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Article

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Firm Characteristics and Environmental Disclosure in an Extractive Industry in Tanzania

Ntui Ponsian Prot[1], Siasa Mzenzi[2] and Henry Chalu[3]

ABSTRACT

This study investigates the influence of firm characteristics on environmental disclosure in an extractive industry in Tanzania. The study applies legitimacy theory as the foundation for theoretical perspective. The study uses the panel data of 18 firms from 2004 to 2018 as reported in Tanzania Extractive Industry Transparency Initiative (TEITI). Data was extracted from annual reports, and a Random Effects General Least Square (GLS) regression analysis model was used for analysis. The results show that firm age, firm size, capital structure, and firm and ownership structure are significant factors that positively influence environmental disclosure. This indicates that older firms, large firms, high leveraged and firms owned by more block shareholders disclose more environmental information. However, although firm type and firm profitability factors seem to influence environmental disclosure, they are insignificant. The results help firms' management to improve their levels of environmental disclosure, participate in environmental activities as social citizens and also ensure that they disclose more environmental information for all users to access. Regulators and policy makers could use these results to design taxation incentives with firms which are the best disclosers, or use environmental disclosure as an indicator to design public tendering system and standard setting, which may improve the current low disclosure.

Key words: *Firm Characteristics, Environmental Disclosure, Extractive Industry, Legitimacy Theory, Tanzania*

INTRODUCTION

This paper explores the influence of firm characteristics (FCs) on the environmental disclosure in Tanzania by addressing the main question 'What is the influence of internal components of the firms on the extent of environmental disclosure?' This question is important because Tanzania, like many other countries, is one of the members of the Rio de Janeiro declaration of 1992 and the Paris Accord of 2015 that link sustainable development and public access to environmental information in achieving sustainable development, provided for by principle 10 of the Rio Declaration (UN DESA, 1992; UN, 2015).

This study is considered important for the following reasons: Firstly, knowledge about internal components of the firms that influence environmental disclosure helps the formation of regulations and policies, so that generalization to all firms of all sizes, age and other variations is avoided. Secondly, environmental disclosure by the firm helps firms' management, regulators and policy makers, to make environmental decisions, and to prepare regulations and policies that will protect the environment respectively. Thirdly, environmental disclosure is an indicator that the firm is a responsible citizen of the large society, which recognizes how firms work in line with their interest

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and environmental protection, and takes measures where necessary in regulating the actions or behavior of firms.

Another importance of this research is based on reforms which have been made in Tanzania, as described by Kessy et al. (2017), who show that recent developments in the Tanzanian extractive industry have led to debates about the best practices to manage the sector and to address the effects of mining projects upon communities. TEITI (2018) shows that in order to manage natural resources, Tanzania passed three laws in 2017, the Natural Wealth and Resources (Permanent Sovereignty) Act, 2017, the Natural Wealth and Resources Contracts (Review and Re-Negotiation of Unconscionable Terms) Act, 2017, and the Written Laws (Miscellaneous Amendments) Act 2017), introducing substantial changes in the extractive sector. Section 47 of the Petroleum Act 2015, requires, among other things, transparency, sustainability and care for the environment. *All these reforms have strong disclosure implications which can be addressed by* environmental disclosure. *However, the efforts* made to manage natural resources and the environment may not be sufficient, falling short of how they are addressed in financial reporting as a major tool for communication with all stakeholders to ensure transparency, sustainability and care for the environment.

To link with the objective of this study in Tanzania, the National Environmental Management Council (NEMC) fined gold mines for the environmental pollution that threatens biodiversity and human health (Citizen Correspondent, 2013). Also, in the Tanzanian context there are environmental concerns regarding manufacturing, mining, oil and gas firms and the recently established national projects i.e. the Mtwara-Dar Es Salaam gas pipeline, the Hoima-Uganda to Tanga-Tanzania oil pipeline and the Mwalimu Nyerere Hydroelectric Power project, which need more environmental disclosure so that they benefit both people and the environment. While the damage is most visible in the mining, oil and gas or extractive industry, most firms disclose little information in their annual reports, while others disclose none, which makes it difficult for stakeholders to get information for decision making, since environmental disclosure is voluntary, as evidenced by the absence of regulations or policies (i.e. Environmental Management Policy and its Act, Petroleum, Gas and Mining Reforms) and standards (i.e. International Accounting Standards, International Financial Reporting Standards) to mandate environmental disclosure in Tanzania. The regulation focuses on physical, live or onsite audit but fails to include environmental accounting, environmental disclosure and reporting in firms' or projects' financial and annual reports or statements, so that both activities and operations onsite and reports are audited.

It is also of value to know what influences environmental disclosure, as investors view disclosure as a cause of social and political costs exposures, (Sankara et al., 2019). Further, Arena et al. (2018) show that mandatory reporters show lower levels of disclosure than voluntary reporters. Environmental practices continue to harm the earth, mostly caused by human activities (Lumbanga, 2018). Firms' operations, including those of the extractive industry (mining, oil and gas), cause damage to the environment whereby deforestation, climate change and pollution threaten the lives of people and biodiversity (Citizen, 2013; Lumbanga, 2018). In this situation, where damage is caused and disclosure is still very low, a study on environmental disclosure and what influences the same is justified.

