

Carbon Trading Market: Viability for Islamic Financial Industry

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In response to global warming and growing emission levels countries have shown great concern to make efforts to reduce emissions. Under the Koyoto Protocol countries with higher level of emissions have developed a mechanism to buy credits from countries with low emissions. High levels of polluters are issued allowances by their national governments to cut down emission equal to the value of allowances issued. They are either to abate the emissions or to sell these allowances to companies or countries with low emissions, whichever is cheaper. The Emission Trading seems to be simple and a breakthrough in combating environmental problem but the mechanics of the trading are neither simple nor leading towards the right solution rather developed a trade scenario in which banks, derivative market players, speculators, brokers all are making their way to earn huge profits. This all is making the environmental problem worse. Alternate choices and methods are yet to be tested to run this trade with different parameters and instruments; one among them is the viability of Islamic financial instruments. The following study has given a critical review of the trading system based on western economic system, and highlighted the idea of introducing the Islamic financial instruments in the market of emission trading. There is a great scope for Islamic banks and financial industry to invest in carbon allowances, issue Sukuk bonds against the value of projects designed for Clean Development Mechanism, start Ijarah for abatement equipment and Musharika in Joint Implementation Projects. The study emphasized the need for an initiative for a carbon market based on Shariah compliant financial instruments and suggested a big push to launch the program to its fullest.

Key words: Carbon trading, western financial system, Shariah compliant financial instruments, Separate trading market

Introduction

With the passage of time environmental costs to GDP are increasing particularly in developing countries. In China, for example, State Environmental Protection Administration (SEPA) estimates that environmental degradation cost the economy equal to 10% of GDP per year. During the period of the 11th Five Year Plan (2006-2010), China's total investment in environment protection reaches CNY1.4 trillion i.e. 1.5% of GDP.

Developing countries like Pakistan has a great potential to develop projects based on Clean Development Mechanism (CDM) through reduction in greenhouse gas emissions, however despite huge monetary benefits this potential has not yet been exploited and the first commitment period under which CDM benefits could be achieved would end in 2012. According to one report, China already accounts for 60% of the carbon credits trading under the Clean Development Mechanism (Bezlova Nov. 11, 2009).

According to the Govt. of Pakistan (2005) the country though not a major contributor to global greenhouse gas emissions (carbon emission is about 0.4 per cent of global emissions) but have lot of trade potential for carbon emitter countries. A CDM cell had been established

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by the government in August 2005 but most of the modalities of the mechanism for projects and carbon market are still missing.

In case of industry, response to carbon trading varies significantly between sectors, within the same sector and between countries. The main factors that cause these differences include regulatory pressure, market differences and economic conditions, accessibility to alternative technologies etc. (Jeswani, Walter and Yacob 2008).

There is no specific legislation on Green House Gas (GHG) reduction for industries in Pakistan. Little information and knowledge is available about potential opportunities for GHG reduction in different sectors (Pakistan Forest Institute 2003). Pakistan is lagging behind in Clean Development Mechanism. There is absence of guidelines, policies or management at national level. Islamic financial industry has not yet positioned itself in this market.

Objectives of the Study

The objective of this research is to present a case of developing countries that have great potential for carbon trading to participate in controlling global carbon emissions. The study aims at considering the alternate choices and viability for Islamic financial industry. In this context it is:

- To describe the working of the emission trading market.
- To discuss the historic growth and future growth potential for the world's carbon markets.
- To find out the elements in the trading process in the market which are contrary to Shariah rules.
- To consider the viability of Islamic financial instruments to apply in the carbon market that can save this market from collapse. Further, the option for a separate market is to be considered.

Methodology

The paper is based on secondary data that covers different aspects of carbon trading including global policy issues, trends and prospects. The paper highlights information about the carbon trade, the conditionality of trade, problems and the threats. Opinion of the researchers has been incorporated while considering for the alternative options to run this trade. So, financial instruments being used by Islamic Financial Industry is to be considered as an alternate method to trade in carbon market. For this, viability of different instruments has been checked, and to avoid lengthy discussion only those methods are mentioned which have greater scope. For data analysis descriptive analytical method has been used.

