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CHAPTER V : CONCLUSION AND RECOMMENDATIONS

5.1 Summary and Conclusion

As the concern for changing climate and its impact on business had started to get more attention, businesses noticed the importance of ‘environment’ as a source of risk. It started with examining the corporate sensitivity to weather or climate effects, and from this begun the exploration of the possibility of using financial markets to manage these risks. Since 1997, there has been an expanding weather derivatives market worldwide, and it has involved a diverse interested parties concerned about the impacts of everyday weather on their operations or sales. Weather derivative not only addresses the corporate response to the threat of weather risk, but has also been successful to convert it to an opportunity for financial gain. This dissertation primarily highlights the importance of undertaking research on weather derivatives and its ability to mitigate the risk, and the same is done through a case study on DVC. It looks at the opportunities and the challenges that will be thrown open as this newer form of risk management is adopted. This final chapter summarizes the important findings and major takeaways from the study.

Chapter I has introduced the concept of weather risk as one of the major systematic and non-operational source of risk. It has distinguished weather risk from other types of environment related risk like climate or catastrophic risk, and briefly discussed its relation with energy sector. It has also indicated the need for evaluating the efficiency of weather derivatives in Indian context. After a survey of literature, the research gap has been identified based on which objectives of the study have been defined. Then the methodology is elaborated, and finally the chapter plan has been laid down.

Chapter II has explored the nature of weather risk and its presence in different sectors in detail. It has also critically evaluated different weather risk mitigation instruments, specially weather derivatives and their application in Indian context. Weather affects business from both direct and indirect ways. It affects directly the volume of sales (for example soft-drink industry) or the volume of raw materials used in the business process (such as coal used in thermal power production). The indirect effect normally comes through price. Weather affects the price of a product or price of raw materials used in production process. Weather risk or the risk originating
from the regular weather fluctuation is different from catastrophic and climate risk. It can be defined as the financial exposure of a company’s earnings and cash flows attributable to fluctuation in regular weather events such as temperature, humidity, rainfall, snowfall, stream flow, wind etc. The unique characteristics of weather risk are that it is volumetric, localized and a non core risk for almost all businesses. Weather is completely beyond human control and cannot be traded as a physical commodity like other commodities. The nature of weather risk exposure of different industries like agriculture, food and beverage, dairy, retail, manufacturing, tourism and hospitality, construction, entertainment, transportation, natural gas, bank and insurance, government and non-profit organization are different in nature and each should be dealt differently. As power is the central focus of study, the nature of sensitivity that power sector has towards different weather variables have been analysed in detail in this chapter. All three major functions of power sector namely, generation, transmission and distribution are affected by varying weather conditions. The literature highlights a nonlinear temperature-electricity relationship depicting a ‘U’ shaped temperature electricity curve (TEC), which means that there is higher demand for power at lower and higher temperature for heating and cooling purpose respectively. The electricity generation, on the other hand, also depends on relevant weather conditions, like hydroelectricity depends on the amount of rainfall received at relevant river basin or reservoir, whereas the wind power generation depends on the wind speed.

Chapter II has also evaluated different methods of risk mitigation strategies and instruments that have been in use for mitigating weather risk. The traditional strategy involves diversification, contract contingencies and traditional insurance, where as more recent strategies involve commodity derivatives, weather insurance and weather derivatives. CAT bond and CAT linked derivatives are normally used as mitigation instruments for catastrophic risk. Weather derivatives are most popular among all such mitigation practices. A weather derivative contract is defined by a contract period, a measuring station, a weather variable, an index, a pay-off function and a premium amount payable. There are two degree day indices which are in common use - Heating Degree Day (HDD) which is normally used in winter and is correlated to the electricity demand for heating, and Cooling Degree Day (CDD) which is normally used in summer and is correlated to the electricity demand for cooling. The other indices used are Energy Degree Days (EDDs), Growing Degree Days (GDDs), Average of Average Temperature Indices, Cumulative Average
Temperature (CAT) Indices, Event Indices. In rainfall, common indices are Cumulative Rainfall Index, Rainfall Deficit Index.