Environmental disclosure has attracted a number of studies across the globe; however, limited studies have been conducted in developing countries as well as not having focused on the internal components of the firm which are under the firm's control and also comprising part of the firm's

internal environment, which together comprise the visible firm (Zou & Stan, 1998). O'Connor (2006) shows that environmental accounting and disclosure research in developing countries is still scarce, as Africa has only 3/240 environmental accounting studies, followed by the Middle East having only 1/240, indicating that other countries (developed) have done much more, i.e. USA 61/240, UK 35/240, EU's non-UK 30/240, and Australia 38/240**.** Even in the few developing countries doing research on environmental disclosure, it is worth noting that there are differences in environmental disclosure and that the overall disclosure is still low. For example, the Arab countries, despite having oil wealth and control of approximately 77% of global oil reserves, still suffer from sparse research in this area (Kamal et al., 2012), which is consistent with Beske et al. (2020), who indicate that firms disclose only small amounts of information related to sustainability, and with integrated reports. Kamal (2015), shows that environmental disclosure varies with economic conditions and government regulations, while changes in regimes also influence political policy changes and environmental accounting in general. This suggests that environmental disclosure factors may differ from country to country, as the regulatory context influences disclosure decisions (Mateo-Márquez et al., 2019). In addition, Parvez et al. (2019) show that greenhouse gas (GHG) information is outdated, incomplete, inconsistent, inaccurate and incomparable and, therefore, to meet user expectations, improvement is needed in raising the question of what pushes firms to disclose environmental information.

The scarcity of environmental disclosure research in developing countries may imply that environmental problems are not significant, but there are many problems, ranging from the effects on biodiversity on human health, as shown in the Shell oil spills in Nigeria. Specifically, in 1997, there were 254 oil spills and 76,000 barrels, in 1998, 242 oil spills and 50,200 barrels and in 1999, 319 oil spills and 23,377 barrels (Enahoro, 2009). Taking this experience of the mining sector, the infant oil and gas sector also calls for scrutiny (Environmental Benchmark Consulting Engineers, 2014). Since regulatory context influences disclosure decisions (Mateo-Márquez et al., 2019), it is, therefore, of interest to identify the factors influencing firms to disclose environmental activities, in a situation where regulations and laws are vague and disclosure is mostly voluntary. Radhouane et al. (2020) show that provision or disclosure of external assurance by environmentally sensitive firms is destructive. In addition, the situation is such that there is limited knowledge regarding integrated reports among the preparers of the reports, and they are also reluctant to implement it, although they see the benefit of it (Adharian & Villiers, 2019).

The paucity of research in developing countries, including Tanzania, as hinted at by O'Connor (2006), and Kamal et al. (2012) calls for more research, as studies to date have given mixed results. They show what influences environmental disclosure, but there are many inconsistencies, which justifies a study that incorporates other countries' and industries' environmental activities, to reflect a more comprehensive measure of environmental disclosure. The main reasons cited for inconsistencies are methodological, theoretical and geographical. Parvez et al. (2019) add that the information obtained in the cities is outdated, incomplete, inconsistent, inaccurate and incomparable. As environmental disclosure is voluntary and the decision to disclose is internal to the firm, it is important to find what internally pushes firms to disclose environmental information. This study focuses on components of the firm's internal environment and identifies which ones influence environmental disclosure in an extractive industry in Tanzania.

The rest of the paper is structured into the following sections: Next Section provides a review of the literature and theoretical background, followed by a section outlining the research

methodology. In the last two sections; one gives the analysis and interpretation of the research findings and the last section contains the discussion and conclusions.

LITERATURE REVIEW

This study applies legitimacy theory to build variables and interpret results, because firm characteristics are internal to the firms; most of them are visible or physical and generally form an image of the firms in such a way that they have to be used to achieve a good image within society. Since environmental information is beneficial and needed by many stakeholders in society, and since any damage to the environment affects society both directly or indirectly, it is assumed, in this context that firms disclose environmental information so that they can be seen as good citizens and that they are working in line with the societal objectives. Dowling and Pfeffer (1975) define legitimacy theory as the condition or status which exists when an entity's value system is congruent with the value system of the larger social system of which the entity is a part, and any disparity, actual or potential, between the two when the value system is a threat to the entity's legitimacy. There are various remedial actions that firms may adopt in reacting to legitimacy concerns, and public disclosure of information in places such as annual reports can be employed by a firm to implement a communication strategy between an entity and society (Dowling & Pfeffer, 1975; Gray et al., 1995).

Legitimacy theory links firms' goals with societal objectives and it is assumed that firms position themselves to be seen as good citizens and work in line with community interests. The theory specifically states that organizations are expected to act in a socially responsible and acceptable manner, so as to access benefits and resources, for their goals and place in the society to be approved, and to be assured of continued existence (Guthrie & Parker, 1989). Many researchers (Ball & Craig, 2010; Cho, 2009; Cho & Patten, 2007; Patten, 2015) reinforce the argument that firms voluntarily disclose environmental information to gain legitimacy. In support of legitimacy theory, Patten and Grampton (2004) indicate that proponents of legitimacy theory argue that firms use social and environmental disclosure as a tool for participating in, and responding to, the public policy process and that firm's use disclosure as a tool for seeking social legitimacy. At the same time, Tadros and Magnan (2019) argue that legitimacy and economic factors influence environmental and sustainability disclosure decisions. Legitimacy theory focuses on disclosure (Ball & Craig, 2010; Cho, 2009; Cho & Patten, 2007; Patten, 2015), improved firm image (Deegan, 2009) and shows that internal strategies used by managers do influence disclosure (Suchman, 1995; Wang'ombe, 2013). Thus, it can be better than other theories to be used to identify, build variables and interpret firm characteristics, that is, firm profitability, ownership structure, firm size, firm type, and capital structure, which are internal to the firms, and firms can voluntarily use them as tools for environmental disclosure strategy. Although the theory has been used widely, and is the most cited theory (Campbell, 2003) to identify, build variables and explain results in environmental reporting, the ability to directly measure legitimacy is questionable (Wang'ombe, 2013).