An Overview of the Carbon Market

A) Working of the Carbon Market

The Kyoto Protocol (1997) is an international treaty that came in force in 2005. Developed countries agreed to reduce their emissions of the six major greenhouse gases. Emission

quotas or Assigned Amounts are supposed to be reduced by each participating Annex 1 country by 5.2% from 1990 level to the end of 2012.

It is also feasible for Annex 1 countries to start and sponsor carbon projects designed to reduce emissions in other areas. Through these projects marketable carbon credits are issued. These projects are handled under Clean Development Mechanism (CDM) and Joint Implementation of Kyoto Mechanism. This all is conducted under International Emission Trading (IET) where a nation emitting less than its quota can sell Assign Amount Units to a nation that emits more than its quota. The CDM covers projects in non-Annex I countries, while Joint Implementation covers projects in Annex I countries.

Pricing policy with respect to a specific pollution target is difficult. Govt. does not know in advance what price will achieve certain level of pollution, It is more appropriate to monitor quantity response to initially establish price and make adjustment until the proper level of pollution is achieved. Let the market establish the price. It is the main feature of Permit Trading System which works through Credit and Allowances. If the level of emission is set at 300 units then maximum of 300 permits with each of one unit permit is issued. Polluters are allowed to trade these permits; either to buy the unit of permit to get the Right to Pollute or abate whichever method is a cheaper option. Low cost abater will sell their permit and vice versa thus achieving the target level at an aggregate level. Under a Pollution Credit System a polluter earns credit if it emits below an establish standard. Under Pollution Allowances each permit gives the bearer right to pollute to a given extent. These two are marketable. While allocating allowances the overall quantity of emissions under the cap is divided between different polluters, then each of these polluters receives a permit for an allocated allowance of emissions which they are not allowed to exceed. These permits are distributed to the polluters for free or at a cost through auction (Callan and Thomas 1996).

Trading will continue till the Marginal Abatement Costs across firms are equal. In the absence of permit system then each firm has to abate all units of emission given to it. Trading system is more flexible because more permits can be issued according to the environmental requirement. It also eliminates bureaucratic interference.

The first auction was held by Chicago Board of Trade (CBOT) - the largest commodity exchange of the world for Sulphur dioxide (SO₂) to control acid rain in 1993 (Callan and Thomas 1996).

Stavins (November 2001) mentioned that more than 30 countries worldwide are engaged in carbon trading market. Emissions trading or cap and trade is a market-based method by providing economic incentives for achieving reductions in the emissions.

Central authorities say a government or an agency sets a limit or cap on the pollutant. The limit or cap is allocated or sold to firms in the form of emissions permits. Firms hold a number of permits or carbon credits equivalent to their emissions. These permits cannot exceed the cap. The purchaser is paying a charge for polluting, while the seller is getting reward for reduced emissions (Montgomery December 1972).

Carbon trading, sometimes called emissions trading, is a market-based tool where market trades emissions under cap-and-trade schemes or with credits to offset GHG reductions. The governing organization sets a cap and then distributes or auctions off Emission Allowances or bank them for future use, other firms which are in need, buy these credit. Cap-and trade scheme is mandatory and it can be voluntary. The cap is fixed, if the cap is set very high i.e. the base limit, excess emissions go in the environment thus making the scheme not very

effective. If cap is very high, the value of allowances would be reduced and the firms which have already reduced their emissions and have banked extra credits face losses. In case cap is set very low, it also affects prices of allowances by making them scarce and overpriced. In such a case some credits are kept in Safety Valves, so in case of any imbalances, additional credits are issued to stabilize the prices.

