовища шляхом розробки стратегії скорочення використання води та енергії на одиницю продукції. Крім того, автор рекомендує подальше вивчення цієї теми, щоб застосувати дивідендну дохідність як проксі фінансової ефективності та розширити часовий ряд дослідження, враховуючи при цьому інші галузі виробництва напоїв.

Ключові слова: дивідендна прибутковість, скорочення споживання води, скорочення споживання енергії, ресурсоефективність, екологічний облік, корпоративна стійкість.

INTRODUCTION

Should a beverage company commit funds and technology toward water and energy reduction, and what significance would it be on dividend yield? This is an integrated research question that apparently exudes from the literature, which until now has not yet received an answer given that previous researchers on the financial benefit of water and energy efficiency appear to have neglected the dividend yield as a financial performance proxy. This paper bridges this gap and focuses this current paper on the analysis of how water and energy reduction relates to shareholders' dividend yield. This paper is important because the company management needs the board's approval and, by implication, the support of shareholders before committing shareholders' funds to environmentally efficient technologies such as water reduction. Whilst it is recognised that some investors are becoming environmentally responsible (McCann et al., 2003); they may be supportive to environmental investments such as in water and energy reduction if there is a proof that such responsible financial investments may also benefit their shareholding investments in the business through financial returns to their shareholding (Nakamura, 2011).

Making the shareholders aware of the dividend yield value derivable from corporate environmental investment wherein the shareholders own shares will have a bolstering effect toward motivating shareholders support for the board to CEOs and board of directors when they consider the potential for engaging in environmental investment. Some previous research has evaluated how corporate environmental efficacy relates to financial performance; these include inter alia Singh et al. (2016) on environmental performance and financial performance; Moon et al. (2020) on energy efficiency and financial performance, and Sudha et al. (2020) on environmental and financial performance nexus. The problem of this paper is that existing research on the financial implication of energy and water efficiency has largely neglected the usage of dividend yield as a financial performance proxy; it is also scarce to see previous research focusing on data drawn from a single multinational beverage company.

Therefore, the objectives of this paper are to examine the relationship between energy efficiency and dividend yield and to analyse the relationship between water efficiency and dividend yield.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Fan et al. (2017) examined the association amongst energy efficiency and corporate financial performance within a sample of companies in China using a panel dataset technique for a period covering 2010-2014. They used a proxy of six financial variables, which represents the expected benefits of different corporate stakeholders in their analysis. Their empirical research results demonstrate that energy efficacy is positively associated with firm's financial return on equity, also related with return on assets. Furthermore, their results also show that efficiency with usage of energy is associated with firm's return on investment, return on the invested capital and return on turnover of sales. In addition, they also examined the possible interaction between energy usage intensity and corporate growth and discovered that corporate growth assists toward enhancing a positive association between energy usage intensity and corporate financial performance. Accordingly, Fan et al. (2017) findings offer a practical motivation for companies to adopt a proactive strategy in their target towards energy sustainability, conservation and eventual emissions reduction in operations and services.

In a study on buildings' energy efficient effect financial performance, Cajias & Piazzolo (2013) used a large panel framework to conduct research on the impact of energy use on the financial results of German residential buildings. The descriptive analysis results display that buildings with energy-efficiency produce a financial benefit of up to 3.15 percent in an upward trajectory of higher return; this is couple with a 0.76 €/m² higher rent than experienced in inefficient buildings of the same cluster. The regression results show that a 1% reduction in energy use has a positive impact of +0.015% on the total return of buildings. The hedonic results also demonstrate that, ceteris paribus, 1% energy conservation increases market value by 0.45% and rent prices by 0.08 percent.

Pons et al. (2013) examined the association existing between the application of energy efficiency technologies and the performance outcome of manufacturing companies. Their analysis results indicate that the usage of efficient energy technologies does not show a vibrant and major connexion with corporate financial performance. However, a substantial positive relationship showed up between energy efficiency and material savings. Looking at this result deeply, if energy

efficiency results in material savings, this might also provide an indirect good result on financial performance (although anecdotal) – and calling for further research as in this current paper.

Xie et al. (2019) analysed the effect of corporate environmental performance and corporate profitability. They applied the technique of data envelopment analysis and found that corporate environmental activities indicate a relationship with return on asset and market value.

