Asian Journal of Economics, Business and Accounting

19(2): 48-57, 2020; Article no.AJEBA.61637
ISSN: 2456-639X

Effect of Environmental Protection Cost on Return on Equity of Petroleum Marketing Companies in Nigeria?

Abdulsalam Nasiru, Kaoje[1*], Sani, Idris[2], Mohammed Lawal, Danrimi[2], Shafiu Abubakar Kurfi[2] and Aminu, Abubakar[2]

[1]Department of Accounting, Usmanu Danfodiyo University, Sokoto, Nigeria.
[2]Department of Accounting, Umaru Musa Yar'adua University, Katsina, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJEBA/2020/v19i230302
Editor(s):
(1) Dr. Maria Ciurea, University of Petroșani, Romania.
Reviewers:
(1) Najeb Masoud, Aldar University College, UAE.
(2) Christopher Samuel, Mayanja Uganda Management Institute, Uganda.
Complete Peer review History: http://www.sdiarticle4.com/review-history/61637

Original Research Article

Received 29 July 2020
Accepted 05 October 2020
Published 18 November 2020

ABSTRACT

This paper evaluates the effect of environmental protection cost on return on equity of petroleum marketing companies in Nigeria. A panel data spanning a period of fifteen years from 2004-2018 was used, which was sourced from Nigerian Stock Exchange Factbook and annual account and report of twelve (12) petroleum marketing companies in Nigeria. Regression was used in testing the hypothesis of the paper. The paper found that environmental protection cost has positive and significant effect on return on asset of petroleum marketing companies in Nigeria. Therefore, the paper recommends that management of petroleum marketing companies in Nigeria should increase their participation on Environmental protection and Environmental remediation and pollution control to their host communities in order to maximized profitability most especially the return on asset of the sampled petroleum marketing companies in Nigeria.

Keywords: Environmental protection cost; return on equity and petroleum marketing companies in Nigeria.

**Corresponding author: E-mail: naskaoje@yahoo.com, kaoje73@gmail.com;*

1. INTRODUCTION

In Nigeria, oil pollution from spills, oil well blow-outs, oil ballast discharges and improper disposal of drilling mud from petroleum prospecting and other production wastes have resulted in environmental degradation problems. Evidently, there are significant loss of the aesthetic values of natural beaches due to unsightly oil spills; damage to marine wildlife, modification of the ecosystem through species elimination and the delay in biota [1] succession, and decrease in sea lives. It is against this background that a number of companies and other organizations are solidifying their environmental approaches and developing business activities that take the environment into consideration as environmental conservation efforts continues to increase.

Organizations have ranked business considerations based on profitability. Companies have also recognized all indirect expenditures as overheads without paying attention to the environment. Conventional accounting practice has not recognized environmental accounting for materials, water, energy and other natural resource usage. Similarly, conventional accounting has no provision for such practice. Scholars reveal that little is recognized of the environmental depletion and degradation to the environment. While others opine that it is not ethical having great corporate profits and material well-being if they come at the cost of large scale of the ecosystem by which we are nourished. It becomes clear that degradation, pollution and accelerated destruction of the ecosystem and the depletion of non-renewable environment biodiversity would soon become very dangerous to human existence (Charles, 2017)

Therefore, in the light of the background of increasing environmental attention, and the fact that petroleum marketing companies have profound production and marketing impact on the environment, this paper finds it deem to examine whether environmental protection cost has any significant impact on return on asset on petroleum marketing companies in Nigeria.

It is worthy to that being environmentally responsible involves cost and anything cost reduces profitability. More so, it is a two way affair, being environmentally compliant can either enhance performance or reduce profitability. There are agitations in the Niger Delta region for environmental reclamation based on land degradation, oil spillage, oil well blow-outs, oil ballast discharges and improper disposal of drilling mud from petroleum prospecting caused by oil producing companies which result in unemployment environmental pollution and so on in their community. This has made quoted petroleum marketing companies justifiable to be used as case study for this paper (Ahmed & Mousa, 2010; James & Ashamu, 2012).

