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AGRI-RISK MANAGEMENT IN INDIA: THE EMERGING PROSPECT OF DERIVATIVES IN RE-INSURANCE

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RESEARCH ARTICLE

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Abstract

Agriculture is the foundation of the Indian economy and therefore, a constant initiative is required to be made so as to protect the farmers from all the possible uncertainties that they are exposed to. The commodity futures market is likely to play a predominant role in providing protection but only from adverse price movements. Constant initiatives are being made by the regulators to increase the farmers' participation in such derivative trading. On the other hand, insurance protects the farmers from risks arising out of climatic disasters. Due to gradual change in climatic conditions, agriculture is becoming more susceptible to such disasters and crop-insurance, bearing high premium, is the only way out left for protection. Following the traditional mechanism, the insurers in India are facing challenges to offer the insurance at a low premium. The global scenario, especially in the developed countries, is different, where the mechanism of derivative trading is being applied to transfer the risks of the insurers so as to enable them to facilitate the farmers with crop-insurance at a competitive rate of premium. This study is an attempt to explore the prospective role of derivative instruments in the Indian insurance arena to manage and transfer the risks of the insurers arising due to climatic disasters.

Keywords: *Agri-Risk Management, Re-Insurance, Insurance Derivatives, Climatic Disasters, Catastrophe Index*

Introduction

Risk management in agriculture is of immense significance in every policy decision to strengthen the foundation of the economy. There are several dimensions of the risks associated with agriculture. The farmers need to seek protection from all such risks. As regards the risk arising due to adverse movements in price of the agricultural commodity, derivative trading in the form of futures contracts were introduced in India in the beginning of the twenty-first century. A constant initiative is being undertaken by the regulators to educate all the stakeholders of the agricultural sector with the strategies to combat such risk by seeking exposure in the derivatives market. On the other hand, regarding protection from the risk arising out of climatic disasters the farmers are either to avail of insurance or they have to remain unprotected as the rate of premium charged is very high. Due to the fact that the insurers, i.e. who provide protection to the farmers through insurance are compelled to charge high premiums as they follow conventional technique in policy-design to transfer the risk. The scenario in the developed countries, like the United States, is different, where the mechanism of derivative trading is applied to transfer the risks of the insurers so as to enable them to facilitate the farmers with crop-insurance at a competitive rate of premium. This study is an attempt to explore the prospective role of derivative instruments in the Indian insurance arena to manage and transfer the risks of the insurers relating to climatic disasters. To ensure efficiency in crop-insurance in India, such studies are likely to bring in sea-change in the risk transfer mechanism in the sector by incorporating the techniques of derivative trading as it is done in the developed countries.

Argi-Risk Scenario in India

Agriculture is the backbone of the Indian economy. However, the farmers along with the persons associated with this sector have not always shown enough proficiency in risk-management using proper instruments and as a result the sector has to lose competitiveness, especially in comparison with its global counterparts. A constant initiative, therefore, became indispensable by the regulators to bring in the market different risk management tools to safeguard from the risks. India has a long history of derivative trading as a risk management tool, but majorly it used to be conducted on OTC basis in the form of forward contracts and also in a scattered manner. The organized futures trading started at the beginning of the twenty-first century and the regulators are still trying their best to include a significant number of farmers and other stakeholders in the mechanism to provide risk-management benefits to combat adverse price movements. "*There is very low farmer participation in the commodity futures*

markets. In addition, it has been banned in several instances, depending on their contribution to overall inflation and price volatility"[1]. Along with forward and futures contracts, the option contracts have also been introduced recently to provide more efficiency in risk-management mechanisms. Thus, derivative trading is being used to obtain benefits of risk management in respect of adverse price movements under the aegis of the government.

The other type of risk, to which the stakeholders of the agricultural sector are exposed to, arises due to climatic disaster such as drought or thunderstorm etc. In this regard, insurance policy is likely to provide necessary safeguard from such risk. Unlike the futures contract, where a constant involvement is required by the farmers to obtain safeguard from the adverse price movements, the insurance does not require them to have strategic knowledge of risk management, rather it is the insurer who bears the risks on their behalf and transfers risks strategically as and when required. Now, as regards the risk which the insurer has to bear is being managed in India in the traditional way, i.e. either by the funds procured as premium or by re-insurance to another insurer, which leads to a high rate of premium of insurance to be charged for providing the protection. In the developed countries, such as the United States, the risk transfer technique of derivative trading is trying to be incorporated in risk transfer of insurers so as to make the process more efficient in providing insurance at a lower cost of premium to ensure more coverage and flexibility. The Indian economy, predominantly being agro-centric, has the immense potential to bring transformation in risk-transfer mechanism in the crop-insurance segment. Therefore, exploring the feasibility of such transformation considering application of various techniques of derivative trading must be analyzed.