Hypotheses Development

Various studies (Ahmadi & Bouri, 2017; Al-Shaer et al., 2017; Bowrin, 2013; Chandok & Singh, 2017; Chaklader & Gulati, 2015; Cho et al.,2012; Dienes et al., 2016; Djuminah et al., 2017; Haddad et al., 2017; Kolsi, 2017; Mimi & Carol, 2006; Ribeiro & Guzman, 2010; Rizk et al., 2008; Said et al., 2013; Smith et al., 2007) have attempted to identify a number of firm characteristics. As a result, the literature is full of them, specifically, firm age, firm size, type of firm or industry, capital structure, profitability, ownership structure, organization culture, systematic risks, liquidity

level and foreign influence. From the summary of previous studies, this study focuses on firm age, firm size, type of firm or industry, capital structure, profitability and ownership structure, which seem to be the most used variables in the literature, as determinants for environmental disclosure; they are also objectively and quantifiable measures easily found in the annual reports of firms. Firm characteristics have an influence on company environmental disclosure, although they differ from country to country and industry to industry. More details of each firm characteristic are given below.

Firm Age

According to Chandok and Singh (2017), firm age is positively associated with the level of environmental disclosure, which means that older firms report more environmental issues. This may be due to political pressure, or experience and fear of non-disclosure costs which may have happened previously in the life of the firm. Lodhia et al. (2012) and Mucciaroni (2012) show that there is a strong relationship between firm age and environmental disclosure, while the study by Dienes et al. (2016) concludes that firm age does not show a clear tendency in environmental disclosure. Although Dienes et al. (2016) are indifferent generally to the legitimacy theory perspective; their study shows that older firms report more environmental issues to please stakeholders and to avoid the expenses incurred by previous non-reporting. From the legitimacy perspective, the older firms disclose more to protect the legitimacy they have achieved. This derives to hypothesize that:

H1: Firm age positively influences environmental disclosure.

(i) Firm Size

Shuchi (2009) provides strong evidence in support of the influence of firm size and environmental performance, and the study by Dienes et al. (2016) indicates that firm size is among the most important drivers of the disclosure of sustainability reports. On the other hand, Chandok and Singh (2017) state that environmental disclosure on the firm's website and overall disclosure has association with company size and systematic risk, while Haddad et al. (2017) observe that firm size has always affected the level of environmental disclosure. Several studies (Ahmadi & Bouri, 2017; Andrikopoulos et al., 2014; Bowrin, 2013; Drobetz et al., 2014; Karaman et al., 2018; Khan, 2010; Khasharmeh & Suwaidan, 2010; Rouf, 2011; Shamil et al., 2014; Sharif & Rashid, 2014; Vitezi´c et al., 2012; Wang et al., 2013) show that there is a positive relation between firm size and environmental disclosure. They indicate that large firms disclose more environmental information so that they can inform the community and society that they care about the environment.

In contrast to other studies, Marquis and Qian (2014) and Shamil et al. (2014) found a negative correlation for firm size and corporate social responsibility (CSR) disclosure, while Kolsi (2017) shows that firm size does not have any impact on the level of disclosure adopted. The support for firm size being positively associated with environmental disclosure may be because firms with increased vulnerability, due to their size, disclose more information voluntarily as a means of managing legitimacy, especially firms operating in industries with a high environmental footprint, such as oil and gas, and mining. They may adopt substantive environmental actions, whereby environmental legitimacy can be achieved by increasing environmental disclosures (Kuo & Yi-Ju Chen, 2013). Although there are mixed results, by using legitimacy theory, the large firms disclose more in order to manage the firm's positive image, leading to the next hypotheses that:

H2: Firm size positively influences environmental disclosure.

(ii) Firm Type

The study by Shuchi (2009) provides strong evidence in support of the influence of type of industry and environmental performance, Bowrin (2013) as well as Liu and Anbumozhi (2009) show that the amount of environmental disclosure is positively related to industry affiliation. Said et al. (2013) reveal that there is a significant relationship between industry type and the extent of environmental disclosure, this being the most significant variable in Malaysian public listed firms.

In support of the industry type argument, Galani et al. (2012) show that firms from environmentally sensitive industries disclose more than less polluting firms, while at the same time Hassan and Guo (2017) confirm that firms in the carbon-intensive industry use standalone environmental reports to pose as good corporate citizens, even when they are not. In contrast, Yusoff et al. (2006) find no such industry effect, with firms with increased vulnerability, due to their industry, disclosing more information voluntarily as a means to managing legitimacy. This means that firms operating in industries with a high environmental footprint, such as oil and gas, and mining have no effect on environmental disclosure (Kuo &Yi-Ju Chen, 2013).

Although Yusoff et al. (2006) find no effect of firm type on environmental disclosure, in this context it is assumed that firms operating in the exploration stage (upstream) are less polluting than firms in sales and distribution (downstream). Using the legitimacy theory perspective, firms operating in downstream may find themselves needing to disclose more, based on the nature of their activities, as they are considered to be more polluting, as the level of sensitivity to the environment influences the extent of environmental disclosure. Therefore, downstream firms disclose more to show that they are good citizens and that their objectives are in line with society. In this context it is hypothesized that:

> *H3: Firms involved in downstream operations, positively influences environmental disclosure.*

(iii) Capital Structure

Some studies, such as Andrikopoulos et al. (2014), Christopher and Filipovic (2008), Li et al. (2013) as well as Sharif and Rashid (2014), find that environmental disclosure is positively related to financial leverage. On other hand, Ahmadi and Bouri (2017) and Dienes et al. (2016) show that financial attributes (the need for capital and capital spending) are positively associated with environmental disclosure quality. Also, Karaman et al. (2018) shows capital structure is positively and significantly associated with sustainability reporting. In contrast, Drobetz et al. (2014) observed a significant negative relationship.