Weather derivatives are either traded in Exchanges or in Over-The-Counter (OTC) markets. The Chicago Mercantile Exchange (CME) in USA is the pioneer and most prominent exchange trading weather derivatives. On the other hand, there exists an OTC market which, in terms of volume, is far larger than exchange traded market. The main CME traded contracts are CDD/HDD Future, Option on HDD/CDD Future, Monthly, Seasonal and Seasonal Strip Spread. In non-temperature segment, CME trades on Frost Day Future, CME Snowfall Futures and Options on Futures. The OTC structure includes mainly Swap and Option.

The existence of high basis risk in terms of weather and the trade-off between basis and credit risk is one of the major issues that are faced by weather market, which may prove to be restrictive for its development. However, the most important unresolved issue in weather market today is lack of a universally accepted pricing mechanism which is responsible for its high bid-ask spread. Few pricing models have been explored in this chapter for use in the empirical part of the study.

Chapter III has explored the development of and current scenario in weather derivative market worldwide. Weather derivative trade was started in USA, and then spread in Europe, predominantly in UK. Later, it expanded to other Asian countries, mainly in Japan. Deregulation of energy markets in the U.S. was the primary catalyst in shaping the global weather risk market. Another key factor was the convergence of insurance and capital market in US. Enron Corporation also played a crucial role in early market development. But, the weather market in Europe grew in a different way as compared to USA which was largely driven by banks and less by insurance and energy companies. Again, in most developing countries weather instrument has primarily taken the form of index based weather insurance. The rainfall insurance in India is a classic example of weather insurance policy.

World’s first exchange traded weather contract has also started in US in September 1999 by Chicago Mercantile Exchange (CME), which is still the most prominent exchange in weather trading market. The OTC market only contributes marginally and mainly concentrates in Europe.
and other countries, where as traditional weather market in US is primarily exchange based. More than 95% of the contracts traded in CME are CDD/HDD based, where as rainfall and other temperature based contracts are normally traded in OTC market. Energy initially was the major player in the market, but over the time period the share of energy sector has gone down in weather market while the participation of construction, entertainment and other sectors have increased.

Based on the understanding developed in the previous chapters, chapter IV has empirically developed two weather derivative instruments to mitigate two major weather related risks that Damoar Valley Corporation (DVC) faces and tested the efficiency of the same. One suitable rainfall derivative has been developed to mitigate the hydro electricity generation risk, and one temperature derivative has been developed to mitigate power demand in this part of the study. For the purpose, 80 years of monthly rainfall data of four districts – Hazaribagh, Giridih, Bokaro and Dhanbad, 40 years of daily temperature data of Kolkata city, hydroelectricity production data of Panchet and Maithon for 12 years, and power demand data of West Bengal for two years have been considered. The major findings from the empirical part are as follows.

- It has been found that the temperature data of Kolkata city is having significant trend during summer season, but not for winter season. The rainfall in Barakar- Damodar basin is free of trend over its sample period.
- For rainfall risk, DVC can use a put option on a suitable rainfall index for mitigation purpose, as the nature of risk arises due to insufficient rainfall in the basin.
- There exists a linear and proportional relationship between the rainfall in the Damodar- Barakar basin and hydroelectricity generated in power plants of DVC. In case of Maithon and Panchet plants, the yearly generation depends on the amount of rainfall the river basin receives during Monsoon which explains more than 85% (adjusted R square is found to be 85.88%) of the variation in production. Hence monsoon rain is the most significant source of weather risk for both the plants.
- The coefficient of the explanatory variable has shown the sensitivity of power generation towards rainfall i.e. one mm less rainfall in Damodar-Barakar Basin leads to an estimated 64.87 MWH less generation in the DVC.
• As the monsoon rainfall in Damodar-Barakar basin could explain more than 85% of the variation in generation, the same has been used as an effective underlying index for the put option.

• Tick rate has been calculated as the average of the result from margin coefficient method and regression method and decided at Rs. 50,000.

• The strike has been considered at a level of 25% of the standard deviation less than the long term average and settled at 4415 mm. The study has settled a limit at 3325 mm, which is 150% of standard deviation below the long term expected value of the index. The money value has been calculated as Rs. 550,00,000.

• A suitable put option on rainfall has been thus defined as (in terms of Rs. '00,000) –

\[
P(x) = \begin{cases} 
550 & \text{if } x \leq 3325 \\
0.5(4415 - x) & 3325 < x < 4415 \\
0 & x \geq 4415 
\end{cases}
\]

• More than one pricing methods have been used for pricing the option. The burn analysis conducted to determine the value of the premium has yielded a yearly premium of approximately Rs. 108 lakh where as a simulation based on empirical probability distribution has given an approximate value of Rs. 110 lakh.

