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The Nexus between Environmental Conservation Awards and Firms' Profitability: A Step towards Green Investment

Praveen Kumar

Chitkara Business School, Chitkara University, Punjab, India
E-mail: praveen.kumar@chitkara.edu.in

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Abstract: The present study provides evidence of the link between environmental conservation awards in form of carbon credits and the firm's profitability. This investigation is based on firms, which use to disclose revenues generated from the carbon credits in their annual reports. By using sample firms' data from 2011 to 2015, the results of the study reveal that carbon revenue significantly affects sample firms' profitability. More specifically, earning of the shareholders are affected most by the trading of carbon credits because it affects the profitability and therefore the amount left for the shareholders will be less if they do not include the carbon credits. Like in Gujarat Fluorchemicals Ltd the EPS for the year 2014-2015 would have been decreased by 112.94% due to the decrease in the sales by 42.35% if the company would have ignored the revenues from the carbon credits. The findings of this study are of considerable importance to strategic policy makers, firms and other stakeholders.

INTRODUCTION

In recent years, global warming becomes one of the most debating issues at international level. The mean temperature of the global surface has risen by more than 0.7°C over the last century and will continue to increase in the future (The Climate Group, India Report, 2010). On the global level, 72 percent of greenhouse gas emissions are from household usage covers emissions through cooking, heating, personal transport, electricity generation, etc., 10 percent of government consumption covers emission through defence research, power consumption, etc., and 18 percent of investments cover infrastructure development, building construction, machine installation, other capital goods etc. respectively (Hertwich and Peters, 2009).

GHGs emission has its negative impact on our ecological system. Consequently, it captured the attention of governments of different

countries, environmentalist, strategist, policymakers, society, leaders and academicians as well. Moreover, climate change is the defining challenge of our age. It is one of the most significant emerging risks facing the world today, presenting huge challenges to the environment and to global and local economies. Taking note of steep diminishing in ecological environmental quality at international level and to promote green investment practices, the concept of Carbon Credit comes into existence, which seeks to the transformation of the environmental threats into a money making opportunity.

Carbon Credits are an allowance that certain companies have, for reducing the carbon dioxide emission into the environment. Carbon credits, unlike the dollars, rupees and Euros that trade for physical goods and services, are a new money exchange intended to reduce pollution, particular emissions of carbon dioxide that is caused by burning fossil fuels. Carbon credits are a key component of national and international attempts to mitigate the growth in concentrations of GHGs. One Carbon Credit is equal to a tonne of carbon. There are two broad methods of earning carbon credits. Carbon Offset Credits, which consist of clean forms of energy production, the wind, solar, hydro and biofuels and Carbon Reduction Credits which comprise the collection and storage of carbon from the atmosphere through bio-sequestration (reforestation, forestation), ocean and soil collection and storage efforts.

In order to reduce emissions of six GHGs (greenhouse gases) namely, 'Carbon dioxide (CO2)', 'Methane (CH4)', 'Nitrous oxide (N2O)', 'Hydro fluorocarbons (HFCs)', 'Per fluorocarbons (PFCs)' and 'Sulphur hexafluoride (SF6)' by 5.2 percent from the 1990 level, the UNFCCC (United Nations Framework Convention on Climate Change) adopted an environmental treaty (Kyoto Protocol) in 1997. It comes into existence on 16th February 2005. The laws and regulations for the execution of the Kyoto Protocol were further elaborated in the Marrakesh Accords. The UNFCCC enjoys near-universal membership with 192 parties. Parties of Protocol can trade their carbon emission under 3 flexibility mechanisms named, Emission Trading (ET), Joint Implementation (JI) and Clean Development Mechanism (CDM). ET is explained in article 17 of the Kyoto Protocol. ET is like an open market system under which any of the countries can sell and buy emissions to accomplish their respective targets to reduce their pollution committed under the treaty.