According to Kolsi (2017), the leverage ratio does not have any impact on the level of disclosure, while Bowrin (2013) indicates that the importance of public equity financing is not statistically related to environmental disclosure comprehensiveness. However, Chandok and Singh (2017) did not show a clear tendency to affect environmental disclosure, but indicated that environmental disclosure on the website and overall disclosure has an association with leverage. On the other hand, Dilling (2010), Khasharmeh and Suwaidan (2010) show that neither recently incorporated equity and debt, nor the debt ratio, are significant, while other studies (Bowrin, 2013; Chandok & Singh, 2017) find that there is an association, though not significant. Generally, results indicate that firms which are highly geared report highly about

environmental issues to show that they are good citizens and to avoid more environmental liabilities, in line with legitimacy theory. These results derive us to hypothesize that*:*

H4: Leverage positively influence on environmental disclosure.

(iv) Firm Profitability

Kolsi (2017) and Aljifri et al. (2012) argue that firm profitability is a significant determinant of corporate disclosure policy, while other studies (Ahmadi & Bouri, 2017; Li et al., 2013; Marquis & Qian, 2014; Sharif & Rashid, 2014; Vitezic et al., 2012) show a positive relationship between firm profitability and social and environmental disclosure. In contrast, Bowrin (2013) and Dienes et al. (2016) find no relationship between firm profitability and disclosure. Further studies such as Andrikopoulos et al. (2014) and Michelon (2011) report that an association between a firm's profitability and its level of environmental disclosure does not exist, while Nor et al. (2015) did not find any significant relation between environmental disclosure and firm profitability.

Other studies (Andrikopoulos et al., 2014; Chandok & Singh, 2017; Li et al., 2013; Michelon & Parbonetti, 2012) provide negative effects of a firm's profitability on its environmental disclosure. They indicate that high profit or financially performing firms disclose less environmental information, which may imply that they cut environmental reporting expenses to improve their bottom line. Since the more profitable firms have greater financial resources to fund disclosure, they can be expected to be more willing to assume the additional costs of producing and publishing a sustainability report (Gamerschlag et al., 2011), and a company's profitability can affect the quantity of sustainability reporting, both positively and negatively. Using the legitimacy theory perspective, the study predicts that profitable firms report more about environmental issues in order to be seen as good citizens and to avoid political and compliance pressure. This derives us to the hypothesis that*:*

H5: Firm profitability positively influences environmental disclosure.

(v) Ownership Structure

To show how ownership structure influences environmental disclosure, Dienes et al. (2016), state that ownership structure is the most important driver of the disclosure of sustainability reports; Kolsi (2017), Gamerschlag et al. (2011) and Shan (2009) show that disclosures are inversely related to ownership concentration, in line with Aljifri et al. (2012), who find a positive relationship between disclosure and block holders who own 5-10% and Karaman et al. (2018), who show that ownership structure is negatively and significantly associated with sustainability reporting.

Moreover, Christopher and Filipovic (2008) and Li et al. (2013) find a significant positive relationship between CSR disclosure and the percentage of ordinary shares that are held by shareholders other than the top 20, the top 10 and the top 5 shareholders. Furthermore, Drobetz et al. (2014) and Gamerschlag et al. (2011) show a positive association for the percentage of shares held by the largest shareholder and for the free float. However, there are studies (Kolsi, 2017; Nurhayati et al., 2016; Khasharmeh & Suwaidan, 2010; Vitezic et al., 2012) which found contrary results, that no significant relationship or influence was found between level of ownership and environmental disclosure.

This trend indicates that, in legitimacy theory, firms with fewer block holders or many other public shareholders, disclose more environmental issues to show that the interests of other

shareholders are protected and that the firms take care of them, even beyond dividends, and also that they are operating in line with society as a whole. It is therefore hypothesized that:

H6: Ownership of shares concentration negatively influences environmental disclosure.

RESEARCH METHODOLOGY

The study involved a sample of 18 firms in the industry (from the population of 1,287) which met the materiality threshold as per TEITI 2017 and 2018 reports and disclosed their annual reports which were available online for data collection. The qualified firms altogether rendered a total of 216 annual reports or observations, as some firms were younger and were not in operation in 2004, with fewer years in operation. The remaining 1,269 firms were considered to be smaller, individually based and not able to disclose significant information in their annual reports, while 37 firms, although they met the materiality threshold, did not disclose or show their annual reports on their websites. The reports for data collection were annual reports from 2004, when the Environmental Management Act was enacted, to 2018, the year with the most recent annual reports, making an unbalanced panel data of not more than 15 years of observations for each firm. In addition, with effect from 1st July 2004, IASs were officially adopted in Tanzania, which again may have changed the behavior of firms in their financial disclosures.

Data was collected from the annual reports of the firms in order to collect the values of all independent variables and the dependent variable. A checklist of all firm characteristics' factors and disclosure scores was used to collect data, informed by the body of literature and GRI guidelines. The annual reports were used to collect data because they are a relevant source of information in environmental disclosure that are open and allow on-going public scrutiny, and that their contents have to be formally reviewed and approved by the governing board (Chong & Rahman, 2020; Savage, 2000; Adams et al., 1998; Ntim et al., 2017; Coy et al., 2011).

