

AN ANALYSIS ON CARBON CREDITS (INDIA)

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ABSTRACT

The following article tries to examine study of carbon credits effect on stock market. Also this article attempts to investigate relative factors which influence stock market in India. The following are the different determinates which we have considered like Carbonex, greenex, powered, msci, population, gold, exports, imports, iip.

In India carbon credit decision are taken by Kyoto protocol under united national frame work of climate change (UNFCC).Any fluctuations on population, pollution, iip, etc. will impact on carbon credits. During this analysis we have taken determinants which effects directly or indirectly on stock market returns.

KEY WORDS: Carbon credit, Exports, Greenex, Gold, IIP, Msci, Powerex.

INTRODUCTION:

The issue of climate change and global warming became the topic of international concern since from 1980s because of increase in the earth's temperature. The effects of this climate change are already being felt around the world. If this continues over the next century it may cause rises in sea level, changes in the weather events such as heat waves and diseases particularly in developing countries. The Kyoto protocol is a first international attempt to address the issue seriously.

KYOTO PROTOCOL: The Kyoto protocol is an agreement made under the United Nations framework convention on climate change (UNFCC) in 1997. Kyoto protocol is a voluntary treaty signed by 141 countries. This protocol legally binds the parties (industrialized countries) to the protocol to reduce their green house gas emissions. This protocol defines mechanisms like emissions trading and clean development mechanism that allow industrialized nations to meet their green house gases (GHG)obligations by buying GHG reduction credits from other countries, and make profit by trading the carbon credits.

It means that if a country cannot meet its green house gas reduction target, it can buy credits from other countries that have credits in excess. As a result carbon has become a commodity, which like other commodities, is traded in open market, called carbon market.

The Carbon Credits: Carbon credits (often called a carbon offset) are certificates issued to countries that have successfully reduced emissions of GHG which causes global warming. Carbon credits (or) certified emission reductions are a certificate just like a stock. This can be used by governments, industry or private individuals to offset damaging carbon emissions that they are generating. Carbon credits create market for reducing green house emissions by giving a monetary value to the cost of polluting the air.

Each carbon credit represents one tonne of co₂ either removed from the atmospheres or saved from being emitted. Carbon credits can be created in many ways but there are 2 broad types.

1. Sequestration (retaining or capturing co₂ from the atmosphere) such as afforestation & reforestation activities.
2. Co₂ saving projects such as the use of renewable energies (wind power, solar energy, biomass power, hydel power).

Carbon credits can be viewed as a means of empowering the market to care for the Environment. carbon credits can be bought and sold in international markets at prevailing market price.

OBJECTIVES:

- To find the performance measure of carbonex and sensenx.
- To know the impact of oil and gas and power on carbonex.
- To know the impact of industrial production on carbonex.
- To find the performance measure of greenex and carbonex.
- To study the evolution of carbon credits in India and around the globe.

Limitations:

- Indian carbon credits have been taken from the year 2010
- Internal carbon credits have been taken from the year 2003
- Factors values are converted to averages
- Impact have been measured in longer run (yearly)

LITERATURE REVIEW

Abstracts

Benjamin J. Richardson:

Climate finance is becoming an important feature of the emerging legal and policy regimes to address global warming. However, the current approach largely confines the financial sector to a transactional agent to mobilize capital for clean energy and to broker emission allowance trading. The sector's potential to leverage more sweeping positive changes in the economy as sought historically through the movement for socially responsible investment (SRI) has been insufficiently acknowledged. Indirectly, by regulating greenhouse gases the legal system is helping to create a business case for investors to respond to climate change threats. However, the potential contribution of SRI to address climate change problems more comprehensively is presently limited owing to inadequate governance frameworks, as well as the sector's increasing abandonment of its traditional ethical agenda.

Manish Sachdev:

In 1997, Kyoto Protocol, a voluntary treaty was signed by 141 countries to reduce the emissions of Global House Gases by 5.2% below 1990 levels by 2012. Certified Emissions Reductions (CE

R) or Carbon credits are certificates issued certifying reduction in emissions. The developing countries have been exempted from any such restrictions. These certificates can be traded in the market and purchased by firms which find purchasing emission credits to offset its emissions lower in cost. Thus an opportunity has emerged for firms in developing countries like India, Brazil and China to boost their earnings by complying with norms. These additional cash flows from sales of credits result in an incremental Internal Rate of Return by 27%. This has opened up a new source of cash flow in project financing making unviable projects viable by exceeding the hurdle rate for investment returns. It will be pragmatic on part of firms to consider this mode of cash flows in project financing.

Deepanshi Chaudhary: For several decades widespread concern has surfaced over the increase in disruptive anthropogenic processes and their role in radically altering the environment and ecosystems. With the advent of the Kyoto Protocol the world witnessed a dramatic intensification of interest in Climate Change Mitigation. Although this momentum was initially brought about to meet compliance targets, it soon gave way to private businesses, NGOs, investors and eventually individuals who took the initiative to change their prodigal ways. Parallel to the CDM projects market, runs another smaller yet burgeoning Voluntary Carbon market. Not bound by the rigorous procedures and high transaction costs, the Voluntary Carbon Market empowers a wider variety of organizations and individuals to take part in the mitigation process and sustainable future. Currently the Voluntary Carbon Market is estimated at \$330 million, trading volumes of 65 million tonnes of CO₂ with a growth rate of 240% in just one year. Experts predict this to grow exponentially to volumes of up to 1400 million tonnes of CO₂ being traded by 2020. (Hamilton May 2008) This report deals with issues pertaining to the Voluntary Carbon Market and its potential in the coming years. It discusses topics of additionality, validation and verification standards and registries.

