Impact of Environmental Performance on Financial Performance: Empirical Evidence from Indian Banking Sector

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ABSTRACT

There has been long-standing debate over whether or not firms gain economic competiveness from reducing their impact on the environment. Although ample literature is available on association between environmental performance and financial performance across various sectors, little empirical evidence is available in context of Indian banking sector. This research aims to analyze whether there is any significant relationship between environmental performance and financial performance of banks operating in India for a period 2013-14 to 2017-18. Secondary data has been collected for a sample of 83 banks operating in India. Content analysis was applied to extract information about environmental performance disclosed by sample banks followed by construction of environmental disclosure score index. Hierarchical multiple regression was applied to analyze relationship between environmental performance and financial performance after controlling for effects of size, financial leverage and capital intensity. Results exhibit no significant relationship between environmental performance and financial performance of banks operating in India. Findings of this research are expected to provide insight to users and readers of financial statements to have better understanding about the environmental practices carried out by banks. It would also contribute significantly towards decision making for policy makers in Indian banking sector to establish mandatory environmental legislations for reporting on environmental practices in order to improve non financial disclosure and financial performance in Indian banking sector.

1. Introduction

Rising environmental significance worldwide has witnessed a paradigm change of business firms from conventional financial expectations to sustainable development. World Commission on Environment and Development of the United Nations defines sustainable development as "development that meets the needs of present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). One of the serious and imperative concern that poses gravest of danger to the environment and subsequently to existence on this planet is climate change caused due to emission of green house gases, inefficient management of e-waste, deforestation etc. (Banuri & Opschoor, 2007) and eventually jeopardizes the conduit of sustainable development. Besides, inefficient consumption of scarce resources by the companies has resulted in degradation of environment. Scant resources are being exploited for dealing with environment related issues which could have been utilized for development of nation and economy (Malarvizhi & Matta, 2016). Since business depends on the environment for natural and human resources, it must take the accountability for the outcome of their actions and make active contribution to the society and environment in which it functions (Wisuttisak & Wisuttisak, 2016). Intergovernmental Panel on Climate Change (IPCC, 2014) recognizes that climate change is expected to have grim consequences on diverse sectors that banks finance viz.-a-viz. agriculture, infrastructure, food supply, precipitation, water supply etc. Considering the critical transitional role banks occupy in the financial system between the borrowers and lenders, there is an utmost

need for banks to disclose and evaluate environmental performance (Bimha & Nhamo, 2017). While much of disclosures concerning environmental performance are voluntary, yet various legislations have been framed by government to safeguard the environment at national and international level (Malarvizhi & Matta, 2016) and require the companies to make extensive continuous disclosures on environmental performance based on environmental activities carried out and address stakeholders demands (Chang, 2015). In the context of Indian banking sector, banks disclose environmental performance through annual reports, business responsibility reports, corporate social responsibility reports or standalone sustainability reports.

Hence, substantial rise in environmental friendly practices calls for banks to reassess their business model and incorporate environmental practices into all aspects of banking sector operations (Roy & Mitra, 2015). Pioneer attempt has been made by Yes Bank by becoming a member of United Nations Environment Program – Finance Initiative (UNEPFI). UNEPFI is a universal affiliation of United Nations Environment Programme with financial sector that proposes to encourage sustainable finance with particular emphasis on climate change (UNEPFI, 2019). Attention to environmental practices act as a strategic tool to sustain vigorous relationship with key stakeholders groups, such as investors, creditors, government and customers, which prevents costly stakeholder conflicts and leads to better financial performance (Hull and Rothenberg, 2008).