The values of the firm characteristics (firm size, firm profitability, capital structure, ownership structure) were extracted from the statements of financial position and the income statements of the annual reports, while firm age and firm type were available in firms' profiles. The disclosure score, or environmental disclosure index, as a measure of environmental disclosure was established. In this study, a list of 20 environmental themes was used, with a disclosure score, whereby 3 scores are assigned to a company for the item disclosed in money terms, 2 scores assigned if the information is given in quantitative terms, 1 score if the information is given in descriptive terms and 0 score for no disclosure, using experience from previous studies such as (GRI, 2011; GRI, 2006; Beck et al., 2010; Kamal et al., 2012; Eltaib, 2012; Ullah et al., 2014).

Model Specification and Data Analysis

The Pesaran test was used to select the appropriate approach for analysis between Panel Analysis and General Least Square (GLS), where the results show that there are no serial correlations; hence, GLS was the proper approach for analysis rather than panel analysis. The tests are based on the average of pair-wise correlation coefficients of the OLS residuals from the individual regressions in the panel, and used to test for cross section dependence, Pesaran (2004). Also the Hausman test was done to select the appropriate model for analysis between a fixed effect model (FEM) and a random effect model (REM) using the model hypotheses testing; H_0=Random Effect Model was appropriate and H_a=Fixed Effect Model was appropriate according to Hausman, (1978), in the Hausman CD test. A REM was therefore found to be the appropriate for analysis. The explanatory variables used in the study are: Firm Age (FA), Firm Type (FT), and Ownership

of shares concentration (OS), Firm Size (FZ), Capital Structure (CS) and Firm Profitability (FP). These variables were used to test all hypotheses i.e. (H1 to H6) using the Random Effects GLS regression model. The following model was used in the hypothesis testing to determine the factors that influence environmental disclosure:

$ED = \alpha_0 + \alpha_1 FA + \alpha_2 FT + \alpha_3 OS + \alpha_4 FZ + \alpha_5 CS + \alpha_6 FP + \varepsilon,$ Where:

ED = Level of Environmental Disclosure measured by number of Disclosure Scores
FA = Age of the firm measured by years Since Inception
FT = Type of the firm measured by Downstream 3, Midstream 2, Upstream 1
OS = Ownership of shares concentration measured by shareholders with ≥5%
FZ = Size of the firm measured by Natural Logarithm of Total Assets
CS = Capital Structure measured by Debt Equity Ratio or financial leverage
FP = Profitability of the firm measured by Return on Assets
E = Error term
α_0 = Constant term
α_1- α_6 = coefficients

Study Variables and Measurements

There were six independent variables and one dependent variable to be used in this study, as defined and measured below:

Table 1: Variables and Measurements

Variables	Definition	Measurement	References
Firm Age	Duration since the firm started operations	Years Since Inception	Dienes et al. (2016), Chandok and Singh (2017)
Firm Type	Operational level of the firms from upstream, midstream to down stream	Stream level, Downs 3, Mid 2, Up1	Said et al. (2013), Galani et al. (2012)
Ownership Structure	Number of block shareholders in the firms in relation to the public shareholders	Ownership of Shares Concentration i.e. Shareholders with ≥5%	Al-Shaer et al. (2017),Aljifri et al. (2012), Waweru et al. (2011)
Firms Size	Size of the firms in terms of assets it owns	Natural Logarithm of Total Assets	Nurhayati et al. (2016), Al-Shaer et al. (2017),Waweru et al. (2011)
Capital Structure	Relationship between owners funds and interest bearing debts or borrowed funds	Debt Equity Ratio	Al-Shaer et al. (2017),Waweru et al. (2011), Chandok and Singh (2017), Dienes et al. (2016)
Firm Profitability	This is a measure of financial performance of the firms	Return on Assets	Dienes et al. (2016)
Environmental Disclosure	Scores the firms earns in disclosure i.e. 3 monetary, 2 quantitative, 1 general and 0 for non- disclosure	Total Number of Scores	Said et al. (2013), Bowrin (2013), Kolsi (2017), Dobbs and Staden (2016), Hossain et al. (2017), Beck et al. (2010), Kamal et al. (2012), Eltaib (2012)

ANALYSIS AND INTERPRETATION OF RESEARCH FINDINGS

Descriptive Statistics

The findings in Table 2, show that firm age varied significantly from the youngest firm to the oldest firm, indicated by higher standard deviations, showing that in this extractive industry firms vary from old firms (187 years) to younger firms (7 years). This indicates that some firms in the

industry are very much younger and some far older than others, with a SD of 45 an indicator that the sample comprised firms with high age variations although coming from one industry.

Across all industry, it is indicated that the majority of firms are in the midstream operations, with the mean of 2.0. This means that there are many firms doing production and packaging and few firms working in the exploration stage and in the supply of finished products. Interestingly, firms across the industry indicated that there are 2 shareholders on average with shareholdings of ≥5%. The results also show that there are significant variations in the sample, especially where firms are of different sizes, with small firms grouped together with large firms, as indicated by an average SD of 4. Firm size seems to be evenly distributed across all groups, with a SD of 4.3. The results show that there are higher debt equity ratios in all firms, that is, 64% in the industry. This may be the result of low owners' capital capacity and firms being pushed to think of more bank loans to ensure that they can be strong financially. The industry seems to have very low return on assets (ROA) as a measure of firms' profitability or performance, as indicated by a negative ROA of 23%. It indicates that, generally the industry has higher risks and also huge operating expenses, which make it have a low bottom line with huge investments. Generally, there is low ED disclosure, as indicated by only an average of 16% of the expected disclosure index items.