B) Historical Growth and Future Growth Trends

There are many arguments given in favor of carbon trading; it delivers a guaranteed level of emissions reductions and at low costs as well, encourages investment in low carbon technologies, and financing for mitigation in developing countries. However, the origin of trading is not old (Coase 1960; Crocker 1966 and Dales 1968). The history of emission trading prevails over four phases; one is the theoretical articulation of the instrument with flexible regulation, second, the developments of trading of emission certificates based on offset mechanism (under Clean Air Act 1977), third, launching of first Cap-and-Trade system (US. Acid Rain Program under Clean air Act 1990), and fourth is the emergence of global carbon market.

According to the World Bank, 374 million metric tones of carbon dioxide equivalent (tCO₂e) were exchanged through different projects in 2005, a 240% increase as compare to 2004. In other words, the size of the carbon market was 11 billion dollars in 2005 and 64 billion in 2007. According to Clifton (December 2009) there is a prediction of growth to a market value of US\$3.1 trillion per year by 2020.

The Kyoto Protocol is ratified by 163 countries. It sets emission reduction targets for developed countries to reduce at 5.2 percent below the levels of 1990 by 2012. There are different mechanisms known as 'Kyoto mechanisms' (Jeswani, Walter and Yacob 2008):

- (i) Clean Development Mechanisms
- (ii) Emission Trading
- (iii) Joint Implementation (JI)

Under Clean Development Mechanism, developed countries support the developing countries to meet their commitments for Green House Gases reduction. The European Union GHG Emission Trading Scheme (EU ETS) became effective from 2005. This scheme initially targeted utilities and big industrial emitters in the European Union. Jones et al. (2007) mentioned that the European Union Emission Trading Scheme (or EU ETS) is the largest multi-national, greenhouse gas emissions trading scheme, introduced in 2005 is the world's largest carbon market with more than 80 % of the world's total carbon credits.

The clean development mechanism (CDM) is a project-based method mentioned in the Kyoto Protocol to reduce greenhouse gas (GHG) emissions. Under CDM, developed countries get emission credits by investing in emission reduction projects in developing countries. The CDM is very beneficial and attractive for developing countries. UNFCCC (2008) highlighted the fact that it has taken over US\$25 billion for funding projects in a short time. In 2007, the CDM accounted for 91% of the value in the world carbon market, with primary transactions worth \$7.4 billion (Capoor and Ambrosi 2008). Over 149 million emission credits had been issued by May 2008 (Ganapati and Liu 2008). The Clean Development Mechanism (CDM) allows developed countries with binding targets to buy credits from developing countries

which do not have emissions reduction targets. For each tonne of CO₂ abated through CDM project, the developing country is awarded a certificate called Certified Emissions Reduction (CER). Companies purchase these CERs to meet their obligations.

Joint Implementation is also a scheme for the offsetting of emissions reduction obligations. The offsetting projects are now between developed countries. The countries with a binding cap can purchase credits from JI projects to reduce emissions in other countries with a binding cap. JI scheme is so far limited as compare to CDM.

Baumert et al.(2005) and UNDP (2005) mentioned that the UK and Pakistan present two examples. These two countries are different in economic development, GHG emission levels and climate policies. Pakistan's per capita GHG emissions are one-seventh of the UK's and the GDP per capita of the UK is 13 times higher than of Pakistan.

Kumar, Wehrmeyer and Mulugetta (2007) expressed that Pakistan ratified United Nations Framework Convention on Climate Change in 1994 but so far no sizable effort has been done towards climate activities. There is no legislative effort for GHG reduction for industries in Pakistan. Pakistan can take benefit through Clean Development Mechanism.

Aslam (2001a) and Ministry of Environment (2006) found that there is lack of knowledge, institutional support and weak understanding of Kyoto Protocol framework in Pakistan. Potential opportunities are always wasted. Further, environmental policies are unable to meet the targets set in the environmental plans (Nazir 2002).

There are other transferable instruments, for example Renewable Energy Certificates (Green Tags) that are used for renewable energy within some American states. Energy provider issues energy tags say one tag for 1000 kWh of energy. These tags are purchased by the firms and individuals to identify the volume of energy that is coming from renewable sources. The energy provider sells these tags for profit in the open market. Their issuance is unregulated, however it shows corporate responsibility.