Relationship between environmental performance and financial performance has been extensively studied across various business sectors (Haninun et al., 2018; Jain et al., 2016; Arslan-Ayaydin & Thewissen, 2016; Delmas et al., 2015). However, only few studies have established the relationship using environmental indicators issued by Global reporting initiatives (GRI) guidelines (Malarvizhi & Matta, 2016; Chang, 2015). Past literature indicates that banking sector has received very less attention to study the impact of environmental performance on financial performance, specifically based on GRI G4 environmental indicators. Accordingly, this research attempts to fulfil the existing gap using environmental performance as an independent variable and financial performance (represented by return on assets (ROA)

and return on equity (ROE)) as dependent variable. Size of bank, financial leverage and capital intensity has been employed as control variables. Besides contributing to extant literature, this research would provide insight to users and readers of financial statements to have better understanding about the environmental practices carried out by banks. It would facilitate decision making for policy makers to establish the environmental regulations according to quality of environmental disclosures made by banks.

2. Review of Literature and Hypotheses Development

Environmental activities have become a subject of increased analysis by diverse stakeholders (Lioui & Sharma, 2012). It has not only fascinated the attention of industries, but also academicians and researchers. Large number of studies has been conducted on environmental performance both in developed and developing countries (Tambovceva, 2016; Klossner, 2014). Jaikumar et al., (2013) examined the organizational factors that contribute significantly towards environmental performance on a sample of 30 companies belonging to different industrial sectors, sizes, pollution intensity and ownership category. However, it did not establish the relationship between environmental performance and financial performance. Based on stakeholder theory, large body of extant literature supports the belief that better environmental performance provides competitive advantage to the firms over its competitors (Lin et al., 2015; Sharma & Vredenburg, 1998), enhances output by attracting and retaining employees (Rowley & Berman, 2000; Hart & Ahuja, 1996), increases income by attracting socially conscious consumers (Trudel & Cotte, 2009; Hillman & Keim, 2001) and eventually leads to increased financial performance (Brammer & Millington, 2008; Funk, 2003). Stakeholder denotes an individual or entity or any group that has a potential to influence or is influenced by the accomplishment of objectives of an organization (Freeman, 1984). Stakeholders influence availability of resources for operational activities of business; thereby companies must accomplish the needs and aspirations of these stakeholders (Chariri & Ghozali, 2007). Accordingly, Haninun et al. (2015); Stefan & Paul (2008); King & Lenox (2001); Konar

& Cohen (2001); Russo & Fouts (1997) observed a liaison between environmental performance and financial performance and found that it pays to be green. Laskar et al. (2017) using a sample of 28 listed non-financial firms from India and 35 from Japan examined the alliance amid sustainability performance and financial performance. Using regression model, study found positive significant impact of sustainability performance on financial performance for both the nations. Results exhibited that environmental performance dominates financial performance in Japan unlikely in India where social performance is more dominating in influencing financial performance. Using a broad sample of firms, Manrique and Marti-Ballester (2017) examined the impact of environmental performance on financial performance during global financial crisis. It was found that environmental performance of firms situated in developing countries exerts more influence on financial performance than that of developed countries.

Some studies underpin either no or negative relationship between two constructs (Nag & Bhattacharyya, 2016; Lioui & Sharma, 2012; Gilley et al., 2000), thereby providing evidence for neo classical agency theory proposed by Friedman (1970). It regards corporate managers as agents and must work in the best concern of shareholders. Promoting social and environmental aspirations at the cost of foremost objective of increasing profit is undesirable. Palmer et al. (1995); Walley & Whitehead (1994) also supported neo-classical perspective and considers increased environmental activities impose additional costs for the companies. Chang (2015) carried out a study on a sample of eight industries in China using unbalanced panel data and observed considerable negative influence of environmental performance on financial performance represented by Tobin's Q value. Cordeiro & Sarkis (1997) using multiple regression analysis on a sample of 523 United States corporations demonstrated a significant negative relationship between toxic release inventory data (as a proxy of environmental performance) and earnings per share (a proxy of financial performance). Besides, some researchers found no significant relationship between environmental performance and financial performance (Malarvizhi & Matta, 2016; Naila, 2013; Sarumpaet, 2005). Aggarwal (2013) using

sample of 20 non-financial listed companies reporting on Global Reporting Initiative (GRI) guidelines observed no significant impact of sustainability on financial performance. Rajput et al. (2013) observed that environmental initiatives are yet in early phase in the context of Indian banking sector and no substantial connection subsists amid execution of environmental activities by banks and their financial performance.