Table 2: Descriptive Statistics

Variable	n	M	SD	Minimum	Maximum
FA (1)	216	41.986	44.718	7.000	187.000
FT (2)	216	2.000	.587	1.000	3.000
OS (3)	216	2.380	1.425	.000	7.000
FZ (4)	216	13.183	4.329	2.528	26.213
CS (5)	216	.640	.919	-1.121	5.352
FP (6)	216	-.226	1.854	-15.626	2.623
ED (7)	216	16.13	5.19	.00	36.66

Table 3, shows that correlations among variables are low i.e. not more that 0.9 as indicated by Hair et al. (2010) showing that there is no multicollinearity problem in the model. This is indicated by the lowest correlation being -0.0043 and the highest correlation being 0.3377**. Hence, there is an independence of each variable from one another and, therefore, there is no presence of a strong relationship between the independent variables.

Table 3: Correlations for Study Variables

Variable	1	2	3	4	5	6
FA (1)	1					
FT (2)	-0.045 (0.508)	1				
OS (3)	0.009 (0.897)	0.338** (0.000)	1			
FZ (4)	0.071 (0.301)	0.103 (0.130)	0.071 (0.298)	1		
CS (5)	-0.004 (0.950)	0.070 (0.308)	-0.030 (0.664)	0.234** (0.001)	1	
FP (6)	0.037 (0.588)	0.202** (0.003)	-0.090 (0.188)	0.092 (0.180)	-0.026 (0.707)	1

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

The independent variables are lowly correlated at a magnitude not exceeding 0.3377**, which is the highest correlation between firm type and ownership structure. The low correlations confirm that there is sufficient variation or independence among the independent variables to estimate discrete effects. Tabachnick and Fidell (1996) show that, where the bivariate correlation is 0.7 or more, one should think carefully before including two variables in the same analysis. Since the results show that all variables were lowly correlated independent of one another in the model, it allows the hypotheses to be tested to determine how each variable influences environmental disclosure.

Inferential Statistics and Hypotheses Testing

According to Hausman (1978), in the Hausman CD test, the Random Effect Model is appropriate since the p-valueis 0.1537, which is greater than 5%, as indicated in Table 4. Thus, we accept the H_0 and conclude that the Random Effects Model is the appropriate model.

The model assumes that unobserved heterogeneity is viewed as random drawn from a common population (Hsiao (2014)). Table 4 shows the summary statistics of the Hausman test. Residual serial correlation was tested using the Pesaran CD test and conclude that there is no serial correlation in the model residual, with Pesaran's test for cross sectional independence = -0.640 and p-value =0.5220.

Table 4: Hausman Test Summary Statistics

Variables	**Coefficients**			
	(b)	(B)	(b-B)	Sqrt. (diag(V_b-V_B)
	Fixed	Random	Difference	S.E.
FA	0.414	0.125	0.290	.050
OS	0.426	0.678	-0.252	.000
FZ	0.220	0.301	-0.081	.000
CS	0.417	0.686	-0.269	.000
FP	1.541	0.294	1.248	.000
Prob>chi2 =	**0.154**			
Residual Serial Correlation Test		Pesaran`s test for cross sectional independence = -0.640 P-value =0.5220.		

The study had 6 hypotheses to be tested, derived from each firm characteristic, that is, firm size, firm age, firm type, capital structure, ownership structure and firm profitability. To obtain the firm characteristics that influence environmental disclosure, a Random Effects General Least Square (GLS) regression model is used for analysis and the results are shown in Table 5. The GLS regression results are presented in Table 5, with environmental disclosure as the dependent variable. The results show that the model is significant at 1% significance level. The model has R^2 of 0.228 and also the low correlations among independent variables indicate that the variables are independent of one another. These results indicate that variables in the model represent significantly a powerful set of predictors of the environmental disclosure.

In the case of firm age, the first hypothesis (H1) stated that firm age positively influences environmental disclosure. This hypothesis is tested and the results show that coeff = 0.125, z = 4.64, and p value < 0.001, indicating that null hypothesis is rejected. This implies that firm age is significant at 1% significance level. Therefore, firm age significantly and positively affects environmental disclosure, meaning that older firms disclose more environmental activities than younger ones.

In the case of the second hypothesis (H2), which stated that firm size positively influences environmental disclosure, the results are consistent with expected sign, where coeff = 0.301, z =2.84, and p value = 0.005, indicating that null hypothesis is rejected. This implies that firm's size significantly affects environmental disclosure at 1% significance level. Therefore, firm size significantly and positively affects environmental disclosure, meaning that larger firms disclose more environmental activities and explains environmental disclosure in the extractive industry. In the case of firm type, the third hypothesis (H3) stated that the more firms engage in downstream, the higher the environmental disclosure. This hypothesis is tested and the results show that coeff = 3.177, z = 1.4, and p value = 0.161, indicating that the null hypothesis is accepted. The results are consistent with the expected sign though not significant. This means that more engagement in downstream operations does not affect environmental disclosure.

Hypothesis four (H4), which stated that there is a positive influence of capital structure on the environmental disclosure, was tested and the results show that coeff = 0.686, z = 1.98, and p value = 0.048 in line with expected sign, indicating that null hypothesis is rejected. This implies that capital structure, significantly and positively affects environmental disclosure at 5% significance level, meaning that higher geared or financially leveraged firms disclose more environmental activities. The findings, therefore, indicate that capital structure affects or influences and explains environmental disclosure in the extractive industry.

In the case of firm profitability, the fifth hypothesis (H5) stated that firm profitability positively influences environmental disclosure, and the results are consistent with expected sign where coeff = 0.294, z = 0.16, and p value = 0.871, indicating that null hypothesis is accepted. Therefore, though the results are consistent with expected sign, they indicate that firm profitability does not significantly affect environmental disclosure.

