Profitability as the Determinant of Soft Environmental Disclosures

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Abstract

The profitability has been studied as the determinant of soft environmental disclosures (SED) first time in Pakistan. The Cement, Steel and Power generation sectors of Pakistan have been destroying the environment more as compared to other industries. This study finds the results of the sample of three years from 2015-2017. The Quantile regression is applied to find the impact of SED. Now the policymakers can look into the results at different quantiles. The quantile regression has been applied on 0.25 percentile, 0.50 percentile, and 0.75 percentile. The empirical results show that at every quantile the profitability is the significant positive determinant of SED.

Keywords: Determinants of environmental disclosure, Quantile regression, OLS, Soft environmental disclosure, profitability.

Introduction

The environmental pollution has been the main concern for the business world (Burgwal & Vieira, 2014). The waste and the emissions of toxic in air have been changing the climate (McGibbon & Van Belle, 2015). Researchers are considering this issue as one of the most important in last decades (Kolk, 2003). The increasing demand for environmental accountability holds the business organizations accountable (Burgwal & Vieira, 2014) for environmental issues (Michelon, Pilonato, & Ricceri, 2015).

To provide soft environmental disclosures (SED) is the function of corporate social responsibility CSR. The CSR cares the environmental issues (Ong, Mayer, Tost, & Wellman, 2018). Since 1990s, the researches related to determinants of environmental disclosure has become very popular among the researchers in the field of CSR (Burgwal & Vieira, 2014; Chandok & Singh, 2017; Junita & Yulianto, 2017) because environmental issues are the main concerns for the society (Brammer & Pavelin, 2006).

The Cement, steel and power generation sectors in Pakistan has been on the top which is destroying the environment (Imadudin, 2017). Now the government of Pakistan is taking this problem seriously and ready to take remedy for this problem (Tauqeer, 2017). It is the CSR of the companies not to destroy the environment. The companies which are disclosing environmental disclosures (EDs) are considered to be more environmental friendly (Mahoney, Thorne, Cecil, & LaGore, 2013) and this study finds that profitable cement companies are more likely to disclose SED in their financial statements.

The EDs are defined as "the process of communicating externally the environmental effects of organizations' economic actions through the corporate annual report or through a separate, stand-alone, publicly available environmental report." (O'Dwyer, 2001). "It encompasses reporting relating to environmental policies, impacts, processes and audits, environmental-related expenditures, the environmental benefits of products, and details regarding sustainable operations." (O'Dwyer,

2001). "Environmental disclosure attracts the attention of stakeholders" (Qiu, Shaukat, & Tharyan, 2016) that is why "the environmental information is the essential part of corporate environmental responsibility" (Carroll, 1999).

This study is the initial attempt to find the profitability as the determinants of SED in Pakistan. This study is novel because of the novelty aspect in Pakistan, and that aspect is the measurement of the quality environmental disclosures with the help of environmental disclosure index (EDI). Prior studies found the determinants of the quantity of environmental disclosure which includes counting like, pages based on environmental disclosures in the annual report and the word count (Chandok & Singh, 2017). The above measurement only measures the quantity not the quality of EDs (Brammer & Pavelin, 2006).

This study uses EDI that measures the quality of the environmental disclosures in the annual reports. The content analysis is used to check the quality of EDI and ensures whether the above-required issues are measured in the environmental disclosures or not (Clarkson, Li, Richardson, & Vasvari, 2008). Content analysis is used to measure the depth and quality of the environmental disclosures (Burgwal & Vieira, 2014). This study uses the content analysis index developed by Clarkson et al. (2008) along with the experts in the relevant fields. This index ensures the measurement of quality of environmental disclosures. This index is suitable for those researchers who are interested in finding the true exposures of environmental disclosures of a firm (Burgwal & Vieira, 2014). The index is based on the scorecard which is based on Global Reporting Initiative (GRI) as well as unique and complete.