Based on the above arguments, it is hypothesized that:

H1: There is a significant relationship between environmental performance and ROA of banks operating in India.

H2: There is a significant relationship between environmental performance and ROE of banks operating in India.

3. Research Methodology

Research emphasizes on banks operating in India and attempts to address a perennial question on the relationship between environmental performance and financial performance for a period of 5 years from 2013-14 to 2017-18. A sample of 83 banks comprising of 23 private sector banks, 21 public sector banks, 20 foreign banks, 16 regional rural banks and 3 co-operative banks has been selected depending on availability of data. Research relies on secondary data gathered through published and audited annual financial reports collected from official website of respective banks and Reserve Bank of India, Independent Auditors Reports, Business Responsibility Reports according to National Voluntary Guidelines/Corporate Social Responsibility Reports/Standalone Sustainability Reports/ Global Responsibility Initiative Reports collected from official website of respective banks.

Measurement of Environmental Performance

For this research, environmental performance is employed as independent variable (Haninun et al., 2018; Laskar et al., 2017; Manrique & Marti-Ballester, 2017; Chang, 2015; Nakao et al., 2007). To measure environmental performance, variables viz.-a-viz. compliance, e-waste, emissions, energy, material, products & services and water have been selected.

Table 1: Description of variables of environmental performance.

Variables	Description
Compliance	Environmental fines and sanctions
E-waste	E-waste management and recycling of waste & its disposal
Emissions	Reduction in green house gas emissions and carbon emissions
Energy	Energy conservation and reduction in energy consumption
Material	Reduction in consumption of paper
Products and services	Products and services designed with environmental opportunities and risks
Water	Water conservation

Source: G4 Sector Disclosure (Global Reporting Initiative, 2013)

Environmental variables selected are based on GRI G4 guidelines (Laskar et al., 2017; Malarvizhi & Matta, 2016; Chang, 2015) for financial sector. GRI indicators attempt to standardize and harmonize reporting practices and are being employed widely in research (Munoz et al., 2015). Furthermore, content analysis has been applied by classifying and scrutinizing the content of texts (Bayoud et al., 2012) to extract information about environmental performance/ environmental related disclosures by sample banks (Chowdhury, 2018; Laskar et al., 2017; Malarvizhi & Matta, 2016; Rajput et al., 2013; Singal, 2013). Value "1" has been assigned if information indicates that bank has performed some activity regarding the variable coded and "0" is assigned if no activity related with the variable has been disclosed by the bank. Subsequently, disclosure score index has been constructed to derive environmental performance score (Laskar et al., 2017; Chang, 2015) using the following formula:

$$Ib = \frac{\sum_{i=1}^{n} Xib}{nb}$$

Source: Branco & Rodrigues, 2008
where,
nb = maximum expected score for each category
b = bank
i = environmental variables
Xib = estimated score of bank b at period t.
Xib assumes value of '1' for disclosed information and '0' if information is not disclosed.

Measurement of Financial Performance

Research employs financial performance as dependent variable (Maqbool & Zameer, 2018; Sandaruwan & Ajward, 2018) and has been measured through accounting based measures namely ROA and ROE as widely used by researchers (Chowdhury, 2018; Haninun et al., 2018; Saeidi et al., 2015; Busch & Hoffmann, 2011; Preston & Bannon, 1997). ROA which signifies the earnings generated from the investment made in total assets, thereby indicating efficient utilization of total assets (Palepu et al., 2010) has been calculated by dividing net income by total assets (Teoh et al., 1998; Freedman & Jaggi, 1988). ROE, an indication of value creation for its shareholders by the company (Ahsan, 2012) has been calculated by dividing net income by total equity (Haninun et al., 2018).