The Protocol builds a cap-and-trade system that sets caps on the GHGs emissions of developed economies. As per the emission targets of the party, it is assigned the corresponding number of allowances called Assigned Amount Units (AAUs). If in a case of countries emit less CO2 than its cap

assigned, then they can sell their cap to those parties, which are unable to meet their emission targets. Joint Implementation (JI) is an another flexibility mechanism comes under article 6 of Kyoto Protocol, which is somehow similar to CDM that allows industrialised countries, in order to meet their emission targets committed under Kyoto Protocol, to invest in low carbon technologies/projects, in other industrialised countries. JI produce Emission Reduction Unit (ERU). Clean Development Mechanism (CDM) is one of the key instruments developed under the Protocol to facilitate carbon trading. It is defined under Article 12 of the Protocol, which emphasis on the concept of sustainable development through investment in those projects which emit less CO2 into developing parties by developed parties. While creating GHGs statements a country committed under Kyoto Protocol, which has its surplus emission quota, may sell to developed parties which might be unable to meet their emission targets under the Protocol and units created under CDM called as Certified Emission Reductions (CERs) units.

On Nov 26, 2013, Mexico's stock exchange, first exchange in the world, inaugurated carbon credits trading, a voluntary initiative that allows polluters to offset their emissions with tradable certificates. MEXICO2 also seeks to have investors fund environmental projects aimed at curbing greenhouse gases. Currently, there are six major exchanges trading in carbon allowances at international level, named Chicago Climate Exchange, European Climate Exchange, NASDAQ OMX Commodities Europe, Power Next, Commodity Exchange Bratislava and the European Energy Exchange.

Carbon trading can influence firm's profitability in the market. The carbon trading system gives the financial value to each tonne of emissions saved. Carbon credit revenue can affect a firm cash inflow in future and alter the firm's profitability and stock market return. This study analyses whether and to what extent Carbon credit revenue may be linked with sample firms' profitability.

CARBON TRADING IN INDIA

India is the 4th largest emitter of CO2 with 6.96% of world's total emission and has huge chance to convert this into wealth creation. Being a part of Kyoto Protocol India can be able to fulfil the target to reduce CO2 of developed countries. This will make Indian economy to reach up to new heights. Carbon Credit has now become full-fledged commodity at international level. Multi Commodity Exchange (MCX) commenced buying and selling of carbon through a future contract in January 2008 after Government of India accepted carbon credit as commodities (Birla et. al., 2012).

Indian carbon credit markets are largely forced by small and medium enterprises (SMEs); it's not surprising, as India has nearly three million SMEs which constitute more than 80 percent of the total number of industrial enterprises in the country. BSE has created history on July 1, 2012, by launching the Green Index called Greenex. This is India's first carbon-efficient live index. The index has been developed by the BSE in collaboration with IIM Ahmadabad. BSE Greenex will measure the performances of companies in terms of Carbon Emissions. MCX is India's largest commodity exchange, which is launched with the purpose of futures trading in carbon credits. In 2005 alliance with Chicago Climate Exchange CCX and the European Climate Exchange MCX enter into carbon credits sector in India. The Indian exchange also expects its tie-up with CCX in order to enable Indian firms to get better prices for their carbon credits through integrating with rest of global markets to foster best practices in emissions trading. NCDEX is another commodity exchange in India on eleventh April 2008, it also has commenced futures contract trading of Carbon Credit.

India is a serious and emerging player in the global carbon credits market (Kumar, 2016). The UNFCCC has registered 4559 projects under CDM as on 04th September 2012. Out of total registered project, 3164 pertains to the India and China only, which are completely developing countries. This constitutes 69.48 percent of the total registered project. In terms of CERs, total expected CER for 4559 projects is 638,348,703 as on 04th September 2012. The CERs allocated for the project registered of India and China is 479,885,761, which constitutes 75.18 percent of the total CERs. The registration for CDM projects is increasing year to year. In 2004, only 4 projects were registered, it has been increased to 2091 at the end of December 2011. In 2012, up to August 2012, itself 1696 CDM projects has been registered so far. The growth rate in the registration of the projects is 289.14 percent, excluding the projects registered during 2012.

PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

Existing literature exhibits a positive relationship between firms' environmental performance and their financial performance. Murphy (2002) in his review demonstrate that positive environmental performance, in terms of less carbon emission into the atmosphere and their proper disclosure in books of accounts, improve company's financial performance, in terms of profits, revenue and market value and negative environmental performance have their negative impact, in terms of decreased profits and market value. On the other hand, low-carbon technologies investment, proper emission disclosure and compliance with environmental

regulations, produces a favourable return on equity (ROE) and return on assets (ROA) and have a more positive return on their stock. Furthermore, study specifies poor environmental performer companies are less profitable and have a weaker return on their stock.

In the same line, Clarkson et al. (2008) reveal that good environmental performer firms enjoy the benefits to over compliance. On the other hand, poor environmental performer firms have less profit and decreased market value. Moreover, Chapple et al. (2013) argue that this unfavourable economic performance of the emission-liable firm is considered as a charge against polluting the environment. Sharfman and Fernando (2008) investigate the relationship between environmental risk management and the cost of equity using S&P 500 firms. This article predicted that the better the company's environmental risk management, the better its environmental performance.

Oberndorfer, (2009) reveals that EUA return volatility and European electricity stock volatility are positively related. More specifically, EUA price increases (decreases) positively (negatively) affect stock returns from the most important electricity corporations covered by the EU ETS. However, the effect differs from country to country: Amongst the electricity corporations considered, Spanish corporations are shown to exhibit a negative EUA-to-stock market relationship. In contrast, the effect is positive for corporations from other countries such as Germany and the UK. Stock markets do not seem to react differently to EUA appreciations in comparison to depreciations. Moreover, electricity stock return and EUA price change volatility are not shown to be positively related. Given these results, it becomes apparent that EU ETS effectively has an impact on financial (stock) markets and therefore has economic consequences, affecting the value of the corporations covered.

In this vein, Guenster et al. (2010) also find that eco-efficiency relates positively to operating performance and market value. Moreover, market's valuation of environmental performance has been time variant, which may indicate that market incorporates environmental information with a drift. In a subsequent study, Sandeep (2013) found that carbon trading assists to convert an environmental threat into revenue generating opportunity and lowering the overall cost of meeting carbon reduction. Delhi Metro Rail Corporation was the first registered Railway project in the world by United Nations under the CDM which enabled it to claim carbon credits for the use of regenerative braking system in its rolling stock. The project was financed by Japan and the carbon credits earned by DMRC also purchased by Japan at a rate of 1.2 Crore p.a.

In addition, Bhanawat, & Vardia (2015) analysis the contribution of carbon revenue in firms' profitability. On an average, the sample units could be able to provide only 6.84 percentage of total revenue. If carbon credit revenue of two companies viz. Gujarat Fluorochemicals and Rana Sugar Ltd. are excluded from the sample average come 0.776%. Finally, this paper concluded that there is a significant difference between the average value of revenue earned from carbon credit transactions of different years of sample units.

More recently, Gabbi et al. (2015) reported that revenue obtained from the sale of carbon credits positively affected the financial results of the company. At the initial outlay of CDM project, the company was negative in its profitability indicators, however, over the years the investments began to generate revenue, demonstrating the trend that the values obtained with CO2 commercialization remunerate the investments over time.

Hence, the discussion above leads to the hypotheses that:

H1: Environmental conservation awards affect firm's profitability.

RESEARCH METHODOLOGY

This study collects carbon credit information and profitability data from multiple sources to check how much the sales, profits after tax, profit before tax and earnings of the shareholders will get affected if the company ignores the revenues generated from the carbon credits. To analyses carbon credit's effect on profitability, we obtained Indian firm carbon credit announcement information from MoneyControl. MoneyControl is an Indian business news and online trading website. We searched MoneyControl w.r.t. announcements of carbon credit in the five-year period 2011 to 2015. Moreover, I limited my search to Economic Times 500 firms for 2015 because it consists of the 500 largest and most liquid Indian firms. Our search in MoneyControl contained the relevant keywords such as Certified Emission Reductions, Carbon trading, Green Initiatives, Carbon Credit and Clean Development Mechanism.