Allwardt, Jennifer: The potential of using carbon offset credits from agroforestry projects for farmers in developing areas has become more prevalent in both Clean Development Mechanism and voluntary carbon markets. Since the implementation of the Kyoto Protocol, many international development organizations have been interested in using the Clean Development Mechanism (CDM) to help both mitigate CO₂ emissions through agroforestry projects offsets and as a poverty reduction tool. Few organizations that have begun talking with farmers about planting trees for carbon offset credits have been able to tell the farmers how much money they would receive from their new tree growth or the costs they will incur in doing so.

Mr. Dhaval Sharma: In 1996 the Kyoto Protocol established a global policy aimed at reducing green house gas (GHG) emissions. In response, slow steady steps are being taken to implement carbon emission limits. Markets are being established so that companies can exchange carbon allowances. Turning the environment, a public good, into private property presents many economic challenges. India comes under the third category of signatories to UNFCCC. India signed and ratified the Protocol in August, 2002 and has emerged as a world leader in reduction of greenhouse gases by adopting Clean Development Mechanisms (CDMs) in the past few years.

Data Base - Methodology:

Skewness: Skewness is indicator used in distribution analysis as a sign of asymmetry and deviation from a normal distribution if skewness is greater than zero it is a right skewed distribution which concentrates on left of the mean with extreme values to the right, if skewness is less than zero it is left skewed distribution which concentrates on right of the mean with extreme values to the left, if skewness is zero it is symmetric

$$skewness = \frac{\sum_{i=1}^N (Y_i - \bar{Y})^3}{(N-1)s^3}$$

Kurtosis: it is an indicator used in distribution analysis as a sign of flatterness or peakedness of a distribution, for kurtosis 3 is a base value, if kurtosis is greater than 3 it is leptokurtic distribution sharper than the normal distribution, if kurtosis is less than 3 it is platykurtic distribution flatter than the normal distribution, kurtosis is equal to 3 it is mesokurtic distribution it means it is normal distribution.

$$kurtosis = \frac{\sum_{i=1}^N (Y_i - \bar{Y})^4}{(N-1)s^4}$$

The kurtosis for a standard normal distribution is 3. For this reason, some sources use the following definition of kurtosis (often referred to as "excess kurtosis").

Correlation: A correlational study is a research writing that attempts to relate an event to another events or sets of causality which precipitate the event.

Slabs: 0-0.3 slightly correlated,
0.3-0.7 moderately correlated,
0.7-1 strongly correlated

Regression: A statistical measure that attempts to determine the strength of the relationship between one dependent variable (usually denoted by y) and the series of other changing variable (known as independent variable).

$$Y = a + bx$$

a = the intercept

b = the slope

x = the variable that are using to predict y

y = the variable that are trying to predict

Empirical investigation:

In this analysis we have dealt with correlation, skewness, regression, kurtosis, mean and median for below criteria's:

- Carbon credit and Greenex
- Carbon credit and Carbonex
- Carbon credit and powerex
- Carbon credit and lip
- Carbon credit and Msci
- Carbon credit and Gold
- Carbon credit and Exports
- Carbon credit and Imports

DATA ANALYSIS AND INTERPRETATION:**Average table:**

YEAR	greenex	carbon credit	iip	carbonex	powerex	msci	gold	exports	imports	population
2008	746.4259	0								
2009	1129.775	24.26538	168.2916	0	1329.075	1139.965	980.74	21097	6514	1139.965
2010	1546.498	3.47375	190.0416	999.5869	6292.851	1155.38	991.49	26476.03	6745.603	1155.38
2011	1463.257	1.635422	198.508	999.5869	4261.854	1210.2	1003.26	35400	9800	1210.2
2012	1454.751	0.167029	197.425	970.24	4354.833	1241.49	1017.373			1241.49
2013	1568.574	0.006698	211.766	990.685	2051.329		1021.123			

The above table describes, the impacts on each other. Greenex, Msci, Imports, Gold, Population, Powerex, Carbonex, impacts on Carbon credit. Population, Powerex impacts on Greenex. World Imports, World -Exports, Msci, Greenex impacts on Gold. Population, Exports, Imports, Iip, Greenex impacts on Msci. Powerex impacts on Population. Exports, Greenex impacts on Imports. Greenex impacts on Exports.