Measurement of Control Variables

To avoid the likelihood of obtaining prejudiced results and to ascertain concrete relationship between the variables, a number of control variables have been used for this research (Manrique & Marti-Ballester, 2017). These variables include size of bank, financial leverage and capital intensity (Maqbool & Zameer, 2018; Manrique & Marti-Ballester, 2017; Malarvizhi & Matta, 2016; Chang, 2015). Size of has been used as a proxy of volume of total assets, financial leverage as leverage ratio (debt to equity) and capital intensity as a proportion of fixed assets to total assets (Maqbool & Zameer, 2018; Gbadamosi, 2016).
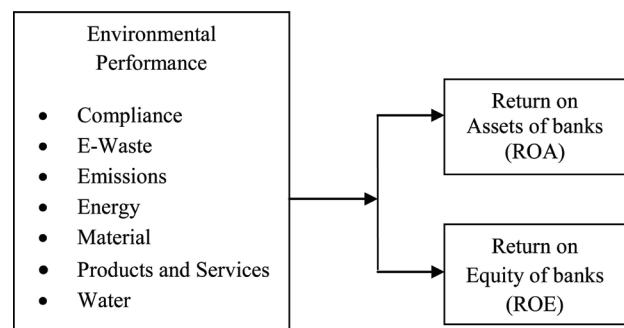
Conceptual Framework

Figure 1: Conceptual Framework
Source: Authors' own

Research Model Design

To investigate the relationship amid environmental performance of banks and financial performance,

research adopts hierarchical multiple regression (Usman & Amran 2015; Balabanis et al., 1998). Hierarchical multiple regression method has been used since it is a superior estimation method and allows the researchers to effectively manage the control variables (Pallant, 2007). The following model has been used:

$$ROA = \beta o + \beta_1 EP + \beta_2 Size + \beta_3 leverage + \beta_4 CapInt + \varepsilon \quad (1)$$

$$ROE = \beta o + \beta_1 EP + \beta_2 Size + \beta_3 leverage + \beta_4 CapInt + \varepsilon \quad (2)$$

Where,

ROA = Financial performance as a proxy of return on assets (ROA)

ROE = Financial performance as a proxy of return on equity (ROE)

βo = Constant

$\beta_1: \beta_4$ = Estimates of independent variable

EP = Environmental Performance as a proxy of compliance, e-waste, emissions, energy, material, products & services and water

Size = Size of bank as a proxy of natural log of total assets

Leverage = Financial leverage as a proxy of ratio of total debt to total equity

CapInt = Capital intensity as a proxy of ratio of fixed assets to total assets

ε = Error term

4. Analysis of Results

To analyze the distribution of data, Kolmogorov-Smirnov and Shapiro-Wilk test have been performed. Since data was not normally distributed, it was converted using two step approach for transforming variables (Templeton, 2011). Various diagnostic tests such as linearity of relationship between the variables, Durbin Watson test to check autocorrelation, homoscedasticity test, multicollinearity test and multivariate normality tests have been conducted before applying hierarchical multiple regression.

Table 2 reports descriptive statistics for variables under research. Mean score of ROA of 0.67 percent indicates efficient utilization of assets by the banks. Similarly, mean score of ROE of 4.72 percent

suggests ability of management to create value for shareholders. However, weak mean score of environmental performance of 29.3 percent suggests that environmental performance is yet at early stage in Indian banking sector (Rajput et al., 2013). Though, increase in environmental practices require banks to reshape fundamental business model (Bimha & Nhamo, 2017) and integrate green practices into their core operations, it is yet to be regarded as a strategic tool of Indian banking sector (Maqbool & Zameer, 2018).

Table 2: Descriptive Statistics.