After eliminating firms which were not covered in ET 500 list, I obtained 30 firms whose carbon credit issuance information was available on MoneyControl during the sample period. However, this study excluded carbon credit issuance information published on other news databases and sources. Finally, we randomly selected four firms out of 30 firms with the help of random function in excel. Therefore, the scope of this study is limited to four firms named Tata Power company Ltd, Torrent Power Ltd, Gujarat Fluorchemicals Ltd and Tamil Nadu new print and paper Ltd. Further, the relevant information related to carbon credit revenue, sales, profits after

tax, profit before tax and earnings are being taken from annual reports of the firms. Then Iwetested my prepositions using percentage change.

EMPIRICAL FINDING AND DISCUSSIONS OF THE STUDY

Tata Power Company limited

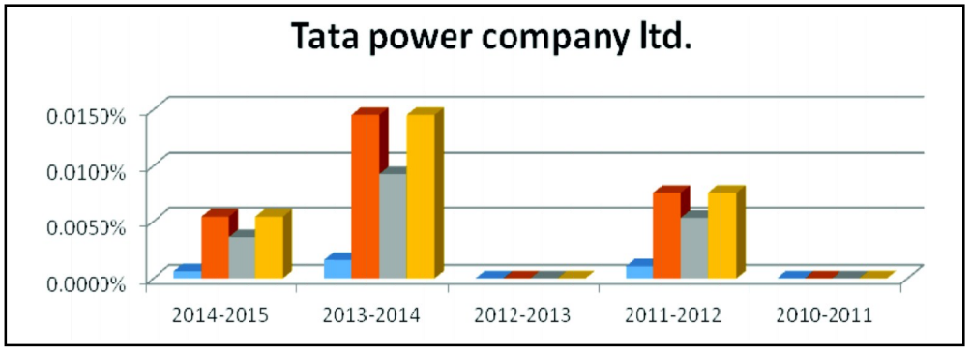
The Table 1 depict that in the year 2014-2015 revenues generated from carbon credits were Rs.5 lakhs. If we ignore carbon revenue sales decrease by 0.006% and the EPS becomes Rs 3.7 from Rs. 4. Resultant, change in the earnings can influence the share price of the company. In the year 2013-2014, the revenues from CER's were 14 lakhs which affected the Sales and profitability before and after tax simultaneously. The EPS decreases by 0.015% and the percentage change in sales were 0.016% and in profitability, it was 0.0145%, whenever I did not consider the carbon credits. In the year 2014-2015, Earning per share decreases by .008%, without carbon credits.

Table 1

tata power company ltd.

Year	Revenue from CERs	With Carbon Credits				Without Carbon Credits				Percentage Change			
		Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS
	in lakh	in lakh				in lakh							
2014-2015	5	867769	101029	151565	4	867764	101024	151560	3.7	0.0006%	0.0054%	0.0036%	0.005%
2013-2014	14	862704	95408	149116	4	862690	95394	149102	4.0	0.0016%	0.0145%	0.0093%	0.015%
2012-2013	0	956728	102469	170338	4	956728	102469	170338	4.3	0.0000%	0.0000%	0.0000%	0.000%
2011-2012	9	849584	116973	168287	5	849575	116964	168278	4.9	0.0011%	0.0077%	0.0053%	0.008%
2010-2011	0	691848	94149	111182	40	691848	94149	111182	39.7	0.0000%	0.0000%	0.0000%	0.000%

Figure 1



Torrent Power Ltd

In the year 2014-2015 company generated Rs 2 lakh from the sales of carbon credits and if carbon credits were not taken into consideration then sales were decreased by an amount of revenues generated from the sale of carbon credits and the profitability and EPS got affected by 0.002% and 0.02% (Table 2). In 2012-2013 the sales and profitability were Rs 8129874 lakh and Rs.