Literature Review

The valuable contributions are available in the area of CSR (Majeed, Aziz, & Saleem, 2015), there is a study that finds the link between corporate governance and environmental disclosures (Rafique, Malik, Waheed, & Khan, 2017), another research is available to find the impact of environmental disclosures on environmental performance (Mahmood, Ahmad, Ali, & Ejaz, 2017) but the study based on determinants of the quality level of environmental disclosures in Pakistan is not available.

Many studies have attempted to find the factors that affect environmental disclosures. It is argued that environmental disclosures are positively associated with environmental performance (Iatridis, 2013). The financial fundamentals like the need of capital, large size, profitability are also positively linked to environmental disclosures and sectors like food producers, forestry and paper, chemical, industrial metals and mining normally present the high-quality disclosures (Iatridis, 2013).

Similarly, it is also argued by taking the sample of firms from another developing country like China, that study finds that industry classification, size of the firm and the profitability are positively associated with environmental disclosures quality (Lu, Chau, Wang, & Pan, 2014). The literature discusses the weak influence of shareholders and the strong influence of creditors on environmental disclosures. The results of the control variables are also found to be significant.

Another argument emphasis that these days many firms around the world are focusing on non-financial reporting like environmental disclosures quality (Mendes-Da-Silva & Onusic, 2014). It studies the 100 companies operating in Greece in the context of the composite disclosures index. That study argues that many determinants derive the environmental disclosures quality in leading companies in Greece. Mendes-Da-Silva and Onusic (2014) use the size of the firms by measuring the number of employees and profitability as determinants of environmental disclosures. They further criticize that some non-listed companies even do not show any financially-related disclosures.

The researchers could not find the conclusive association between financial performance and environmental disclosures. There is a study that argues that profitability can be the driver of social disclosures (Ali, Frynas, & Mahmood, 2017), but that study could not find any relation between financial performance and environmental disclosures. In fact, the contents of environmental disclosures vary by industry, time and company (Iatridis, 2013).

Theoretical Framework and Hypothesis Development

Freeman defines stakeholders as "any group or individual who can affect or is affected by the achievement of an organization's objectives" (Freeman & McVea, 2001). There are two views which are supported by the stakeholder theory, one is a moral view and the other one is the strategic view (Frooman, 1999). "On the other hand, strategic view says that stakeholder can provide opportunities to the firms in attaining a social license for running smooth operations and therefore the pressure groups and environmentalist also act as important stakeholders of the firm." (Freeman & McVea, 2001). "There is a study that says that customers are purchasing the products of those firms that are known to environmentally friendly." (Ott, Wang, & Bortree, 2016).

The stakeholder theory presents the different powers of the stakeholders. The different stakeholders are always moving randomly in the framework of the firms' operations. Any stakeholder can become a key player at any point in time and then the firms have to create a balance between the power of key players and their objectives. The main concern for the firms is that all stakeholders are concerned for environmental disclosure of the firms. If the firms are not environmental friendly then every stakeholder can become the key player and affect the going concern assumption of the firms and the other side of this theory is that if the firms are providing more and more environmental disclosure then every stakeholder may appreciate the societal image of the firms (Burgwal & Vieira, 2014).

It can be argued that profitability of the firm is directly linked to environmental disclosures and It is argued because "profits provide managers with a pool of resources from which the costs of making environmental disclosures are funded." (Brammer & Pavelin, 2006).

It can also be argued that if a firm is presenting detailed environmental disclosure to the stakeholders then it is a clear-cut message that the firm can bear the cost of extra reporting that is environmental disclosure. Similarly, it is a clear message that the firm is having a long-term strategy and plans to remain profitable and environmentally friendly.

The level of environmental disclosure will be the symptom of the high capability of the managers and the directors and it also shows the long-term planning of the firm for better performance. Although the literature provides mixed findings, researchers find a positive significant relationship between the profitability and environmental disclosure (Clarkson et al., 2008). On the other hand, a study failed to empirically come up with a significant association between profitability and environmental disclosure (Brammer & Pavelin, 2006).

On the other hand, theoretically it should be studied that there can be a positive association between financial performance and environmental disclosure, it can also be argued that firms with better profitability can issue more costs on environmental disclosure (Brammer & Pavelin, 2006).