C) Carbon Leakages and Its Effects

Same regulations for emissions don't prevail equally in all sectors or countries. Barker et al. (2007) discussed that there is an effect of regulation in one country or sector on the emission of other country or sector with no regulation of the same kind. This effect is called Carbon Leakage. The effect and extent of this carbon leakage should be how much, is not decided yet. However, Barker et al. (2007) examined the literature on leakage and elaborated that the leakage rate is defined as the increase in CO₂ emissions outside the countries taking domestic mitigation measures, divided by the reduction in emissions of countries taking domestic mitigation action. As a result if leakage rate is greater than 100% that means the domestic measures to control emissions have the effect of increasing emissions in other countries to a greater extent, i.e., domestic mitigation action had actually led to an increase in global emissions. Offsetting projects frequently do not reduce emissions rather sometimes result in the opposite.

D) Comparison of Cap-and-Trade with Other Methods of Emission Reduction

There are some other methods and choices to control emissions. These other methods, rival methods to carbon trading include "Command and Control" policies and incentive based system. People around the world are favoring Carbon Trading instead of carbon tax, for nobody likes taxes. Carbon

tax, Cap-and-trade, and offsets created through a baseline and credit approach all are market-based measures that put a price on greenhouse gases. In a baseline and credit program polluters that are not under an aggregate cap can create credits, usually called offsets, by reducing their emissions below a baseline level of emissions (Chomitz 1999). The cost of the measure taken differs because Marginal Abatement Costs (the costs of eliminating the additional unit of pollution) varies from country to country. Emission trading is based on this difference of MACs.

An emission tax is contrary to this because it is a price that is fixed first and then emissions are allowed to vary according to the production activity. Voters always dislike taxes. According to World Bank (2010) Denmark is using carbon tax as a pricing system.

There is another method called Safety Valve which is the combination of both price and quantity. It is based on permit trading system but the level of price (lowest or highest) for the permit is capped.

According to World Bank (2010) there are considerations in U.S.A. Congress to impose a carbon surcharge on imported goods from those countries which have no cap and trade system.

Elements in Emission Trading Contrary to Shariah Rules

Following are the key aspects which have been found in carbon trading that makes it unfit for an Islamic trading system and a business deal to be legitimate.

- An emission trading system (cap-and trade) is a quantity instrument because it fixes the quantity of emission level and then allows the price to vary. This price depends on market condition and any uncertainty in future supply and demand creates an uncertainty in the future price of pollution credits, thus burden would fall on the industry not on the organization/government that alters the caps set in through unfairness thus leading to corruption.
- The London Financial market place is working as a center of Carbon Financial Market, shows the type and category of financial players in the market. Also CDM projects are criticized for favoring socially unjust projects.
- As Leonard (2009) found the Cap and Trade system gives unjust financial gains to major polluters resulting from free permits, and cheating in connection with carbon offsets.
- Regulatory agencies issues too many emission credits thus reducing the price very low that gives huge losses to those who emit less and gives great advantage to those who pollute the environment more.
- Emission Trading lacks proper accounting standards and an organized platform. So lack of organized market leads to doubt about its legitimate viability.
- Credits are traded on the bases of projections which are manipulated by participants.
- It has been observed that the majority of the trade takes place through banks and investors by speculating in the carbon market by offering carbon credits through complex financial procedures and products similar to Sub-Prime Mortgages, therefore creating a fear of crash of Emission Trading Market. These instruments are interest based instruments.