The motivation for the study is hooked on the gap between the studies on environmental accounting disclosure and the effect of such disclosures on firm's financial performance in Nigeria McWilliams & Siegel, 2000; Cormier, Magnan & Velthoven, 2005; Chauhan & Kalola, 2014; Ihendinihu & Onyinyechi, [2]. Most of the previous studies used ROA, ROCE and ROE to measure performance but none combine ROA, ROE and NPV to measure financial performance. Furthermore, there are few studies that considered cost of Environmental disclosure, cost of environmental protection and environmental remediation and pollution control to peroxide Environmental Accounting. These factors have generated mixed results. Note that this paper used only one independent variable (ROE).

Therefore, there was need to examine the effect of environmental accounting on financial performance (return on equity) of petroleum marketing companies in Nigeria. The outcome of this paper will be of important to corporate organizations to adequately provide for environmental protection in their internal policies on investments and projects which impact on environment.

1.1 Research Questions

This study was guided with the below research question:

i. Does environmental protection cost have any significant effect on Return on Equity of Petroleum marketing companies in Nigeria?

1.2 Research Hypothesis

This paper test the following research hypothesis:

H_{01}: Environmental Protection cost does not have any significant effect on Return on Equity of Petroleum marketing companies in Nigeria.

1.3 Theoretical Framework

Several studies in developed and developing countries have necessitated the need for companies to disclose the effect of their activities on the environment using various theories such as stakeholder theory, legitimacy theory and social contract theory differently, but this paper used a stakeholder and legitimacy theory in assessing the authenticity of its usage on environmental disclosures.

1.3.1 Stakeholder's theory

According to Harrison and Freeman [3], a stakeholder is any individual or group whose role or relationship with an organization can help to define the organization concerning its mission, purpose or its goals vital to the development, functioning, survival and success or well-being of the organization and its services or it can be seen as anything that is affected by the organization and its activities.

Stakeholder's theory incorporates not only the investors, customers and suppliers but also governmental bodies, political groups, trade associated corporations, trade unions, communities, associated corporations, prospective employees, prospective customers and the general public at large. Therefore, giving attention to the domains of environmental activities by companies, improve the relations with their stakeholders that were identified, ultimately resulting in better overall financial performance [4].

Moreover, without stakeholder support and efforts, an organization cannot contribute to the value chain (Freeman & Liedtka, 1991); and as a result, the achievement of its objectives will remain unrealised as organisational performance is dependent on the determinants of stakeholder action i.e. stakeholder interests and identity.

Petroleum marketing companies in Nigeria can also play a vital role improving the relationship with their stakeholders. A petroleum marketing company can improve its financial performance, which will lead to increase in return on equity of shareholders.

1.3.2 Legitimacy theory

Legitimacy Theory is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" [5]. Legitimacy theory has become one of the most cited theories within the environmental accounting area since 1922 when it was propounded by Weber. Legitimacy theory offers a powerful mechanism for understanding intentional environmental disclosures made by companies, and its understanding provides a vehicle for engaging in critical public debate.

Legitimacy theory offers researchers, and the wider public, a way to critically discharge corporate disclosures. However, the understanding and study of the theory must become more refined, drawing on developments both within the accounting literature and beyond. It has given full potential of legitimacy theory for examining a wide range of disclosures realisation. The knowledge gained is used to provide better and more useful information to inform decision making by stakeholders. In this way, society is empowered to have greater control and oversight over the way resources are allocated [6].

Legitimacy theory implies that petroleum marketing companies get to adopt legitimizing actions like changing their sustainability disclosure practices (environmental accounting cost) when the society changes its values or its expectations of such organizations. (See for example Deegan, 2002; Faisal, Tower & Rumin, 2012).

2. LITERATURE

2.1 The Concept of Environmental Accounting

Environmental accounting can be defined as an umbrella term that describes various means by which companies disclose information on their environmental activities to users of financial statements [7]. It is also defined as those disclosures that relate to the impact company activities have on the physical or natural environment in which they operate (Wilmshurst & Frost 2000).

By disclosing environmental information, a company can protect its reputation and gain competitive advantages to enhance its ability to compete with other companies. Disclosing environmental information also increases a company's reputation and provides vital information to investors. Environmental performance evaluation is a systematic procedure that measures a company's compliance with environmental laws and regulations, such as, pollution management, ecological, and environmental protection systems. Environmental disclosure of companies can be categorized into four components (i.e. evidence, news type, location in report and environmental sub-themes) that provide insights into the extent and nature of the information disseminated [8].