Fu & Jacobs (2022) evaluated the relationship, which exists between improvement in water efficiency, profitability and risk in firms drawn from the global Consumer Packaged Goods industry. They used a sample of 155 companies with a record of annual corporate social performance and financial achievement data from Bloomberg covering the years 2010–2019. They also applied a first-differencing panel data technique with regression models to analyse data.

Findings show that increased application of water efficiency strategy results to an increase in business profit and risk reduction. Results also indicate that firms, which are not water efficient in their operations, experience the opposite, which is low profit.

First Hypothesis

Fu et al. (2022) assert that firms with water efficiency strategy experience improved profitability; Sudha (2020) concur that water efficiency produce a positive effect on financial performance; Singh et al. (2016) find that water

efficiency through product life cycle has a positive effect on financial performance. Since, none of the previous researchers used the dependent variable financial performance proxy with dividend yield, the researcher therefore hypothesizes as follows as the first hypothesis:

H1: water efficiency has a significant relationship with dividend yield at the Coca-Cola Company

Second Hypothesis

Empirical results by Singh et al. (2016) indicate that energy efficiency through product life cycle produce a positive effect on financial performance. Moon & Min (2020) found that energy efficiency has a relationship with firm financial performance. Fan et al. (2017) discover that energy efficiency produce a positive relationship with financial performance represented by return on equity and return on assets. Related previous researchers on energy efficiency and financial performance have not used the dependent variable financial performance proxy with dividend yield, the researcher therefore hypothesizes as follows as the second hypothesis:

H2: energy efficiency has a significant relationship with dividend yield at the Coca-Cola Company

Based on the foregoing literature and hypotheses, this paper inclines on the research framework depicted in Figure 1.

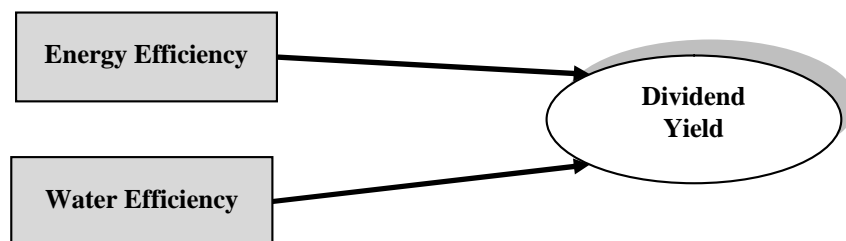


Figure 1. Research Framework

Source: Developed by the author.

RESEARCH METHODS

A research paradigm, design, and method should be anchored on the nature of the research objectives and the nature of research variables implicit in the objectives (Peritz, 1992; Gable, 1994). This paper adopts a positivist paradigm, which is commonly used to analyse quantitative variables. Positivism is linked to the hypothetico-deductive scientific model, which anchors on the verification of a priori hypotheses through the operationalization of variables and the measurement of variables. In general, positivist paradigm studies incline on the identification of explanatory linkage and/or associations or relationships of causal nature established through quantitative research approaches (Park et al., 2020). Given that this research objectives contain

quantitative financial variables, which make up the dependent and independent variables, and also since this research intends to ascertain the association between this variables, the positivist paradigm becomes the suitable paradigm for this paper. Accordingly, the correlational research design is chosen given its alignment with the positivist paradigm and the quantitative method is a fitting approach to enhance the statistical measurement of association between the dependent and independent financial variables.

Data collection for this paper was from the financial and sustainability reports of the Coca-Cola Company for eleven years covering 2011 to 2021. Data collected from were energy usage, water usage and dividend yield.

Data were analysed using the simple regression model represented by:

For objective 1 (Hypothesis 1)

Dependent variable: dividend yield = \check{Y} ; independent variable: water reduction = χ
 $\check{Y} = \alpha + \beta\chi + \varepsilon$ (1)

For objective 2 (Hypothesis 2)

Dependent variable: dividend yield = \check{Y} ; independent variable: energy reduction = χ
 $\check{Y} = \alpha + \beta\chi + \varepsilon$ (2)