- Carbon trading is buying and selling of an artificial commodity- The Right to Emit Carbon Dioxide.
- There is frequent use of complex financial instruments known as derivatives. The immediate buying and selling of carbon allowances and credits between companies and in return for cash is known as 'spot trading'. There are other types of more complex transactions, including futures, forward and options contracts. These all are derivatives whose value is derived from the value of another, underlying asset (Raghunathan and Rajib 2007), for to reduce the risks associated with to purchase carbon permits.
- Emitters can produce more emissions than their permits by purchasing offset credits thus desrtroying the nature ruthlessly.
- There are also other problems associated with projects based on off-setting, for example social and environmental problems like displacement of communities.
- Most of the carbon permits and credits are held by people and organizations like large financial institutions, investment funds and brokers who hold these just for making money through speculation in buying and selling. Clifton (2009) mentioned windfall gains between €23 billion and €63 billion during Phase II of Kyoto Protocol.
- Price is the main factor for emissions reductions under a trading scheme, a collapse in the price of permits then creates disincentives; firms can buy and use them without making any effort to reduce their emissions.
- The trading is not asset based. It works under an Artificial Commodity.

Viability of Islamic Financial Instruments And Proposal for a Separate Trading Market

Critics have mentioned that Emission trading is much like the subprime mortgage crisis, which if worsen could be disastrous not only for the environment but also for the economy as well.

The Kyoto Protocol has set no upper limits for their obligation for emission reductions that Annex 1 countries can offset, so it is up to that country to decide how much of their emissions cuts are shifted to offsetting. Many countries have taken a large proportion for off-setting. Off- setting actually transfers responsibility from developed countries to developing countries thus no surety for emission reduction globally. There is also a Hot Spot problem. It means that where the pollutant is actually released, for, the same quantity of a pollutant can have a high impact on some locations and a low impact on other locations. Another problem is as described by IMF (2008) that Polluting firms are usually given emission permits for free (grandfathering) so they go for less cut or no cut in emissions fearing that they will not get permits in future (in case they cut large cut today), but (Hepburn 2006) suggested that permits should be auctioned to polluters, rather than giving them for free. Keeping in mind the problems and non-Shariah compliant nature of the Emission trading system, there is a need to restructure the system in a way that suits Muslims 'economies. Since the present trading system is very complex so it is quite difficult to develop an alternate system which would be free from all ills. However, the first step is actually an initiative then we need a big push to develop the new system.

Islamic finance industry is growing at an estimated rate of 10%- 20% annually and the assets reached to about \$1 trillion. More than 250 Islamic banks are operating worldwide in over 75

countries (Yeter 2010). There is a great scope for Islamic banks to invest in carbon trading but under the separate trading system.

An example is given by developing a model:

A Sample Model

Polluter X and Y both emit 100,000 tons of CO₂ every year. They both are given emission allowances for their total or less than total emission by the government. Let's assume that allowances are equal to their total emission i.e. 100,000. Each allowance stands for 1 ton of emission reduction. Polluter X can reduce its emissions at a cost of \$5 per ton, and Polluter Y reduces it at \$15 per tons, whereas the market price of allowance is \$10.

The total reduction costs for X are:

$$100,000 \times 5 = \$ 500,000$$

The total reduction costs for Y are:

$$100,000 \times 15 = \$ 1500,000$$

In this case Polluter Y will not reduce it on its own rather would go for the market price or would opt for buying from X if any extra allowance is available. At market price the costs for Y are:

$100,000 \times 10 = 1000,000$ So the savings are $1500,000 - 1000,000 = \$500,000$ but still reducing emission at market price is expensive for Y as compare to the reduction costs of X i.e. \$5 per ton.

Let's assume the govt. gives them the target of 90,000 allowances; per allowance per ton. Then trade takes place by buying 10,000 units from X by Y because reducing 90,000 at \$15 means \$ 1350,000 are still higher than 900,000 of X at market price ($90,000 \times \$10$) or 450,000 of X at home costs ($90,000 \times \$5$). So X will reduce emission at home costs and sells extra to Y at market price.

$$90,000 \times \$5 = 450,000$$

Remaining \$ 450,000 ($900,000 - 450,000$) worth of allowances are still available for sale. Y would prefer to buy it rather than spending \$1350000.

Up to this, trading is simple. The real problem starts when players enter in this market, start speculation, tempers the price, and use interest based financial instruments.