Variable	Mean	Standard Deviation	Min	Max	N
ROA	0.67	0.94	-1.13	3.03	83
ROE	4.72	8.90	-20.41	20.51	83
Environmental Performance	29.3	31.77	0	100	83
Size (Log Total Assets)	7.04	2.23	3.92	11.28	83
Financial Leverage	1.25	1.67	0.00	7.67	83
Capital Intensity	0.77	0.65	0.01	4.65	83

Source: Authors' calculation

Table 3 exhibits model summary of hierarchical multiple regression to analyze the relationship between environmental performance and ROA. Durbin Watson statistic of 1.634 (close to 2) indicates that residuals are independent (Field, 2008). Control variables (size, financial leverage and capital intensity) have been entered in step 1 to eliminate the impact of these factors. R square value in step 1 suggests that control variables account for 7.2 percent of variance in ROA. In step 2, environmental performance has been entered to help determine the relationship between environmental performance and ROA after controlling all other factors. R square change value of less than 0.05 in step 2 indicates that environmental performance leads to no variance in ROA when effect of all control variables has been statistically controlled. Sig. f change value .862 (>.05), indicates that environmental performance has statistically no significant contribution to predict ROA.

Table 3: Model Summary of Hierarchical Multiple Regression predicting ROA.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.268	.072	.035	.92699	.072	1.937	3	75	.131	
2	.269	.072	.022	.93304	.000	.030	1	74	.862	1.634

Source: Authors' calculation

Table 4 reports the findings of regressing environmental performance on ROA after adjusting effects of control variables. Tolerance value of more than 0.1 (Kayri, 2010) and VIF value of less than 10 (O'Brien, 2007) signify absence of multicollinearity amongst the variables. Coefficient of environmental performance is negative and insignificant with ROA at significance level of 0.05. Outcome reveals that increase in environmental performance does not lead to any change in ROA of the banks. Results reject H1 and indicate no significant relationship between environmental performance and financial performance, thereby clearly corroborating results of prior studies (Aggarwal, 2013; Alikhani & Maranjory, 2013; Freedman & Jaggi, 1982).

Table 4: Summary of Hierarchical Multiple Regression analysis predicting ROA.

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		1.664	.100		
	Size (Log total assets)	.158	1.298	.198	.831	1.204
	Financial leverage	-.221	-1.754	.084	.782	1.279
	Capital Intensity	-.223	-1.934	.057	.931	1.074
2	(Constant)		1.660	.101		
	Size (Log total assets)	.159	1.292	.200	.830	1.204
	Financial leverage	-.214	-1.627	.108	.723	1.383
	Capital Intensity	-.212	-1.615	.111	.726	1.378
	Environmental Performance	-.022	-.174	.862	.753	1.327

Source: Authors' calculation

Note: *significant at p < 0.05

Table 5 exhibits model summary of hierarchical multiple regression to analyze the relationship between environmental performance and ROE. Durbin Watson value of 1.368 signifies that residuals are independent (Field, 2008). Results reveal that control variables account for 8.6 percent of variance in ROE. R square change statistic of .001 in step 2 indicates that environmental performance explains only an additional .001 percent of variance in ROE when effect of all control variables has been statistically adjusted. Sig. f change value 0.762 (>0.05), indicates that addition of environmental performance has statistically no significant contribution to predict ROE.

Table 5: Model Summary of Hierarchical Multiple Regression predicting ROE.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.293	.086	.049	8.44529	.086	2.341	3	75	.080	
2	.295	.087	.037	8.49687	.001	.092	1	74	.762	1.368

Source: Authors' calculation

Table 6 reports the results of regressing environmental performance on ROE after adjusting effects of size, financial leverage and capital intensity. Tolerance value of more than 0.1 (Kayri, 2010) and VIF value of less than 10 (O'Brien, 2007) signify absence of multicollinearity amongst the variables. Amid control variables, only size of the bank is found to have positive significant relationship with ROE at significance level of 0.05. Insignificant positive coefficient of environmental performance indicates that ROE is not sensitive to environmental performance. Results do not support H2. It implies no significant relationship between environmental performance and ROE, thus validating the findings of prior studies (Malarvizhi & Matta, 2016; Freedman & Jaggi, 1982; Chen & Metcalf, 1980).

Table 6: Summary of Hierarchical Multiple Regression Analysis predicting ROE.