• Gamma has been found to be the most suitable distribution for rainfall and using Gamma distribution, index modelling has been done which has given an approximate premium value of Rs. 114 lakh. A study of 200 simulated series has shown the value of Rs. 115 lakh, which is not significantly different from the value derived from index modelling. All four methods of pricing have given a consistent result, hence the models used are justified.

• The use of a rainfall put option has significantly reduced the variance of the profitability of DVC, but has not negatively affected its average profitability. The contract has successfully hedged the rainfall risk of the firm, and hence with the use of the contract DVC can move to a better position in the efficient frontier. The Pitman Morgan test to judge effectiveness of rainfall derivative has given t-statistic value 8.3766 with p value
less than 0.00001. The null has thus been rejected at 95% confidence interval. For paired t test for equality of mean, the t statistic is calculated as 0.113 (one tail p-value -0.455) and the study has failed to reject the null.

- The regression analysis conducted as a part of the study has revealed that power demand depends on surface temperature, holiday and festive days (all found statistically significant). Average daily temperature enters the model in a quadratic form, where as the other variables enter in a linear form. It has also been shown that power demand also depends on CDD, holidays and festive days. This model has been considered to be more relevant as the underlying of temperature derivative in almost all markets is primarily CDD.

- A simple CDD put option contract of seasonal type with the stretch of seven months from April to October has been used for DVC to hedge its temperature risk. The risk is downside in nature as lower summer temperature leads to lower power demand in eastern region of India.

- The tick value has been found through estimating the sensitivity of power demand to CDD change using regression approach. It has been estimated at approximately Rs. 50,000, which simply implies that the firm should look for a hedging strategy where a CDD fall would compensate them to the extent of Rs. 50,000.

- The strike has been settled at 2620 CDD and the cap at 2530 CDD. The limit in terms of money value has been settled at Rs. 45,00,000.

- A suitable put option on temperature is thus defined as (in terms of Rs. ’00,000) –

\[
P(x) = \begin{cases} 
45 & \text{if } x \leq 2530 \\
0.5(2620 - x); & 2530 < x < 2620 \\
0 & x \geq 2620 
\end{cases}
\]

- Under burn analysis, the premium has been calculated for the stated option as Rs. 10,45,903. Under index modelling, the probability distribution of the April-October accumulated CDD-index has been found to be Normal. The premium has been calculated as approximately Rs. 9,64,000.
Among many daily temperature models available, the study has adopted a popular model for weather derivative valuation primarily suggested by Campbell and Diebold (2002, 2005) based on an autoregressive (AR) process and a lower ordered Fourier series in both mean and variance dynamics. After the conditional mean and variance have been forecasted through the model, the study has used the simulation technique for the valuation. The valuation of the option thus found is Rs. 10,14,800, which is quite consistent with the option payoff calculated from the other two methods. A comparison of the three different pricing methodologies used has reflected that the Burn analysis has marginally over estimated the premium as compared to the other two.

The Pitman Morgan test for equality of variance has given t statistic value of 6.24 with p-value less than 0.001, and hence has rejected the null at 95% confidence interval. This indicates that the inclusion of option has significantly reduced the risk of the firm. In case of paired t test for equality of mean, the t-statistic has been calculated as 0.21 (one tail p value .37). Hence the study has failed to reject the null and has brought out a finding similar to that of rainfall derivative.

The study concludes that it is possible and profitable for a power firm to mitigate its weather related risk from both generation and distribution sides through weather derivatives. It can also be concluded that though rainfall insurance is available in India, weather derivatives can cater the need at a broader level and in a more generalised form.

The conditions for weather derivatives to be successful may not be equally present in all countries, but as far as the Indian economy is concerned, it appears to be substantially large. India also has a very large underground market for weather i.e. there exists an illegal weather betting market in India. As published in one of the leading newspapers, the bookies in the weather market in India have accepted bets worth Rs. 3000 crore in the year 2007. The main centre of this illegal trading is Mumbai city and the primary underlying variable is monsoon rainfall. Betting takes place on the date of arrival, maximum daily rainfall and cumulative rainfall over a time period. This figure is a substantial proof to determine the size of the speculation that will ensure liquidity in the weather derivative market, if developed in India.
Although it is technically feasible to introduce weather derivative, India is yet to fit for the same and the obstacles come primarily from regulatory aspects. Hence, one of the primary steps to be taken is the removal of these obstacles including enhancing the power of regulatory authority. Accordingly, the next sections briefly discuss the readiness of India from regulatory perspective for introducing weather derivatives product.