On the basis of the above debate, the following hypothesis can be developed.

H$_1$: The Financial performance of the firm has a significant impact on quality environmental disclosure.

Methodology

This study is quantitative in nature and is based on primary and secondary data. The primary data related to the level of environmental disclosure index is developed by analyzing the level of

environmental disclosure from the annual reports of the companies. The population of this study is a non-financial sector of Pakistan and the initial sample consists of 61 companies listed on the Pakistan Stock Exchange (PSX) in Pakistan. The sample of this study is based on purposive sampling techniques and includes the companies of Cement, Steel and Power generation sectors. Because these three sectors are considered to be more environmental polluting sectors.

The final sample after removing samples having missing data comprises of 42 companies. The data comprises from 2015-2017 so there are 126 observations left for panel study. The data were collected from annual reports available on the websites of the companies. The companies use their annual reports as a medium to report environmental disclosures. If one company does not publish a separate Corporate Social Responsibility report, then this study measures the environmental disclosure available in the company's Corporate Social Responsibility report.

In this research, the audited annual published reports are used for analysis. There is a separate chapter of CSR in the annual reports in Pakistan that is why for analysis those CSR reports and other pages related to environmental disclosure are analyzed from annual reports of the companies. Other variables are also collected from the annual reports of the companies.

Dependent variable: the disclosure index

The index/scorecard used in this study is able to measure the specific level of environmental disclosure (Clarkson et al., 2008) (See Appendix A). This index will score each item related to the level of environmental disclosure in the form of yes or no (1/0). In order to make the findings reliable, two expert coders fill the index along with the researcher and finally reconciled and thoroughly re-evaluated in order to minimize the uncertainty of any individual judgment (D'Amico et al., 2016).

This index developed by Clarkson et al. (2008) is suitable for measuring the level of environmental disclosure (Burgwal & Vieira, 2014). This index contains the measures of two major types of level of environmental disclosure one is "hard disclosure" and the other is "soft disclosure". The index includes 29 items to measure the hard disclosure and 16 items to measure the soft disclosure. This index is broadly divided into 7 categories, the categories from 1-4 are to measure the hard disclosure and the categories from 5-7 will determine the soft disclosure.

The scorecard used in this study comprises of 7 broad categories and each category measures the specific possible level of environmental disclosure. These areas are as follows:

1. Category 1 measures the structure adopted by the governance and the system applied by the management and these systems are developed with respect to environmental protection.

2. Category 2 measures the credibility of the environmental disclosure.

3. Category 3 measures the environmental performance indicators (EPI).

EPIs are allocated extra scores ranging from 0-6 if the company discloses extra disclosure like trends, environmental targets and industry averages etc.

4. Category 4 measures the expenditures occur by the management for environmental protection.

5. Category 5 measures the quality and depth of environmental strategy and environmental protection future plans.

6. Category 6 measures the company profile related to the environment.

7. Category 7 measures the environmental initiatives taken by the company.

The problems related to content analysis are reliability and replicate, which has been solved by the agreement of raters to get results inconsistent with each other.

Independent variables

Financial performance

The financial performance is measured by using earning per share (Sulaimana, Abdullahb, & Fatimaa, 2014).

Age of firm (FA)

The companies that have been comparatively older on the market have better control over performance and reporting (D'Amico et al., 2016). The quality disclosures are observed by the companies that have been on the market with longer histories (D'Amico et al., 2016). Therefore, this variable is measured by the number of years since the first IPO of the companies (D'Amico et al., 2016).

Firm size (FS)

The size of the listed companies is measured by using the natural logarithm of the total sales (Brammer & Pavelin, 2006; Clarkson et al., 2008; D'Amico et al., 2016).

Audit (B4)

A dichotomous variable is applied to examine the influence of the external auditors (D'Amico et al., 2016). The variable takes two values 1 and 0, the value of 1 is used if the audit firm is one of the Big Four (PricewaterhouseCoopers, KPMG, Ernst & Young, and Deloitte & Touché) and on the other hand, a value of 0 if the audit firm is other than the Big Four (D'Amico et al., 2016).