There is another case in which one country has already emission level less than the allowed limit. For example, there are two countries A and B. A has a high emission and B has lower emission than the allowed limit. Suppose country A has the obligation to reduce and cut CO₂ level from 15% to 25%. This reduction is equal to say 500 m tons of CO₂. Country A will issue allowances worth of this quantity say one unit of allowance equal to one ton of CO₂. Country B with less emission has credits equal to the level of reduced limit of emission so it has credits, now according to the present system country B will sell credit to country A but

according to Islamic principles this selling should not take place because no one is allowed to destroy the nature and exploit the resources more than its need. Secondly since the allowances are not always equal to credit of a single country. Credits are being purchased by the polluter countries which they utilize against their emission, surplus allowances are banked for future use this is also not allowed because it leads to manipulate the market. Islamic countries should not trade under the present prevailing system. In order to stop this practice under Islamic Trading System first the legislation is to be prepared to avoid all these practices. They should not be allowed for off-setting because in this case there would be no overall reduction in emission rather global emission is increased. One side of the trade i.e. selling credits should be stopped. Only allowances could be issued which are to be converted into CDM projects. Then the value of these projects would be offered in Sukuk bonds. The success of the CDM project would have positive impact on the demand and price of bonds. Ilias (2010) mentioned that the global market for Islamic bonds is estimated to be \$110 billion. Malaysia is having the world's biggest sukuk market with 40% contribution in global sukuk. Other markets are UAE, Saudi Arab and Bahrain. So there is a great scope for Islamic bonds.

Takaful is to cover the risks of the CDM projects. Equity Financing instruments; Modarabah and Musharika are also easily applicable. Musharika can be practiced between countries and among companies for different emission reduction projects. Murabah is also very feasible. Ijarah has a great scope for recycling equipment, filter plants and machinery. GHS should be treated as a target not as a commodity. Under the present system permits are given free but then sold by the company with high price, is also not fair. The present system is not asset based and loss is shifted to the other part of the world that damages the environment elsewhere. Consulting agencies established under shariah principles have wide scope for this market. No price tempering would be allowed and there is no need for derivative market. Derivatives are also risky because their value depends on the value of some underlying asset or just underlying. Similarly financial futures are contracts and obligations that help to lock-in the price at which one wishes to buy or sell an asset in the future to protect against the price changes. There is no need to rely on these instruments. For the determination of price, pre fixation of the price and the quantity is not correct rather Safety Valve is better and is suggested because it is a combination of both price and quantity.

Countries like Pakistan, Malaysia, Bahrain, UAE. Iran, Qatar and many other countries with low emission and a flourishing Islamic financial industry has a great scope.

Conclusion

There is no doubt that environmental degradation has reached at its heights and emission is still increasing at an alarming rate. Koyoto Protocol has set limits for countries with high emissions and obliged them to reduce within a given time frame. The world has succeeded in developing a mechanism to overcome this problem but unfortunately this system which is called Emission Trading system is formulated and designed by those countries which have very high level of Green House Gas (GHG) emissions. The mechanics of this system seems to be very attractive and fruitful but in reality the emission is being off-set with those countries that have emission less than the allowed limit thus having no positive effects on the global environment. Add to this many players have entered in this market, tempering with the prices of credit and allowances, manipulating with the limits of caps set for emissions, speculating with the market instruments, banking the surplus credits, using the derivatives to earn huge profits thus leading to the results similar to subprime mortgage crisis as a result of which in this case not only the economy but the environment will also collapse. This is in fact

the “Beginning of the End”. It is a high time to save this market by developing alternate options to run this trade; Islamic financial instruments like Sukuk bonds for CDM projects, Ijara for project equipment, Takaful for risk sharing for all JI and CDM projects, Musharika among companies to start joint projects could be effectively used. The trade should be asset based and the role of the Artificial Commodity should be eliminated. So far no country or institutions has applied Shariah compliant instruments. There is a need for an initiative and there would be a billion dollar market. That would be decided later about the currency in which the denomination of the instruments is made and designed.

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