Correlation table:

	carbon credits	greenex	carbonex	powerex	iip	population	gold	exports	imports	msci
carbon credits	1									
greenex	-0.22861	1								
carbonex	-0.98803	0.962034	1							
powerex	-0.56202	0.585072	0.65944	1						
iip	-0.91573	0.934549	0.8696	0.204769	1					
population	-0.743828626	0.479755	0.642572	0.270421	0.813415	1				
gold	-0.80874	0.682937	0.710324	0.018958	0.813415	0.982568	1			
exports	-0.82953	0.655768	0.786467	0.467072	0.924649	0.985394	0.993281	1		
imports	-0.6131	0.386574	0.553685	0.166906	0.759034	0.989191	0.907177	0.949774	1	
msci	-0.973088968	0.9644539	0.987908	0.635418	0.862904	0.65202706	0.683519	0.864704	0.66409	1

In the above table the relationship between greenex and carbon credit is slightly negative correlated. The relationship between carbonex and carbon credit is strongly negative correlated. The relationship between powerex and carbon credit is moderately negative correlated. The relationship between iip and carbon credit is strongly negative correlated. The relationship between population and carbon credit is strongly negative correlated. The relationship between gold and carbon credit is strongly negative correlated. The relationship between exports and carbon credit is strongly negative correlated. The relationship between imports and carbon credit is moderately negative correlated.

SKEW TABLE:

	Carbon credit	greenex	powerex	carbonex	iip	population	msci	gold	exports	imports
Carbon credit	0									
greenex	0.076234	0								
powerex	0.964585	1.353969	0							
carbonex	0.484306	-1.56506	1.09695	0						
iip	0.022989	0.276183	1.017993	0.409868	0					
population	0.008523	0.577437	1.011067	-2.46981	0.01149	0				
msci	-0.3154	0.257327	0.971865	0.483547	0.048474	0.009319	0			
gold	0.001053	0.464997	1.261154	-3.14841	0.000286	0.277989	0.277989	0		
exports	0.341801	0.373756	0.388674	0.354284	0.345722	0.368864	0.368864	0.364553	0	
imports	0.305311	0.431247	-0.40503	0.322909	0.3188	0.41253	0.41253	0.393129	0.552545	0

The above table describes the relationship between greenex and carbon credit is right skewed because it's value is >0 that's why it is symmetric. The relationship between powerex and carbon credit is right skewed. The relationship between carbonex and carbon credit is right skewed. The relationship between iip and carbon credit is right skewed. The relationship between population and carbon credit is right skewed. The relationship between msci and carbon credit is negative right skewed and it is unsymmetric. The relationship between gold and carbon credit is right skewed. The relationship between exports and carbon credit is right skewed. The relationship between imports and carbon credit is right skewed.

KURT TABLE:

	carbon credit	greenex	powerex	carbonex	iip	population	msci	gold	exports	imports
Carbon credit	3									
greenex	-2.44518	3								
powerex	-0.48119	0.683333	3							
carbonex	-2.27338	3.400937	0.101524	3						
iip	-2.4695103	-2.02006	-0.34998	-2.18178	3					
population	-2.77844	-1.75017	-0.58132	6.500508	-2.76896	3				
msci	-2.77844	-2.10522	-0.46358	-2.2725	-2.46614	-2.77849	3			
gold	-2.56695	-2.05045	0.30979	9.935689	-2.56196	-2.01219	-2.01219	3		
exports	-2.28914	-2.18608	-1.85609	-2.2372	-2.27675	-2.20343	-2.20243	-2.21715	3	
imports	-2.32975	-1.85006	1.024702	-2.06454	-2.28264	-1.95081	-1.95081	-2.0207	-1.43312	3

The above table describes the value of greenex and carbon credit is <3 , it is less than the normal distribution. So it is platykurtic distribution. The value of carbonex and carbon credit is <3 , it is less than the normal distribution. So it is platykurtic distribution, . The value of carbonex and carbon credit is <3 , it is less than the normal distribution. So it is platykurtic distribution, The value of powerex and carbon credit is <3 , it is less than the normal distribution. So it is platykurtic distribution. The value of iip and carbon credit is <3 , it is less than the normal distribution

FINDINGS:

- Factors influencing the carbon credits are Msci, Imports Gold, Population, Powerex, Carbonex , Greenex.
- Factors influencing the Greenex are Population and Powerex.

- Factors influencing the Iip are Imports, Exports, and Greenex.
- Factors influencing the Gold are Imports, Exports, Msci, and Greenex.

Suggestions:

To create an awareness among the citizen on how to reduce the carbon emission or for to save the ecological system

- Regulation and exchange need to create awareness about the carbon credits to the investor's fraternity. India is gaining 32% shares on carbon emission in the world, but the Indian investors (equity) are not aware about the carbon trading system.
- In carbon credit \$ 4 billion worth of market. In the coming global years it is expected to touch \$ 100 billion. So there is a wide scope for the investment to create the wealth.

Conclusion:

In India carbonic is adopted by BSE through LSE in the year 2010. In the carbon emission business we are in a national stage. Most of the investors in carbonex market investing in equity. But this segment is also growing very fast compare to other segment in the secondary market.

There are some economical factors like IIP, oil and gas, power and population etc. are influencing the factors before taking a decision to enter this segment. There is scope for the further research to analyze the various economic factors which influence the carbon emission values. So that investor should take informed decision for his future investment in this segment.

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