Climatic Disasters in India and their Acuteness

With the gradual change in climate, the agricultural sector in India is becoming more susceptible to natural disasters, leading thereby to the uncertainty for the farmers who are majorly marginal in terms of their areas of land. "*India saw natural disasters almost every day in the first nine months of 2022, from heat and cold waves, cyclones and lightning to heavy rain, floods, and landslides*".[2] "*These disasters claimed 2,755 lives, affected 1.8 million hectares of crop area, destroyed 416,667 houses, and killed close to 70,000 livestock*"[2]. If the vulnerability of the farmers towards climatic disasters remains unprotected, the true development of the county shall be disrupted to a great extent.

Objectives of the Study

Gradual increase in the acuteness of the climatic disasters necessitates an efficient mechanism of crop-insurance to be offered at affordable premiums to the farmers. In this respect, a shift from the conventional approach of risk-transfer needs to be undertaken and feasibility of the modern approaches, as adapted in developed countries, is required to be examined in the Indian context. Application of derivative techniques in risk-transfer as regard re-insurance has, therefore, been given due consideration in the present study so as to bring transformation in the entire mechanism. The objectives of the study are as follows:

1. To analyze different derivative-based risk transfer techniques of re-insurance,
2. To point out the challenges of the same in the Indian context in respect of building up required eco-system.

Need & Prospect of Insurance Derivatives in India

The traditional approaches of risk management by the insurers to rely on the funds collected as premium or by re-insurance have certain drawbacks, such as:

- In respect of the regions which are more prone to natural disasters such as the coastal areas or earthquake zones etc., it is hard for the farmers to get insurance at an affordable premium from the insurers.
- The insurers, on the other hand, find it difficult to provide protection at a government regulated premium.
- Increased chance of occurrences of calamities, due to climatic changes, leads to high cost of insurance. The conventional approach of risk transfer fails to bring efficiency in the mechanism leading thereby to make crop-insurance beyond the reach of the farmers.

Thus, it becomes apparent that unless some major transformation can be brought in the insurance sector in the form of the strategies and tools to transfer the risks, the agricultural sector in India would be deprived of the services to get the necessary protection from the risks arising out of adverse climatic conditions. In this regard, the prospect of insurance derivatives needs to be explored in the Indian economy for better risk management by the insurers to protect the agricultural sector. In this study, the different types of insurance derivatives, which are being explored in the United States, would be proposed for the betterment of risk transfer scenarios in the Indian context. Broadly, these derivatives can be classified into two types, the first type is based on Catastrophe Index and the second type is in the nature of a Bond. They have been explored in the next segment as follows.

Exploring The Derivative Trading Mechanism for Re-Insurance

The increased chance of climatic disaster requires the risk-transfer mechanism in insurance, which may be called re-insurance, to be made more efficient so as to lower the cost to be charged in the form of premium from the farmers and other stakeholders. In this regard, derivative trading mechanisms as adopted in the developed countries, in respect of such risk-transfer, can be explored so as to assess their viability in the Indian context.

I. Based on Catastrophe Index

This index is calculated by the concerned insurance regulatory authority of the country considering the following matters:

i. Combined losses of several insurers are considered.
ii. Such losses must be due to catastrophe disasters.
iii. The index so calculated must be used to transfer the risk between the insurer and the capital markets.
iv. The scale of the index may be arbitrarily set.
v. The value of the index is highly correlated with the severity of the catastrophe.

The following are the different Catastrophe Index based Insurance Derivatives:

1. **Insurance Futures Contracts:** Similar to that of a financial or commodity futures contract, here the seller is obligated to pay the value of the index to the buyer at the predetermined price, known as strike price, on a future date. For example, a seller sells a 1-year Insurance Futures contract at a strike price of Rs. 100 on 1st January and to be executed on 31st December. Now if during the year there is no natural disaster the value of the index would be zero and the seller would make Rs. 100. However, if there is catastrophe and the index is determined at Rs. 600, the seller would have to pay Rs. 600 to the buyer and would lose Rs. 500.
2. **Insurance (Call) Option Contract:** Here, the contract gives the right but not the obligation to the buyer to buy the value of the index at an agreed upon price i.e. the strike price on a future date. For example, the seller offers the buyer to enter into the call option contract with a strike price of Rs. 100 at a premium of Rs. 20. Now if no such disaster arises during the year, no question would arise for the buyer to execute the contract and the seller would gain Rs. 20. If disaster arises, and the index is valued at Rs. 300 then the buyer would be able to buy the index at Rs. 100 from the seller and sell him back at Rs. 300. Thus, the buyer would be able to make a net gain of Rs. 180.
3. **Insurance (Call) Option Spread:** It is a combination of two option contracts simultaneously entered into by each other i.e. the seller as well as the buyer at two different strike prices known as covered layer of the spread. For example, Mr. A sells the index option contract with a strike price of Rs. 100 at a premium of Rs. 20 and Simultaneously Mr. B sells the same contract with strike price of Rs. 200 at premium of Rs. 10 to Mr. A. Now, if no natural disaster arises during the period both the parties would not execute the contract. Again, if there is catastrophe and the index is valued at Rs. 300, Mr. B would be able to make a net gain of Rs. 90 which would be the maximum amount of net loss to Mr. A. Thus, Option Spread contracts are used to limit the liability.

II. **Catastrophe Bond (CAT Bond):** It is another type of derivative instrument used in insurance where no such index is needed to be determined, rather the insurance company may design a product to provide better risk return trade-off to the common investors with the ultimate objective of transferring the catastrophe risk to a larger segment of the economy. Here, higher than the normal rate of interest is offered for the bond with the condition that if a specified natural disaster arises no payment would be made to the subscribers of the bond as regard the interest and or that of the principal amount. Due to less probability of occurrence of natural disaster and relatively at a high rate of interest the common investors can be attracted to subscribe in those bonds which may be further used by the investors for better diversification of portfolios.

Now, in the Indian context these insurance derivative instruments are yet to be exercised for better transfer and management of risk associated with climatic disasters where the insurers may play the roles of the buyers of the derivatives contracts. A sea-change can be witnessed if the policy makers can examine the viability of these tools for the better functioning and efficacy of the insurance sector to facilitate in protecting the interests of the farmers ultimately.

Benefits of Insurance Derivatives in India

To provide protection to the farmers from various risks that they are exposed to, constant initiatives are being made by the regulators, on behalf of the government, to explore new tools and strategies. As a result, the commodity futures market has been developed and timely addition of instruments such as options and option-futures are being made so as to facilitate the participants in better risk-return trade-offs. In relation to insurance, merely relying on the funds procured from premium may trigger the premiums as a constant increase in the climatic disasters is being experienced overtime. At this outset, the farmers would remain uninsured for the crops leading thereby to extreme consequences. Application of techniques of derivative trading, in this regard, is required to be explored so as to provide more efficiency in the crop-insurance segment to further assess the possibility of lowering premiums. Therefore, the following advantages can be pointed out regarding the insurance derivative instruments in Indian context:

- Exploring insurance derivatives would increase the depth of the sector and thereby it would ensure inclusion of a large number of participants to avail of the services.
- It would increase the profitability of the insurance companies which would lead to increased competitiveness to make the market more efficient.
- The cost of insurance would be declining to a great extent and also the coverage would be higher.
- The common investors would be able to participate in the market and thereby they would get the opportunity to diversify their portfolios which in turn would increase the efficiency of the capital market also.
- The financial sectors would be more organized and inter-liked to deliver best value to the society and also to the economy.

Challenges Likely to be Faced by Insurance Derivatives in India

To introduce something new in an economy is always challenging as all the related consequences must be carefully dealt with. The following are the notable challenges of introducing insurance derivatives in Indian economy:

- To introduce insurance derivatives in the economy, a strong regulatory mechanism must be designed and implemented well in advance.
- Proper control over the participants must be ensured for the fulfillment of the objectives. There may be a possibility that in the absence of control, the big houses may exploit the marginal participants.
- Adequate knowledge-sharing must be made to facilitate the participants get the best utility from the system.
- Adequate amount of data collection and analysis must be made in respect of catastrophe to develop the index which must be highly correlated with the disasters and their magnitude.

Conclusion

Agriculture is the foundation of the Indian economy, however the farmers are still inadequately exposed to sophisticated risk management tools like that of the farmers of the developed countries. The lack of strategic knowledge to deal with the various uncertainties in relation to adverse price movements in the market as well as climatic disasters coupled with the skeptical approach of the policymakers to provide new instruments of risk management are putting the sector far behind. In order to ensure the competitiveness of the Indian agriculture sector with that of its global counterparts, it is high time to take some brave decisions. Insurance derivatives, is therefore, being explored in this study to provide the insurers with modern techniques of risk transfer to bring larger areas under the preview of insurance to deliver better service to the agricultural sector which is yet to be treated uniformly across all the geographic locations within the country.

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