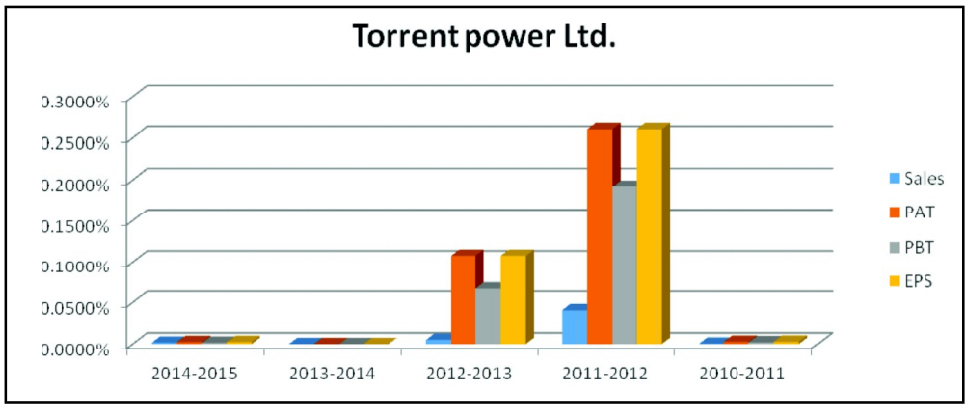
38496 lakhs respectively but whenever carbon revenue was not taken into account it was reduced by 0.0051% and 0.1077%. In 2011-2012, Earning per share decreased by 0.260% whenever carbon credits were not taken into account which is material and can affect the goodwill of the company as well as the share price of the company.

Table 2

torrent power ltd.

Year	Revenue from CERs	With Carbon Credits				Without Carbon Credits				Percentage Change			
		Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS
	in lakh	in lakh				in lakh							
2014-2015	2	102739	74206	110905	16	102737	74204	110903	15.7	0.0017%	0.0024%	0.0016%	0.002%
2013-2014	0	857562	9484	24644	2	857562	9484	24644	2.0	0.0000%	0.0000%	0.0000%	0.000%
2012-2013	41	812987	38496	62274	8	812946	38455	62233	8.1	0.0051%	0.1077%	0.0666%	0.108%
2011-2012	322	791782	123746	167925	26	791460	123424	167603	26.1	0.0406%	0.2600%	0.1916%	0.260%
2010-2011	3	682828	106572	142839	23	682825	106569	142836	22.6	0.0004%	0.0028%	0.0021%	0.003%

Figure 2



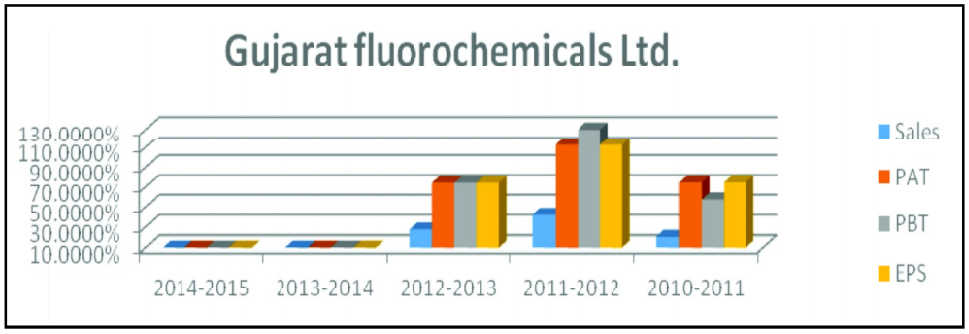
Gujarat Fluorchemicals Ltd

From the given table 3 it can be observed that when there were no revenues from CER's in initial years the sales and profitability remains almost same but in the year 2013-2014 the sales were Rs.114094 lakhs when carbon credits were taken into account and it changed to Rs. 114036 lakhs. When we ignore the revenues from CER's sales decreased by 0.05% and in the case of profitability there were also slight change and EPS decreased by 1.55%. In 2012-2013, the Earning per share decreases by 74.38 % without carbon revenue which is the most important variable in determining the share's price. Hence the results show that the carbon credits plays an important role in determining the profitability and earnings per share of the company. Similarly, in the year 2011-2012, the Gujarat Fluorchemicals Ltd earns maximum revenues from the carbon credits that were Rs. 87614 lakhs which were significantly affected the profits of the company.