### 5.2 Present Regulatory Obstacles for Weather Derivative Trading

The commodity futures market in India is more than 100 years old. The first organized futures market, 'Bombay Cotton Trade Association', was established in 1875 to trade in cotton contracts. This was just 10 years after the establishment of Chicago Board of Trade (CBOT) in USA, which is now known as Chicago Mercantile Exchange (CME), and thus Bombay Cotton Trade Association became the 2nd oldest commodity exchange in the world. Subsequently, many similar markets were formed including Gujarat Vyapar Mandali for oilseeds (started in 1900), East India Jute Association Ltd. (began in 1927) for raw jute etc. By 1930s, there were more than 300 commodity exchanges in the country dealing in commodities like turmeric, sugar, gur, pepper, cotton, oilseeds etc. The futures market in India experienced rapid growth between the period of First and Second World Wars. Trading was conducted through both options and futures instruments, but there was no market regulator then and hence there was no uniformity in trading practices. Further, there was no structured clearing and settlement system. However, during the World War II, British government banned forward trading in most of the major commodities in India primarily with the objective to control inflation.

After independence, the Forward Contracts (Regulation) Act, 1952 (FCR Act, 1952) was passed to regulate this market. Forward Markets Commission (FMC) was subsequently set up in 1953 to control the future trading in India. Although 64 years old, and an amendment is long pending, this Act governed futures trading in commodities in India till recently.

The main features of the FCRA that need immediate attention are as follows:-

(i) The Act applies to all goods, and "goods" are defined in the Act as movable property, other than security and currency. This definition of ‘goods’ actually prohibits the trading
of weather derivatives in India, and redefinition of ‘goods’ is required to introduce weather trading.

(ii) Section 19 of the Act prohibited options in goods. This section either needs to be removed or amended before introducing option trading in commodity market, which is also necessary for weather trading.

(iii) Contracts have been classified as essentially of two types: ready delivery and forward delivery. Ready delivery is those contracts where physical delivery is done within a specified time period. All other contracts are called forward contracts.

(iv) The Act envisages a three tiered regulatory framework. Firstly the exchange itself formulates its own rules, articles of association and bye-laws. The exchange regulates trading on a day to day basis. Second, the Forward Markets Commission (FMC) approves these rules and bye-laws and provides regulatory oversight. Third, the central government, through the Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution, is the ultimate regulatory authority. Until 2008, when the government delegated most of its powers to the FMC, it retained full control over the commission. In fact, the FCRA envisaged the FMC as having a recommendatory role.

(v) The Act lays down penalties for illegal trading. However, over the years, it has been noticed that these are too nominal to have any deterrent effect. Also, there is no provision to relate the penalty to the amount involved in the offence.

5.2.1 Steps Towards Regulatory Reforms

The FCRA, 1952, has been at the centre of many debates, and many authors have brought out problems in the Act. The major problem is that there is a need for a strong regulatory body to guide the market. The existing FMC has not been able to meet the emerging needs of the fast-growing commodity markets in India. FMC was primarily set up as an advisory body under the Department of Consumer Affairs, which retained most of the regulatory authority. As against this, in comparison to the regulatory capacity of the FMC, the Indian capital market regulator - SEBI is a statutory body- set up by the SEBI Act, 1992. FMC can also be contrasted with the Commodity Futures Trading Commission (CFTC), the regulatory authority in the USA.
Established in 1974, it has been highly successful because of the wide powers and the authority given to it, unlike FMC.

In mid-1960s, government imposed a ban on the futures trading of most of the commodities on the assumption that it fuels inflationary conditions, and so no need was felt to amend the Act. By the end of 20th century, India emerged as a prominent market for agricultural trading and Indian farmers wanted a platform for better price discovery and risk management for ago-marketing. This prompted the government ultimately to lift the ban on forward trading in April, 2003, and 3 national electronic commodity exchanges came into operation in the same year as a result. There are now 22 recognised commodity exchanges in the country including 6 National Multi-Commodity Exchanges, and more than 40 commodities are actively traded in these professionally managed commodity exchanges (Source: Website of MCX, www.mcxindia.com).