Board size (BS)

The sum of the number of directors will determine the board size (Brammer & Pavelin, 2006).

Quantile Regression

Quantile regression is used when the estimated coefficients of explanatory variables may become poor at different quantiles of the distribution of the predicted variable (Parente & Silva, 2016). The contribution of Koenker and Bassett (1978) has taught the world to overcome the above problem. The quantile regression is regression used for the data which is not normally distributed (Koenker & Bassett Jr, 1978). The quantile regression provides more robust results against outliers as compared to Ordinary Least Square Model (OLS) (Chen, Chu, Wu, Tsembel, & Shen, 2017). This study is based on median regression as the dependent variable is skewed. So the emphasis of the regression will be on the median as compared to mean.

Since the data in this study contains large outliers, on the other hand, the data is not normally distributed. The distribution is not normal in this study. Therefore the model in this model will be mathematically expressed as:

$$y_i = x_i{}' \propto_\theta + u_{\theta i}$$
$$Quant_\theta(y_i|x_i) = inf\{y : Fi(y|x)\theta\} = x_i{}'\alpha_\theta$$
$$Quant_\theta(u_{\theta i}|x_i) = 0$$

The above model is based on the assumption that let (y_i, x_i), *i=1,...,n* be a sample from population on where x_i is a *(K X 1)* vector of repressors. Let us say that θth quantile of distribution of is y_i linear in x_i. In the above models $Quant_\theta(y_i|x_i)$ is the θth quantile of y_i on the regressor vector x_i,

α_θ is the unknown vectors of parameters for different values of θ in (0,1) and u_θ is the error term and $Fi(.|x)$ is the distribution function of *y*. The entire distribution of *y* on *x* will be traced by changing θ from 0-1. Below is the model of this study which is based on the study of Ortas at el. (2015).

$$Q_\theta\langle SEDI_{it}|x_{it}\rangle = \beta_{\theta 0} + \beta_{\theta 1}FP + \beta_{\theta 2}FA_{it} + \beta_{\theta 3}FS_{it} + \beta_{\theta 4}B4_{it} + \beta_{\theta 5}BS_{it} + \varepsilon_{\theta it}$$

Here the HEDI, SEDI, & TEDI are the dependent variables which are hard, soft, & total environmental disclosure index respectively and FP is financial performance, FA is firm age, FS is the firm size based on total sales, B4 is the audit by big four audit firms and BS is the board size and $\beta_1 - \beta_5$ are the coefficients of the independent variables. The "i" is for the company and "t" is for time period whereas the "ε" is the error term.

Results

Table 1 shows the summary statistics used in this study by using Stata 12 statistical software. The mean score under soft disclosure of the sample companies is 4.738095. Many companies under this part of the disclosure index present maximum disclosure.

Table 1. Descriptive statistics of variables

Descriptive statistics of variables - Observation 126 (42*3)				
Dependent variables	Mean	Standard deviation	Minimum value	Maximum value
SEDI	4.7380	4.6323	0	16
Independent variables				
FP	10.598	27.031	-5.1	292
FA	33.880	19.680	8	104
FS	3.8849	0.6204	2.1	5.3
B4	0.6428	0.4810	0	1
BS	7.5714	1.6416	5	14

The financial performance (FP) is measured by using earnings per share in this study. The maximum earnings per share in the sample is 292 but the mean value of earnings per share is 10.59841that is again proportionally low as compared to the maximum value. Most of the companies are at the Firm age (FA) of 33.88095 that is again proportionally lower as compared to a maximum score of 104. The maximum board size (BS) of the sample is 14 and the average score is 7 that shows most of the companies have 7.571429 directors in the sample.

The data in this study is almost not normally distributed that is why non-parametric regression has been applied in the data. The probability values of all the variables except FS have not been normally distributed.