2.1.1 Environmental accounting

Environmental accounting involves identification, evaluating, and allocation of conventional costs, environmental costs, and social costs to processes, products, activities, or budgets. Hansen and Mowen (2000) define environmental accounting as costs associated with the creation, detection, remediation and prevention of environmental degradation. Environmental accounting can also be defined as the management of environmental and economic performance through the development and implementation of appropriate environmental-related accounting systems and practices. While this may include reporting and auditing in some companies, environmental management accounting typically involves life-cycle costing, full-cost accounting, benefits assessments, and strategic planning for environmental management (International Federation of Accountants, [9].

2.1.2 Environmental reporting laws in Nigeria

Environmental Related Acts and Decree have been enacted in Nigeria before independence under different contexts by her colonial masters. These laws were scattered and uncoordinated as there was no fully organized institution to coordinate and discharge environmental related duties. In 1950s, the Criminal Code Act and Noxious Act were enacted to control odour and noise pollutions against neighbors. Later, the Public Health Acts were enacted aimed at vitiating the indiscriminate disposal of waste into the surrounding environment- especially water bodies, and its specific health goal was to reduce the spread of contagious diseases [10].

2.1.3 Effects of environmental cost on financial statement

Environmental cost can impact on financial statements prepared on a cash basis of accounting. However, the effects on the financial statements are more limited than that under financial statements prepared under an accrual basis [11]. According to Bela [12], environmental cost can impact on the cash flows of an entity during the reporting period. He further posited that, there could be an impact where compliance reporting is included in a government financial report. As such, entity would be required to demonstrate compliance with environmental laws and regulations.

2.1.4 Benefits of environmental accounting

The benefits of understanding an environmental accounting initiative is that the identification and greater awareness of environment related costs often provides the opportunity to find ways to reduce or avoid these costs, whilst also improving environmental performance [13,14,15]. Richardson [16] identifies that, more elaborately, environmental accounting is an effective tool for placing environmental issues strongly on top management agenda, providing useful data to inform environmental and financial manager's decision-making, and concretely demonstrating environmental commitment to stakeholders.

2.1.5 Firm financial performance

Financial performance which assesses the fulfillment of a firm's economic goals has long being an issue of interest in managerial researches. Firm financial performance relates to the various subjective measures of how well a firm uses its assets in its primary operation to generate profit. Kothari [17] defines the value of a firm as the present value of the expected future cash flows after adjusting for risk at an appropriate rate of return. It is the success in meeting pre-defined objectives, targets and goal within a specified time target [18]. For the purpose of his paper return on equity was used as a performance measurement variable.

2.1.6 Return on equity ratio

This ratio indicates the margin available for the shareholders after satisfying all other obligations and taxes as well. Return on equity measures the degree of profitability to shareholders the firm after expenses and taxes are paid (Van Horne and Wachowicz, 2005). It measures how much a shareholder is earning as profit after tax for each amount invested in the firm. In other words, return on equity indicates the net earnings per equity capital invested. (Samad and Hassan

2000). It is regarded as an indicator of evaluating managerial efficiency. It is assumed that the higher return on equity the better managerial performance and a vice versa; But however, a higher return on equity may be as a result of debt capital (Financial leverage) or as a result of higher returns on assets (Ross, Westerfield and Jaffe 2005). Usually there is higher return on Earnings per Share Ratio: equity for higher growing companies. ROE is expressed as:

ROE = Net Profit after Tax / Shareholders' Equity X 100

2.2 Empirical Review

Wagner [19] assesses the relationship between the independent variables (pollution abatement and other environment-related information) and the dependent variables (return on assets (ROA) and return on equity (ROE). Strong relationship between both variables and the value is positive, thus indicating a perfect positive correlation between pollution abatement and other environment-related information and ROA. Environmental disclosure is found to have a positive and significant association with a company's financial performance. This shows that environmental disclosure is associated with the company's performance (ROA) is accepted.