Finally, a bill to amend Forward Contracts (Regulation) Act, 1952 with the aim of creating transparency in commodity trading and giving more authority to FMC was introduced in Rajya Sabha in 1998, and the same was referred to the Standing Committee on Food, Civil Supplies and Public Distribution for examination and report. The bill, after incorporating the recommendations of the Standing Committee, was passed by Rajya Sabha in 2003, but could not be passed by Lok Sabha due to its dissolution. The Bill was again presented at Lok Sabha in 2006 and the same was again referred to the Parliamentary Standing Committee for its observation. The Bill was, however, withdrawn due to issuance of the Forward Contracts (Regulation) Ordinance, and the Ministry of Law (Legislative Department) advised that the Bill of 2008 needs to be consequentially amended before being considered for passing in Lok Sabha. Accordingly, a Cabinet Note for moving official amendments was sent to Cabinet which approved the proposal with the direction that a final decision regarding the definition of "commodity derivative" be taken by the Minister of Agriculture, Consumer Affairs, Food and Public Distribution and the Minister of Finance. However, the said Bill also lapsed upon the dissolution of the Fourteenth Lok Sabha. The Forward Contracts (Regulation) Amendment Bill, 2010 was introduced in December, 2010 and again sent to a committee for examination and report. The Bill was cleared by the cabinet and was supposed to be presented in Parliament, however it got delayed due to the objections raised by a few coalition partners and ultimately lapsed for the fourth time with the dissolution of fifteenth Lok Sabha.
5.3 Policy Implications

In September 2015 FMC ultimately got merged with SEBI (Securities Exchange Board of India), and thus begun a new era for commodity trading in India. The merger of SEBI and FMC was first suggested in 2003. In 2007, the committee headed by Percy Mistry, a former World Banker, submitted a report suggesting to bring regulation of all securities trading across stocks, bonds, forex and commodities under SEBI. This view was also endorsed by a committee on financial sector reforms headed by Raghuram Rajan in 2009 and the Financial Sector Legislative Reforms Commission (FSLRC) in 2013.

SEBI is currently developing a makeover plan for commodity trading exchanges in India. As a part of the plan, SEBI has already formulated a Commodity Derivative Advisory Committee. In a recent circular (September, 2016) SEBI has allowed option trading in commodity market for the first time. The prospective regulatory development that is most relevant for this research work is that SEBI is also planning to allow trading in weather derivatives. The idea was first mentioned during the presentation of Union Budget of 2016 and has already been discussed in the first meeting of the Commodity Derivatives Market Advisory Committee in the first week of March, 2016. Representatives from SEBI, commodity exchange officials and of the Agricultural and Processed Food Products Export Development Authority were present during the meeting. SEBI has set up a panel to analyse pricing models on such derivatives and the infrastructure needed for its implementation. This work has discussed the basics of such an instrument and its probable pricing structure. This may serve as a good starting point and useful direction for the analysis of weather derivative product that SEBI is currently contemplating to introduce in Indian capital market.

5.3.1 Required Regulatory Initiatives for Weather Derivative

As for any other derivatives, there is a need for a regulatory framework for the introduction of weather derivatives trading in India. However, the aim should be to form broad, overall regulations. If the regulatory framework is too prescriptive and narrow, it could curb the development of the weather derivative market.
Issues which arise with respect to weather derivative are:

(i) Developed markets abroad have vibrant exchange traded markets as well as OTC markets in parallel. The former caters for players who prefer standardized products with counterparty risk being taken care of, while the latter cater for those who are content with a higher counter party risk, but who prefer customized hedging solutions. Weather derivatives regulation in India must cater for both these markets in parallel.

(ii) Easy and ready availability of economically accessible weather data would play a key role in the growth of the weather derivatives market in general. Again, the degree of accuracy of weather data is crucial in identifying and managing weather risks. Weather data collection and the security of the process of data collection need to come under some legal ambit and would call for regulatory directives in India. Also in the same ambit, should be the quality control of the weather recording equipment and of the data collected.