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		.089	.930		
	Size (Log total assets)	.254	2.100	.039*	.831	1.204
	Financial leverage	-.089	-.715	.477	.782	1.279
	Capital Intensity	-.199	-1.736	.087	.931	1.074
2	(Constant)		.074	.941		
	Size (Log total assets)	.254	2.082	.041*	.830	1.204
	Financial leverage	-.100	-.767	.446	.723	1.383
	Capital Intensity	-.217	-1.666	.100	.726	1.378
	Environmental Performance	.039	.304	.762	.753	1.327

Source: Authors' calculation

Note: *significant at p < 0.05

5. Conclusion

Since banks play an intermediary role in an economy by financing various sectors of an economy, climate change and related environmental risks arises a need for banks to measure environmental performance in view of their environmental sustainability (Bimha & Nhamo, 2017). Hence, this research has attempted to analyze the environmental performance and its impact on financial performance in the context of Indian banking sector using hierarchical multiple regression. Results indicate environmental practices are still in preliminary stage in Indian banking sector. It could be due to requirement of massive investment for environmental initiatives which put a constraint on profitability (Hart & Ahuja, 1996; Worrell et al., 1995) or due to lack of mandatory environmental reporting legislations by banks in India. Literature also reveals that banks in countries like Austria, France, Germany, Italy, Norway, Sweden and United Kingdom which are proactive in environmental legislations score more on environmental performance (Bimha & Nhamo, 2017).

Research demonstrate no significant relationship between environmental performance and financial performance measured in terms of ROA and ROE, thereby supporting neo classical theory that fundamental responsibility of business towards society is maximize shareholder value (Muhammad et al., 2015). Findings explicitly validate the results of previous studies (Naila, 2013; Sarumpaet, 2005). However, the argument of no significant relationship is contrary to other studies. Studies (Haninun et al., 2018; Russo & Fouts, 1997) suggest a positive association between environmental and financial performance; and studies (Lioui & Sharma, 2012; Chen and Metcalf, 1980) propose a negative association between environmental and financial performance. To sum up, environmental performance by banks might not have any significant impact on financial performance, some other variables might influence the profitability of Indian banking sector (Rajput et al., 2013).

6. Implications

6.1. Theoretical Implications

Findings of this research provide theoretical implications for managers of Indian banking sector. In accordance with neo classical agency theory, research emphasizes on environmental practices to be an added expense that would not contribute towards financial performance. Consequently, less involvement in environmental activities would facilitate banks to save costs and eventually result in more profits. This research would also facilitate managers to work in the best interest of shareholders and focus on value creation by maximizing shareholders' returns. It would eventually result in increase in stock prices of the banks.

6.2. Practical Implications

Findings of this research would have practical implications for users and readers of financial statements. It would enable them to have better understanding about involvement and extent of disclosure towards environmental practices by banks. Besides, research has practical implications towards policy and regulatory development in Indian banking sector. Being a service sector industry, though banking operations do not pose direct severe threat to the environment, yet the indirect impact is a matter of concern. More the credit made available by banks in the economy, more is a tendency to employ it for projects having severe implications on environment. Since, there is lack of mandatory environmental standards and legislations; it calls for policy makers to establish mandatory environmental legislations for reporting on environmental practices in order to improve non financial disclosure in Indian banking sector.

7. Limitations and Future Scope of Research

Present research is subject to certain limitations and provides avenues for future research. First, time frame of research is five years (2013-14 to 2017-18), which is fairly short. To attain more vigorous results, future research could be conducted for longer duration. Second, only two financial variables namely ROA and ROE have been used. Future research could utilize more financial variables to verify the robustness of these results and obtain broad insight on relationship between

two constructs. Third, content analysis was applied to extract information about environmental performance by banks according to GRI framework. Disclosure on environmental performance based on GRI framework is voluntary; banks may be disclosing only positive information which needs to be considered. Future work could emphasize on the quality of disclosure, i.e. positive information vs. negative information. Fourth, current research emphasizes only on banking sector. Cross-sectional analysis of environmental performance and its impact on financial performance of banking sector with other sectors could be considered.

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