Hypothesis six (H6), which stated that block shareholders positively influence environmental disclosure, was tested and the results show that null hypothesis is rejected, where coeff = 0.678, z = 2.78, and p value = 0.005. This implies that ownership structure significantly affects environmental disclosure at 1% significance level, contradicting the expectation that there is a negative relationship between ownership structure and environmental disclosure. The findings,

therefore, indicate that ownership structure affects or influences and explains environmental disclosure in the extractive industry.

Table 5: Firm Characteristics and Environmental Disclosure

Variables	Estimate	SE	*Z*	95% CI		P
				LL	*UL*	
FA	0.125**	0.027	4.64	0.072	0.178	0.000
FT	3.177	2.269	1.4	-1.270	7.625	0.161
OS	0.678**	0.244	2.78	0.200	1.155	0.005
FZ	0.301**	0.106	2.84	0.093	0.509	0.005
CS	0.686*	0.347	1.98	0.006	1.365	0.048
FP	0.294	1.808	0.16	-3.249	3.837	0.871
Constant	-1.427	4.729	-0.3	-10.696	7.843	0.763
Sigma_u	4.803					
Sigma_e	2.974					
Rho 0.723 (fraction of variance due to ui)						
Random-effects GLS regression:						
Number of observations	216					
Group variable: Firms		Number of groups		18		
R-sq:		Observation per group:				
Within	0.190	Min		5		
Between	0.276	Avg		12.0		
Overall	0.228	Max		15.0		
Wald chi2(6)	47.27	P-Value				
Corr(u_i, X) = 0 (assumed)		Prob > chi2		0.000		

*. Correlation is significant at the 0.05 level.

**. Correlation is significant at the 0.01 level.

DISCUSSION OF FINDINGS

The study shows that firm age has a positive significant influence on environmental disclosure, implying that older firms disclose more environmental activities than younger ones. The findings also show that firm age varies significantly from the youngest firms to the oldest firms, indicated by higher standard deviations. This is in line with TEITI (2017), showing that in the extractive industry of Tanzania, firms vary from old firms (187 years) to younger firms (7 years). Variations in age may not be a problem, as the disclosure behaviour of firms is tested across the industry. These results are in line with Chandok and Singh (2017), who state that company age is positively associated with the level of environmental disclosure, indicating that older firms report more environmental issues. Since there must be some reasons to disclose any information, in this context this may be due to political reporting or experience and fear of the non-reporting costs which may have happened previously in the life of the firm. On the other hand, Lodhia et al. (2012) in support of this study, show that there is a strong relationship between firm age and environmental disclosure. Since in the Tanzanian context environmental disclosure is voluntary, firms may not fear environmental regulators but, rather, disclose environmental issues to please society. This study, therefore, concludes that older firms in both the mining and the oil and gas groups report more environmental issues, in line with legitimacy theory, which states that firms disclose environmental information to be seen as good citizens and to work in line with societal objectives.

The results show that the larger the firm, the more environmental information is disclosed by the managers. This is indicated by the firm size, which has a positive significant influence on environmental disclosure, indicating that larger firms disclose more environmental activities. In

line with TEITI (2017, 2018, and 2020) the extractive industry in Tanzania comprised firms of different sizes, from large firms to individually owned firms, a reason why the majority of firms in the industry cannot meet the materiality threshold of 300M Tshs revenue collection in a year. The results also show that there are significant variations in the sample, especially that firms are of different sizes and that small firms are grouped together with large firms, indicated by the higher standard deviation of 4. The study is in line with findings by Dienes et al. (2016) that firm size is the most important driver of the reporting of sustainability reports. On the other hand, in support of this relationship, Chandok and Singh (2017) state that environmental disclosure has an association with company size, and at the same time Haddad et al. (2017) claim that firm size affects the level of reporting. The findings are also in line with other studies (Ahmadi and Bouri, 2017; Bowrin, 2013; Drobetz et al., 2014; Karaman et al., 2018; Khan, 2010; Shamil et al.,2014; Wang et al., 2013; Rouf,2011), which maintain a positive relation between firm size and environmental disclosure. Since the extractive industry of Tanzania is likely to be vulnerable to environmental damage and pollution, large firms in the industry may be disclosing more information to show legitimacy, as disclosure is still voluntary, in line with Kuo and Yi-Ju Chen (2013), who indicate that firms with increased vulnerability, due to their size, disclose more information voluntarily as a means of managing legitimacy, especially firms operating in industries with high environmental impacts.

There is positive but insignificant relationship between firm type and environmental disclosure, indicating that the type or level of streams does not influence environmental disclosure. This may be caused by many firms being in the midstream level, which is not as polluting as downstream. This means that there are many firms doing production and packaging and few firms involved with the exploration stage and the supply of the finished products of minerals, oil and gas. In support of this study, Liu and Anbumozhi (2009) and Bowrin (2013) show that the amount of environmental disclosure is positively related to industry affiliation, while Said et al. (2013) find that there is a significant relationship between the industry type and the extent of environmental disclosure. They add that industry type is the most significant variable that influences the level of environmental disclosure, although there is more support of firms' types having an effect, as firms with increased vulnerability due to their industry disclose more information voluntarily (Kuo & Yi-Ju Chen, 2013). To show that firm type is important factors in environmental disclosure, Galani et al. (2012) indicate that firms from environmentally sensitive industries report more environmental issues. Although firm type seems in this study not to be a significant factor influencing environmental disclosure, the positive estimate indicates that firms in a highly-sensitive environmental category disclose more environmental information. This is in line with the legitimacy theory, that firms disclose more environmental information to pose as corporate citizens.