RESULTS

Table 1 presents the result for Hypothesis 1 (water reduction has a significant relationship with dividend yield at the Coca-Cola Company). The statistical p-value which emerges from Table 1 show a significant relationship between water reduction and increase in dividend yield at the Coca-Cola Company at a p-value of $p=0.008$, which is less than 5% alpha value. The relationship is of an inverse nature, which is a reduction in water usage produces an increase in dividend yield at a coefficient of -0.0148 . Therefore, hypothesis 1 is accepted given the low p-value, which is less than 5%. Similarly, Table 2 presents the result for Hypothesis 2 (energy reduction has a significant relationship with dividend yield at the Coca-Cola Company). The p-value from Table 2 indicate a significant relationship between energy reduction and increase in dividend yield at the Coca-Cola Company at a p-value of $p=0.004$, which is

less than 5% alpha value. Accordingly, the relationship is also of an inverse nature, which is a reduction in energy usage produces an increase in dividend yield at a coefficient of -0.086 . Therefore, hypothesis 2 is accepted given the low p-value, which is less than 5%. Although previous researchers did not use dividend-yield as a financial performance measure, but this paper’s finding provide a corroboration of previous studies, which has used other financial performance measures in their studies on the relationship between energy and water efficiency on other financial performance. Therefore, the findings of this paper confirm previous research by using data from the Coca-Cola Company to show that water reduction and energy reduction results to an increase in dividend yield. This is in alignment with previous research findings from (example (Fu et al., 2022; Singh et al., 2016) whose results show a relationship between water and energy reduction and financial performance.

Table 1. **Results for Hypothesis 1 (water reduction has a significant relationship with dividend yield at the Coca-Cola Company)**

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.743073							
R Square	0.552158							
Adjusted R	0.502398							
Standard E	0.001664							
Observatic	11							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>			
Regressor	1	3.07E-05	3.07E-05	11.09637	0.008783			
Residual	9	2.49E-05	2.77E-06					
Total	10	5.56E-05						
	<i>Coefficients</i>	<i>andard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>ower 95.0%</i>	<i>pper 95.0%</i>
Intercept	0.059937	0.008756	6.845385	7.51E-05	0.04013	0.079744	0.04013	0.079744
Water.Rat	-0.0148	0.004443	-3.33112	0.008783	-0.02485	-0.00475	-0.02485	-0.00475

Table 2. Results for Hypothesis 2 (energy reduction has a significant relationship with dividend yield at the Coca-Cola Company)

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.777922							
R Square	0.605162							
Adjusted R	0.561291							
Standard Error	0.001562							
Observations	11							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	3.37E-05	3.37E-05	13.79416	0.004815			
Residual	9	2.2E-05	2.44E-06					
Total	10	5.56E-05						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.066147	0.009524	6.945399	6.72E-05	0.044602	0.087691	0.044602	0.087691
Energy	-0.08694	0.023408	-3.71405	0.004815	-0.13989	-0.03399	-0.13989	-0.03399

CONCLUSIONS & RECOMMENDATIONS

In a world of increasing energy and water scarcity, companies are devising new technical and operational strategies to reduce energy and water consumption – especially the ratio of water and energy usage to units of production. Savings derivable from such environmental resource conservation contribute to cost reduction, which invariably result in better financial performance. An improved financial performance would often resonate in improved dividend yield. Hence, this research evaluated the effect of water and energy reduction using a multinational beverage company – the Coca-Cola Company. Results from the paper's analysis show that Coca-Cola Company's strategy toward energy and water produces a beneficial financial result on dividend yield. This is shown by the significant P-value, which emerged on the test for the two hypotheses on water and energy reduction on dividend yield. The increase in dividend, which emerged from water and energy reduction during the period of analysis have a practical significance for

both Coca-Cola Company and for other beverage industries. Amongst others, one outstanding significance from the results is that a beverage company will benefit financially from environmental resource efficiency such as water and energy reduction. This research contributes to the literature by uniquely focussing on the interaction of these variables on dividend yield – a financial performance variable, which previous researchers on this concept have somewhat paid little attention in their studies. Therefore, this paper recommends that beverage companies should heighten their efforts toward environmental resource efficiency through water and energy reduction, as this will attract the support of shareholders when they visualise the beneficial effect on their dividend yield. The paper also recommends further research to use dividend yield as a dependent variable in studying the effect of energy and water reduction on financial performance; such future study may consider expanding the time series and perhaps inclusion of other companies related to the beverage industry.

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