Table 3

Gujarat Fluorochemicals Ltd													
Year	Revenue from CERs	With Carbon Credits				Without Carbon Credits				Percentage Change			
		Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS
	in lakh	in lakh				in lakh							
2014-2015	0	132097	66712	43754	61	132097	66712	43754	61	0.0000%	0.0000%	0.0000%	0.00%
2013-2014	58	114094	22656	9785	21	114036	22598	9727	21	0.05%	0.26%	0.59%	0.26%
2012-2013	44169	159608	59384	59428	50	115439	15215	15259	13	27.67%	74.38%	74.32%	74.38%
2011-2012	87614	206900	77577	65188	71	119286	-10037	-22426	-9	42.35%	112.94%	134.40%	112.94%
2010-2011	20213	98285	27054	35149	25	78042	6811	14906	6	20.60%	74.83%	57.59%	74.83%

Figure 3



Tamil Nadu new print and paper limited

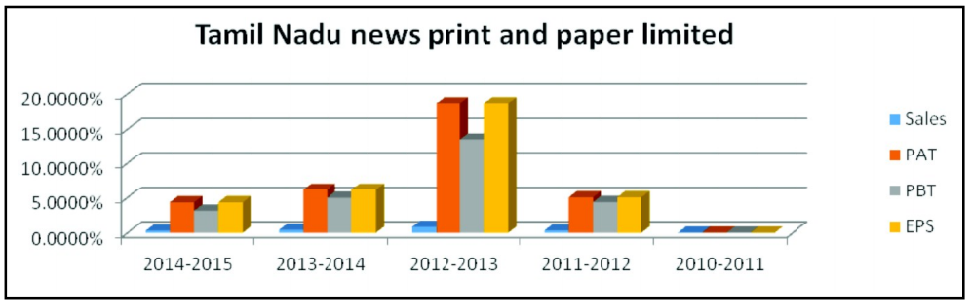
The Table 4 shows that in the initial year when revenues from CER's were Rs. 723 lakhs the sales decreased by 0.3118% whenever I ignored the carbon credits. In 2013-2014 the sales and profit after tax were Rs. 244817 lakhs and Rs. 16118 lakhs respectively with carbon revenue. However, without carbon credits sales and profit after tax decreased by 0.40% and 6.22%, resultant, EPS decreased by 6.22%. In 2012-2013, the percentage change in Earning per share was 18.663%, in this year the company earns maximum revenue from carbon credits as compared to the last three years. Similarly, in 2011-2012, the company earns revenue of Rs 548 lakh from carbon credits which were significantly affected the sales of the company.

Table 4

TNPL(tamil nadu news print and paper limited)

Year	Revenue from CERs	With Carbon Credits				Without Carbon Credits				Percentage Change			
		Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS	Sales	PAT	PBT	EPS
	in lakh	in lakh				in lakh							
2014-2015	723	231884	16673	23013	23	231161	15950	22290	22	0.3118%	4.3364%	3.1417%	4.336%
2013-2014	1003	244817	16118	20268	22	243814	15115	19265	21	0.4096%	6.2217%	4.9478%	6.222%
2012-2013	1705	203514	9148	12611	12	201809	7443	10906	10	0.8375%	18.6326%	13.5161%	18.633%
2011-2012	548	161639	10894	12511	15	161091	10346	11963	14	0.3391%	5.0309%	4.3807%	5.031%
2010-2011	0	124549	149	19515	21	124549	149	19515	21	0.0000%	0.0000%	0.0000%	0.000%

Figure 4



Carbon trading: A step towards green investment

Carbon trading is relatively an emergent field of research. It enlightened the environmental problems and ecological health of our planet. It aims to fulfil twin objective, first achieve sustainable development through emissions reduction and second give a financing strength to developing countries by way of providing a platform for sale their emission quotas. There are tremendous opportunities exist for the world in this new business segment, which may be expected to flourish with an exponential rate in upcoming few years.