(iii) Weather forecast plays an important role in weather derivative market. A system of integrating weather forecasts into trading of weather derivatives would have to be developed. This would require an up-gradation of the accuracy of weather forecasts in India. The 'fair value' price of a weather derivative option would vary depending on the seasonal forecast, which would be of importance to hedgers seeking to hedge weather risk.

(iv) It is equally important to frame a proper regulatory system for dissemination, on a real-time basis, of weather forecasts to all players in the weather derivative market on an equal basis.

(v) Practices in most countries do not permit employees of observing weather stations to trade in weather contracts. Those involved in issuing weather forecasts would also need to be barred from trading in weather contracts in India.

(vi) FII investments in weather derivatives have both advantages and disadvantages. The major advantage would be an increase in the depth of the market.

(vii) The necessity of conducting research and generating awareness for weather derivatives needs to be built into the Indian regulatory framework of weather derivatives.
(viii) To be able to benefit from the experiences of the Indian commodity derivatives exchanges in the last 3 years, it would be prudent that a new derivative, like weather derivative, should be introduced in existing exchanges and not in a separate exchange. It would be crucial to have an appropriate regulatory and legal environment for weather derivatives so that this aspect of the derivatives exchange can develop in a healthy manner. If not, this could lead to friction between market sectors (banking, derivatives, securities) over the prerogative of regulation. An inappropriate regulatory and legal environment could also lead to scandals, corruption, uncertainty about equality in the application of regulations, and market failure.

(ix) Policies and regulations need to be in place with respect to trading in weather derivatives in foreign derivative exchanges. By allowing trading in these products between local and foreign exchanges, it would help in increasing liquidity by providing arbitrage opportunities. More importantly, this would also allow better portfolio management through transfer of risk between countries.

5.4 Limitations of the Study

However, there are some challenges and issues in launching a weather derivative market in India. While in developed countries people have realised that they can no longer blame low profits on the weather, this realisation has not come in developing countries. Lack of awareness of the possible benefits of such instrument itself may negatively influence the willingness to opt for them. Lack of availability of reliable weather data, lack of product knowledge and other regulatory issues as discussed in the preceding sections, stand in the way of development of weather derivative market in India. Moreover, weather needs to be included in the list of commodity for introducing weather trade. But despite these limitations, weather derivatives have the potential to emerge as an attractive, low cost flexible tool, and are expected to gain attention of the risk managers in India.

In spite of its significance, the present study, however, suffers from the following limitations.

- The major constraint that the study faces is the non-availability of weather data which leads to mismatch in the periodicity. In fact, lack of availability of clean continuous and
cheap, if not free, weather data is the biggest constraint that the weather derivative market in India may face.

- Non-uniformity of the study period is again a result of data constraint. As rainfall derivative uses monthly data, 80 years of data are considered in developing its derivative; whereas as only 40 years of daily data are used for temperature study.

### 5.5 Scope for Further Research

The research on weather risk and its mitigation strategies in India is in nascent stage, and there lies a huge scope for further research. The present study could only address the basics of such risk management practices. Hence the possible areas for further research are –

- The present research study only focuses on the technical feasibility and financial viability of including weather derivatives as financial instrument in Indian capital market. It has however not captured the perceptions and readiness of hedgers and investors in India to accept the product. It is important to understand the perception of market for successful implementation of any financial instrument. Hence, there is a huge scope for research in understanding market sentiment towards weather derivatives in India.

- As brought out in the introduction to this dissertation, a large number of businesses would have their revenues affected by weather, and weather derivatives would be a source of hedging for them. There are other industries, besides power, practising weather risk management on a regular basis in international front. Hence, a similar study can be done on other relevant industries to adjudge effectiveness of weather derivatives in Indian context.

- The present study may be extended to explore the possibility of use of other types of weather derivative contracts like a collar or multi-trigger contract, or a combination of weather derivatives to mitigate weather risk, and not just vanilla put as has been addressed in the present study. Future research could focus on building a composite index combining rainfall, temperature and humidity or any other relevant weather variables.

- The effectiveness of any risk management strategy can be better judged with a portfolio concept. So the pricing and effectiveness of weather derivative can be tested not on a standalone basis, but from an overall risk management perspective of DVC.
The study does not include the effect of meteorological forecast in pricing mechanism. The current advanced meteorological forecasting system is capable of making forecast far ahead of adverse weather events. Hence, there is scope for further research to include the impact of useful forecasting in the pricing of specific weather derivative.