Table 2. Normality test

Dependent variables	Observation	Probability of Skewness	Probability of kurtosis	Probability>chi^2
SEDI	126	0.0004	0.4569	0.0039
Independent variables				
FP	126	0.0000	0.0000	0.0000
FA	126	0.0000	0.0046	0.0000
FS	126	0.1028	0.2094	0.1149
B4	126	0.0070	-	-
BS	126	0.0000	0.0000	0.0000

Results for SEDI

Table 3. Regression results when soft disclosure is used as the dependent variable

Independent variables	OLS	Non-parametric analysis		
	Coefficient (pooled regression)	Quantile regression (.25)	Quantile regression (.50)	Quantile regression (.75)
	Dependent variable (SEDI)			
FP	0.02478	0.026*** (0.000)	0.0164** (0.024)	0.074*** (0.000)
FA	0.01233	0.024*** (0.001)	-0.0166274	0.0247101
Size	1.1702	0.43878	1.080465	1.649087* (0.060)
b4	0.2209* (0.063)	-0.0171107	0.1718192	2.803258** (0.027)
BS	0.5515311	1.241441*** (0.000)	0.7472721** (0.017)	0.0792841
Constant term	-3.970948	-9.389499*** (0.000)	-5.775302* (0.071)	-3.208711
R square	0.1042	-	-	-
F-statistics	2.79** (0.0202)	-	-	-
*	Significant at 10% (*p-values are written within brackets*)			
**	Significant at 5% (*p-values are written within brackets*)			
***	Significant at 1% (*p-values are written within brackets*)			

Table 3 shows the results of OLS regression and quantile regression at different quantiles like 0.25, 0.50 and 0.75. OLS shows the positive insignificant coefficients of FP, FS, and BS, on the other hand, the negative insignificant coefficients of FA. The coefficient of B4 is positive and significant at 10%. The quantile regression shows the positive coefficient of FP at every quantile with a p-value less than 1%. The coefficient of FA is negative with an insignificant p-value. FS is positive at 0.75 quantiles with 10% significance. The coefficient of B4 is also positive at 5% significance level at 0.75 quantiles and finally, the BS have positive coefficient at 0.25 and 0.5 quantiles with a p-value less than 1% and 5% respectively.

Conclusion

Table 3 shows the financial performance (FP) and board size (BS) are the positive determinants of soft disclosure (SEDI) at the 50th percentile at the significance level of 5%. This regression does not find any other determinant at the 50th percentile at any significance level.

The financial performance (FP) is the only positive determinants of soft disclosure (SEDI) at the 75th percentile at the significance level of 1%. Size is a positive determinant at 10% significance level. The audit (B4) is a positive determinant of at 5% significance level. This regression does not find any other determinant at the 75th percentile at any significance level. Size of the firm (FS) is the positive determinant of soft disclosure (SEDI) at 25th percentile at the significance level of 10%.

The H1 is accepted at all quantiles by quantile regression but rejected by OLS. H2 is rejected at all quantiles except 0.25 quantile as negative determinant but also rejected by OLS. H3 is rejected by OLS and accepted by quantile regression at 0.75 quantiles. H4 is accepted by quantile regression at 0.75 quantiles and OLS as well but rejected at other quantiles. H5 is accepted at 0.25 and 0.5 quantiles.

Financial performance is the positive significant determinant of hard environmental disclosures and this result is in line with legitimacy and stakeholder theories. Firm age is a negative significant determinant of hard environmental disclosures and it is opposite to legitimacy and stakeholder theories. Firm size, Audit quality, and Board size are the positive significant determinants of hard environmental disclosures and these results are in line with legitimacy and stakeholder theories.

Financial performance is the positive significant determinant of soft environmental disclosures and this result is in line with legitimacy and stakeholder theories. Firm age is a negative significant determinant of soft environmental disclosures and it is opposite to legitimacy and stakeholder theories. Firm size, Audit quality, and Board size are the positive significant determinants of soft environmental disclosures and these results are in line with legitimacy and stakeholder theories.

Financial performance is the positive significant determinant of total environmental disclosures and this result is in line with legitimacy and stakeholder theories. Firm age is a negative significant determinant of total environmental disclosures and it is opposite to legitimacy and stakeholder theories. Firm size, Audit quality, and Board size are the positive significant determinants of total environmental disclosures and these results are in line with legitimacy and stakeholder theories.