Moreover, in the wake of growing global warming concerns, the business community has also been recognised GHGs emission as one of the important environmental issues under strategic management (Lee at al., 2015). Companies use to develop plantation and greenery not only to earn income through emission reduction but also to become a responsible corporate citizen and to create an environment-friendly setup to earn the faith and trust of society in order to ensure long-run survival. Resultant, firms with better environmental management practices have a less environmental risk exposure, a good reputation, and high customer loyalty (Murphy 2002).

Green investment can play a strategic role in the arena of growing concern about environmental protection and sustainable development practices. The world has recognised this potential since the implementation of Kyoto Protocol and the European Union Emission Trading Schemes (EU-ETS). Sustainable development practices have especially aided the transformation of the world towards a low-carbon economy. Green investment often reflects the future of the earth, the preservation of nature and the disappearing harmony between human beings and nature. This contemplation has led to the conviction that environment, environmental regulations and finance must unit in order to ensure a sustainable and pollution-free existence of our planet (Kumar, 2016). The present age and

the future generation demand this transformation. CDM investment can help to prevent our ecological system through promoting low carbon technology. It provides opportunities to firms to generate emission credits by implementing environment-friendly manufacturing processes that cut the emission of greenhouse gases at the factory. These measures are designed to cut the emission of gases like CO2, reduce consumption of energy, promote waste heat recovery, use renewable energy, implement effluent treatment systems at the factory. Now a day's carbon credit is emerging domain especially in India but there is very few corporate who are aware of this emerging segment of credits. Presently it is essential to create awareness about this emerging business segment.

Carbon trading can help government and Industrials to generate money and a pollution free environment to the living being. Furthermore, it can also help to employment generation in developing economies. More specifically, Carbon trading can provide a country with both monetary and non-monetary benefits. The expected benefits of carbon credit are as follow:

- The biggest advantage of carbon credit is that it helps in reducing the global warming because this is being implemented across the world.
- Energy saving and sustainable development practices become more popular because of the awareness generated by carbon credits.
- It helps the companies in developing the world in generating extra income from carbon credits, which can give a financing health to developing countries. India earned 24,012,956 carbon credits from registered approximately 3000 projects with UNFCCC up in 2012 (National CDM authority of India). Currently, carbon credits are valued at approximately € 30 per metric tonne.
- It is also an alternative investment for people who are looking for some innovative investments.

CONCLUSION

The result of this study reveals that carbon revenue significantly affects sample firm's profitability. More specifically, earning of the shareholders are affected most by the trading of carbon credits because it affects the profitability and therefore the amount left for the shareholders will be less if they do not include the carbon credits. Like in Gujarat Fluorchemicals Ltd the EPS for the year 2014-2015 would have been decreased by 112.94% due to the decrease in the sales by 42.35% if the company would have ignored the revenues from the carbon credits. From this, we can estimate how badly the share price would have been affected and there will be a

decrease in the share price. In the case of Tamil Nadu new print and paper Ltd., the EPS would have been decreased by 18% in 2012-13 if the accounting of credits has not been done. The findings of this study are of considerable importance to strategic policy makers, firms and even societal well-being. In fact, the understanding of the impact of greener practices on firm profitability helps policy makers in the evaluation of the costs and benefits of adopting sustainability practices. This study analyses four firms using percentage change for five years. Therefore, future research should provide a longitudinal analysis of the large sample to investigate the long-term effects of carbon credit announcement on firm's position in the capital market.

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