Yusuf [20] studies the increase in global environmental awareness and the campaign for sustainable economic development is redirecting the attention of firms towards environmental sensitivity in multinational oil companies in Nigeria. Large amount of world's energy are extracted but treat the indigenous residents with neglect and sense of no responsibility as claimed by oil producing communities. Therefore, the study examines the effect of environmental responsibility on the performance of quoted Nigerian oil companies. Correlational research design is adopted using multiple regressions as tools of analysis for the study. The result reveals that environmental responsibility has significant effect on the performance of quoted oil companies in Nigeria. It is therefore recommended that the management of oil companies should increase charitable contribution among others to their host community.

Beredugo and Mefor [21] evaluate the relationship between environmental accounting and reporting and sustainable development in Nigeria. Pearson correlation coefficient and OLS are used for data analyses, and is discovered that there is a significant relationship between environmental accounting and reporting and sustainable development; that environmental accounting encourages organizations to track their GHG emissions and other environmental data against reduction targets, and there are consequences for noncompliance with environment.

Armaya'u [22] examines the impact of environmental responsibility and performance of quoted companies in Nigeria for the period 2002-2006. The study employs three independent variables namely: Employee Health and Safety (EHS), Employee Welfare and Social Benefit (EWSB), and Donations and Charitable Contributions (DCC) in explaining the environmental accounting disclosure and financial performance relationship in quoted oil companies in Nigeria. The study further disaggregates the effect of the various aspects of environmental accounting on firm's performance which was measured by Return on Assets (ROA). Correlational research design is adopted using multiple regressions as tool of analysis; the result reveals that environmental responsibility has significant impact on the performance of quoted oil companies in Nigeria.

3. METHODOLOGY

3.1 Research Design and Model Specification

3.1.1 Research design

This paper adopts Correlational Ex-post factor Design. The design is considered most appropriate because it describes the relationship between two or more variables. The design helps to investigate possible cause and effect relationship. The population of the study consisted of all the twelve (12) petroleum marketing companies quoted on the floor of the Nigerian Stock Exchange as at 31^{st} December, 2018 (See Appendix II & III). While only eight petroleum marketing companies were used as sample. Secondary source of data was adopted using financial statement to illicit all the data. Regression model was also used in testing the hypothesis of this paper.

3.1.2 Model specification

The model for this paper is specified as follows:

$$PRF = f\,(ENVAC)$$

Where:

PRF = Financial Performance
ENVAC = Environmental Accounting

Enahoro [23] model was adapted with modification for this study.

$$ROE_{it} = \alpha + \beta_1 EPC_{it} + \beta_2 ERPC_{it} + \beta_3 FSIZC_{it} + \mu_{it} \quad (1)$$

Where:

ROE = Return on Equity i at time t
EPC = Environmental Protection Cost
ERPC = Environmental Remediation and Pollution Control
FSIZ = Firm Size
μ_{it} = Total error term

β_1, β_2, β_3 represent intercept.

A priori expectation is that $\beta_1 – \beta_3 > 0$

Decision rule; null hypothesis is rejected if the probability (p-value) is < 5% significance level, otherwise it is accepted.

4. SUMMARY OF FINDINGS

The findings from test of hypothesis that "Environmental Protection cost does not have any significant effect on Return on Equity of Petroleum marketing companies in Nigeria" revealed that the a significant p-value of 0.0036 (See Appendix I) indicating the rejection of the null hypothesis in favor of alternate hypothesis which states that Environmental Protection Cost has a significant effect on Return on Equity of Petroleum marketing companies in Nigeria. This validates the Legitimacy theory which offers a powerful mechanism for understanding intentional environmental disclosures made by companies, and its understanding provides a vehicle for engaging in critical public debate.

This finding is in agreement to the study of Onyinyechi and Ihendinihu [2], who affirm that environmental protection cost has statistically significant relationship with corporate performance. Similarly, Shehu (2015), states that environmental protection cost plays a significant role on the profitability of conglomerates in Nigeria. However this finding contradicts the findings of Enahoro [23], who suggests that environmental protection cost does not have significant effect on the financial performance of petroleum marketing companies.

5. CONCLUDING REMARKS

Based on the findings of test of hypothesis, the study concluded that environmental accounting cost has significant effect on return on equity of petroleum marketing companies in Nigeria. This could be as a result of cost implementation enforcement committee as well as strong support from the top management. Environmental accounting cost also improves the level of performance of companies (see for example Beredugo and Mefor, [21]).