Capital structure significantly and positively determined environmental disclosure in the extractive industry of Tanzania, indicating that higher geared or financially leveraged firms disclosed more environmental information. The reason may be firms' focus on compliance and servicing their debts to avoid more penalties from regulators or to avoid other environmental expenses revealed by high gearing in the industry. This is in line with the expectations of legitimacy theory, whereby firms disclose environmental information to impress society, even if they have other intentions or motivations. The results show that there are higher debt equity ratios, that is, 64%, which upholds the aim of the National Investment Policy of 1996 to attract FDIs into oil and gas and other actors in the economy. This is because local firms have low capacity to participate in oil and gas (TEITI,

2020) due to lack of capital, as evidenced by the young and less developed capital markets in Tanzania. Higher debts may be the result of low owners' capital capacity and firms being pushed to think of more bank loans to ensure that they can be strong financially. In line with this study, Karaman et al. (2018), find that capital structure is significantly and positively associated with sustainability reporting. These findings indicate that firms which are highly geared report more environmental issues to avoid non-compliance charges to the regulators and society, that they harm the environment and avoid future environmental liabilities. This upholds the legitimacy theory, which shows that highly geared firms disclose more environmental information so that they can be seen as good citizens and that they care for the environment.

The findings indicate that firm profitability has a positive but insignificant influence on environmental disclosure. This indicates that more profitable firms disclose more environmental activities although the effects are not significant. Although generally the industry seems to have very low return on assets i.e. negative ROA of 23%, it can be concluded that the industry has higher risks and also huge operating expenses, which makes it have a low bottom line with huge investments. This also indicates the reason why many firms in the extractive industry fail to reach the materiality threshold in revenue collection as per TEITI (2017, 2018 and 2020). This positive relationship between firm performance and environmental disclosure is in line with Ahmadi and Bouri (2017). This study shows that profitable firms disclose more environmental information because they have greater financial resources to fund reporting, so they are more willing to assume the additional costs of producing and publishing a sustainability report (Gamerschlag et al., 2011), and that a company's profitability can affect the quantity of sustainability reporting. Through the legitimacy theory, the findings show that profitable firms report more environmental information, in order to be seen as good citizens and to avoid political and compliance pressures. This may be supported by the financial muscle profitable firms have to research and prepare both online and print environmental reports.

These results show that ownership structure is a significant incentive in influencing environmental disclosure. The findings show that ownership structure, positively affects environmental disclosure, indicating that firms which are owned by more block holders or with less public participation, disclose more environmental activities. In the Tanzanian context, firms across the industry groups indicate that there are two shareholders on average, with shareholdings of ≥5%, signaling that the majority of these firms are listed on stock markets in their home countries of origin or cross-listed. In the Tanzanian context, where the extractive industry is largely foreign owned and only 5 (28%) firms of the 18 involved in this study are listed on the Dar Es Salaam Stock Exchange (DSE), this means that decisions are made by a small number of owners, who are the majority shareholders, contrary to where ownership is local. In line with this study, Aljifri et al. (2012) show a positive relationship between reporting and block holders who own 5% -10%, while Drobetz et al. (2014) and Gamerschlag et al. (2011) show a positive association between the percentage of shares held by the largest shareholder and for the free float. From the legitimacy theory perspective, the results, therefore, show that firms with many block holders (fewer public members) report more environmental activities to show that they are operating in line with the public or society as a whole, since decisions are mainly made by a small number of majority shareholders.

CONCLUSION

This study concludes that most internal components influence environmental disclosure. This is evidenced by the following: that older firms disclose more environmental information in order to

protect their image and reputation already built, that large firms disclose more environmental information to protect their built image, that highly leveraged firms disclose more environmental information to avoid more risks associated with non- compliance, that firms with many block holders (fewer public members) disclose more environmental activities to show that they are operating in line with the interests of shareholders and therefore, that all these factors determine or explain environmental disclosure. Also, profitable firms and firms engaging more in downstream operations disclose more environmental information to avoid political and compliance pressures, though the last two factors are not significant in explaining or determining environmental disclosure. Generally, from the legitimacy perspective, firms disclose environmental information to be seen as good citizens and to show that they are working in line with social and community interests.

Theoretically the study contributes to the use of legitimacy theory in interpreting firm disclosure signals that, in a situation where there are fewer, weak stakeholders and low awareness about the use of environmental information, firms may sacrifice legitimacy to shareholders' interests. This is evidenced by firms with more block shareholders disclosing more environmental information to avoid non-compliance expenses, with the intention of improving their bottom line; they may do that not because they are good citizens and to avoid more environmental liabilities but to ensure that their interests or profits are protected. Therefore, this shows that legitimacy theory works better in an environment where both society and the stakeholders need and use environmental information, as well as knowing their rights and the duties of firms to protect the environment and where violation results in social penalties or costs.

Managerial implications are that the results help firms' management to improve their levels of environmental disclosure, as they are still very low (16%), and to participate in environmental activities as social citizens. Since the results indicate that only large, old, highly leveraged and firms owned by more block holders disclose significant amounts of environmental information, managers of all types of firms must also ensure that they disclose more environmental information for all users to access. Policy makers may use taxation incentives with firms which are the best disclosers, or use environmental disclosure as an indicator in the public tendering system etc., which may improve the low disclosure level indicated in the results.

Future researchers should use a qualitative approach where, by interviewing the preparers of financial statements, they may find different views about how firm characteristics motivate them to disclose environmental activities. They should also study other firms in an environmentally sensitive industry, combine the extractive industry with manufacturing and compare results. The idea is that future researchers in an extractive industry could use cross-sectional data to find what motivates environmental disclosure at a specific time rather than using panel or longitudinal data. They could also to find reasons for why firm type, capital structure and ownership structure are not significant factors in environmental disclosure in the extractive industry.

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