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Appendix A
Index 1
Environmental disclosure index (Clarkson, Li, Richardson, & Vasvari, 2008)

Index assessing the quality of discretionary disclosures about environmental policies, performance and inputs

Hard disclosure items
(A1) Governance structure and managements systems (maximum score is 6)
1. Existence of a department for pollution control and/or management positions for env. Managements. (0-1)
2. Existence of an environmental and/or public issues committee in the board (0-1)
3. Existence of terms and conditions applicable to suppliers and/or customers regarding env. Practices. (0-1)
4. Stakeholder involvement in setting corporate environmental policies (0-1)
5. Implementation of ISO14001 at the plant and/or firm level (0-1)
6. Executive compensation is linked to environmental performance (0-1)

(A2) Credibility (maximum score is 10)
1. Adopting of GRI sustainability reporting guidelines or provisions of a CERES report (0-1)
2. Independent verification/assurance about environmental information disclosed in the EP report/web (0-1)
3. Periodic independent verifications/audits on environmental performance and/or systems (0-1)
4. Certification of environmental programs by independent agencies (0-1)
5. Product certification with respect to environmental impact (0-1)
6. External environmental performance awards and/or inclusion in a sustainability index (0-1)
7. Stakeholders involvement in the environmental disclosure process (0-1)
8. Participation in voluntary environmental initiatives endorsed by EPA or Department of Energy (0-1)
9. Participation in industry specific associations/initiatives to improve environmental practices (0-1)
10. Participation in other environmental organizations/assoc. to improve, environmental practices (if not awarded under 8 or 9 above) (0-1)

(A3) Environmental performance indicators (EPI) (maximum score is 60)
1. EPI on energy use and/or energy efficiency (0-6)
2. EPI on water use and/or water use efficiency (0-6)
3. EPI on green house gas emissions (0-6)
4. EPI on other air emissions) (0-6)
5. EPI on TRI (land, water, air) (0-6)
6. EPI on other discharges, releases and/or spills (not TRI) (0-6)
7. EPI on waste generation and/or management (recycling, re-use, reducing, treatment and disposal) (0-6)
8. EPI on land and resources use, biodiversity and conservation (0-6)
9. EPI on environmental impacts of products and services (0-6)
10. EPI on compliance performance (e.g. exceedances, reportable incidents) (0-6)

(A4) Environmental spending (maximum score is 3)
1. Summary of dollar savings arising from environment initiatives to the company (0-1)
2. Amount spent on technologies, R&D and/or innovations to enhance environ. perf. and/or efficiency (0-1)
3. Amount spent on fines related to environmental issues (0-1)

Soft disclosure items

(A5) Vision and strategy claims (maximum score is 6)
1. CEO statements on environmental performance in letter to shareholders and/or stakeholders (0-1)
2. A statement of corporate environmental policy, values and principles, environ codes of conduct (0-1)
3. A statement about formal management systems regarding environmental risk and performance (0-1)
4. A statement that the firm undertakes periodic reviews and evaluations of its environ. performance (0-1)
5. A statement of measureable goals in terms of future env. performance (if not awarded under A3) (0-1)
6. A statement about specific environmental innovations and/or new technologies (0-1)

(A6) Environmental profile (maximum score is 4)
1. A statement about the firms' compliance (or lack thereof) with specific environmental standards (0-1)
2. An overview of environmental impact of the industry (0-1)
3. An overview of how the business operations and/or products and services impact the environment (0-1)
4. An overview of corporate environmental performance relative to industry peers (0-1)

(A7) Environmental initiatives (maximum score is 6)
1. A substantive description of employee training in environmental management and operations (0-1)
2. Existence of response plans in case of environmental accidents (0-1)
3. Internal environmental awards (0-1)
4. Internal environmental audits (0-1)
5. Internal certification of environmental programs (0-1)
6. Community involvement and/or donations related to environ. (if not awarded under A1,4 or A2,7) (0-1)