6. RECOMMENDATIONS

Following from the conclusion that Environmental accounting cost has significant effects on return on equity of petroleum marketing companies in Nigeria, for the period under review, the study recommends the following.

i. Management of petroleum marketing companies should increase their participation in environmental protection to their host communities in order to guarantee reasonable increase in financial performance.
ii. Management of petroleum marketing companies should develop a positive disposition towards Environmental pollution control friendly practice in order to restore and guarantee stable and smooth operations which will in turn improve performance of their respective companies and employees.
iii. Petroleum marketing companies should formulate and implement consistent environmental policies like immediate removal of pollution or contaminants from the environment, community safety to enhance their competiveness.

7. SUGGESTION FOR FURTHER RESEARCH

This study investigates the effects of environmental accounting on financial performance of selected quoted petroleum marketing companies in Nigerian. Future research should address the contribution of other variables such as Environmental Capital Expenditure, Cost of Environmental Law Compliance (CELC), Environmental Internal

Failure costs and Environmental External Failure cost in both the petroleum marketing companies operating in Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fauna, Flora International. Action plan for implementing co-management in the Bawangling Nationa nature reserve and adjacent communities in qingsong township. Fauna and Flora International, China Programe Office, Beijin. 2005;I.
2. Onyinyechi OC, Ihendinihu JU. Impact of environmental and corporate social responsibility accounting on organizational financial performance: Evidence from selected listed firms in Nigeria stock exchange. Journal of Emerging Trends in Economics and Management Sciences. 2016;7(5):291-306.
3. Harrison JS, Freeman RE. Stakeholders, social responsibility, and performance: Empirical evidence and theoretical perspectives. Academy of Management Journal. 1999;42:479-485.
4. Waddock S, Graves S. The corporate social performance financial performance link. Strategic Management Journal. 1997; 18:303-319.
   Available:http://dx.doi.org/10.1002/(SICI)1097-0266(199704)18:4<303::AID-SMJ869>3.0.CO;2-G.
5. Suchman MC. Managing legitimacy: Strategic and institutional approaches. Academic of Management Journal. 1995; 20(3):571-610.
6. Matthews MR. Socially Responsible Accounting, London, U.K; Chapman and Hall; 2004.
7. Alok KP, Nikhil CS, Bhagaban D. Environmental accounting and reporting with special reference to India. Munich Personal RePEc Archive (MPRA) Paper No. 7712; 2008.
   Available:http://mpra.ub.uni-muenchen.de/7712/
8. Mokhtar, Nik Meriam Sulaiman. Waste quantification models for estimation of construction and demolition waste generation: A review. International Journal of Global Environmental Issues, Inderscience Enterprises Ltd. 2012; 12(2/3/4):269-281.
9. IFAC. Financial and management accountants committee report, environmental management in organisations. The Role of Management Accounting, Issued by the International Federation of Accountants. Impact on the performance of large UK public companies. Journal of Business Finance and Accounting. 2005; 29(5):579-611.
10. Chokor BA. The identification, promotion and preservation of natural and cultural land scape for Tourism. Benin-City: Environment and Behavior; 1993.
11. Bassey EB, Effiok SO, Okon EE. The Impact of Environmental Accounting and; 2013.
12. Bela AR. A study of corporate social disclosure in Bangladesh. Managerial Auditing Journal. 2004;16(5):274-281.
13. William MS. Voluntary environmental and social accounting disclosure practices in the Asia-pacific region: An international empirical test of political economy theory, The international Journal of Accounting. 1999;34(2):209-214.
14. Tapany AT, Bassey BE, Bessong PK. Environmental Activities and its implications on the profitability of oil companies in Nigeria. International Journal of Physical and Social Sciences. 2012; 2(3):285–302.
15. Tilt CA. The influence of external pressure groups on corporate social disclosure. Accounting Auditing & Accountability Journal. 1994;1(7):1-4.
16. Richardson M. Environmental accounting: An effective tool for environmental issues. Journal of Accounting, Organizations and Society. 1999;24(1):156-186.
17. Kothari U. Power, knowledge and social control in participatory development, in: B Cooke & U Kothari (eds), Participation: The New Tyranny? (London: Zed Books). 2001;139–152.
18. Eyenubo AS. The impact of bigger board size on financial performance for firms: The Nigerian experience. Journal of Research in International Business and Management. 2013;3(3):85-90.
19. Wagner, et al. Kinetic and structural analysis of active site mutants of monofunctional NAD-dependent 510-methylenetetrahydrofolate dehydrogenase from Saccharomyces cerevisiae. Biochemistry. 2005;44(39):13163-71.

20. Yusuf A. Environmental responsibility and performance of quoted oil companies in Nigeria. A research work presented to the Department of Accounting Ahmadu Bello University, Zaria in partial fulfillment of the requirement for the award of M.Sc accounting and finance degree; 2011. Available:www.iscopub.ng
21. Beredugo SB, Mefor IP. The impact of environmental Accounting and reporting on Sustainable development in Nigeria. Journal of Finance and Accounting. 2012; 3(7):55-63.
22. Armaya'u Y. Environmental responsibility and performance of quoted oil companies in Nigeria, 1-73, Being A Research Work Presented To The Department Of Accounting Ahmadu Bello University, Unpublished; 2011.
23. Enahoro JA. Design and bases of environmental accounting in oil & gas and manufacturing sectors in Nigeria. An Unpublished Ph.D. Thesis submitted to the Department of Accounting, Covenant University Ota, Nigeria; 2009.

APPENDICES

Appendix I

Panel Regression Analysis

Fixed Effects Regression
Dependent Variable: LROE
Method: Panel Least Squares
Date: 09/10/19 Time: 17:16
Sample: 2004 2018
Periods included: 15
0.872469** 0.497622 0.0036
Total panel (unbalanced) observations: 107

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LERPC	0.176626	0.294725	0.599291	0.5504
LEPC	0.872469	0.49622	0.851121	0.0036
LFIZ	6.566663	1.491003	4.404193	0.0000
C	7.398039	10.55585	0.700847	0.4851
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.486147	Mean dependent var		2.917455
Adjusted R-squared	0.432621	S.D. dependent var		1.127088
S.E. of regression	0.848974	Akaike info criterion		2.607551
Sum squared resid	69.19268	Schwarz criterion		2.882328
Log likelihood	-128.5040	Hannan-Quinn criter.		2.718942
F-statistic	9.082389	Durbin-Watson stat		1.133006
Prob(F-statistic)	0.000000			

Appendix II

Population of the study

S/N	Firm	Status of companies	Year of incorporation	Year of listing
1	Conoil Plc	Listed	1960	1989
2	Eternal O & G Plc	Listed	1989	1998
3	Forte Oil Plc	Listed	1964	1978
4	Japaul Oil Plc.	Listed	1994	2005
5	Mobil Oil Nig. Plc	Listed	1951	1979
6	MRS Oil Nig. Plc	Listed	1969	1978
7	Oando Plc	Listed	1962	1992
8	Total Nigeria Plc	Listed	1956	1979
9	Beco Petroleum Plc	-	1986	2009
10	Capital Oil Plc	-	1985	1990
11	Rak Unity Pet. Comp Plc	-	1982	1989
12	Sepalat Pet. Comp Plc	-	2009	2013

Source: Nigerian Stock Exchange, (2018)

Appendix III

List of sample companies

S/N	Firm	Status	Year of Incp.	Year of Listing	Total Asset '000	Total revenue '000
1	Conoil Plc	Listed	1960	1989	67,673,419	75,838,154
2	Eterna Oil & Gas Plc	Listed	1989	1998	53,136,461	251,877,933
3	Forte Oil Plc	Listed	1964	1978	152,580,674	32,985,578
4	Japaul Oil & Maritime Service Plc	Listed	1994	2005	25,601,189	363,508
5	Mobil Oil Nigeria Plc	Listed	1951	1979	70,660,798	164,609,535
6	MRS Oil Nigeria Plc	Listed	1969	1978	54,283,202	89,552,819
7	Oando Plc	Listed	1962	1992	1,075,110,435	679,465,339
8	Total Nigeria Plc	Listed	1956	1979	132,900,830	156,268,519

Source: Nigerian Stock Exchange, (2018)

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/61637