

MARTIN, P.: WEATHER BONDS IN INSURANCE

Presentation Synopsis: Weather Bonds in Insurance

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Introduction

The aim of the presentation is to look at a relatively new type of insurance product that is currently being written in the London Insurance Market.

Catlin

Catlin Underwriting Agencies Ltd manages Syndicates 1003 and 2003 in Lloyd's, part of the London Insurance Market. The Agency is owned partly by Western General Insurance Ltd and partly by the management and the staff of the Agency. Western General Insurance Ltd is part of the Western International Financial Group which is owned in parts by trusts primarily for the benefit of certain members of the Pritzker family of Chicago, Illinois.

Background

The insurance market in Weather Bonds has, to date, been primarily driven by the US Energy industry's requirements with only a small number of global reinsurance companies participating. Catlin, together with many others in the London market, have been researching this area over the last year or so and have just recently started to underwrite similar types of risks to the one described below. Although the current market in these contracts is heavily weighted to the US there have already been deals in both the UK and France.

It is likely that over the coming months, as both buyers and sellers understand more about the dynamics of these risks, more players will enter this market. Buyers looking to protect their balance sheet from weather related risk and sellers willing to provide the financial capacity. The London Insurance Market will be a major source of capacity for these products with its unique ability to develop products that are tailored to individual clients needs.

Product

The product described below is typical of the type of contract that is currently available in the US market. However, it is important to remember that there are many variants of this product.

The first step is to define an index that is based on daily temperature readings at a given location. The index is then calculated each day.

The assured (buyer) pays an insurer (seller) a premium for taking on the risk associated with the following policy.

If the aggregate value of the index over a set period is greater than a pre-set level, defined in the policy documents, then the insurer will pay to the assured £X for each index point above the pre-set level. There will also be a pre-set limit with regard to the maximum the insurer will pay out in total, the policy limit. If the aggregate value of the index over the set period is below the pre-set level then the insurer does not pay any money to the assured and retains the premium for assuming the risk.

Note that policies can also be purchased where the insurer pays out if the aggregate value of the index over the set period is below the pre-set level.

There are also many other types of coverage possible using, for example, snow, humidity, precipitation or wind speed as the trigger for payment. Policies are also available that use weather related values as only the first of several triggers that need to be breached before the insurer makes a payment back to the assured; these policies try to link coverage more directly to the individual clients risk profile.

The views in this paper are subjective and are those of the author and do not necessarily represent the views of any organisation with which the author is, or has been, associated.

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Definitions

Terminology can vary between markets so it is important to define the terms within any contract.

Cooling Degree Days ("CDD's")

This is the daily mean temperature in Fahrenheit minus 65.

The mean is the difference between the daily high and low temperatures.

The index value must be greater than or equal to zero for each day (negative values do not contribute to the aggregate total).

This is the index commonly associated with policies sold during the summer.

Heating Degree Days ("HDD's")

Similar to CDD's above except it is defined as 65 minus the daily mean temperature.

This is the index commonly associated with policies sold during the winter.

Strike

This is the pre-set level above (or below) which the insurer will pay the assured.

Put

These are policies that trigger payments from the insurer if the aggregate value of the index over the policy period is below the strike.

Call

These are policies that trigger payments from the insurer if the aggregate value of the index over the policy period is above the strike.

Tick

This is the financial amount that the insurer will pay for each point that the aggregate value of the index over the policy period is above (or below) the Strike.

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Example

For a specific weather station in the US a client wants to purchase the following policy.

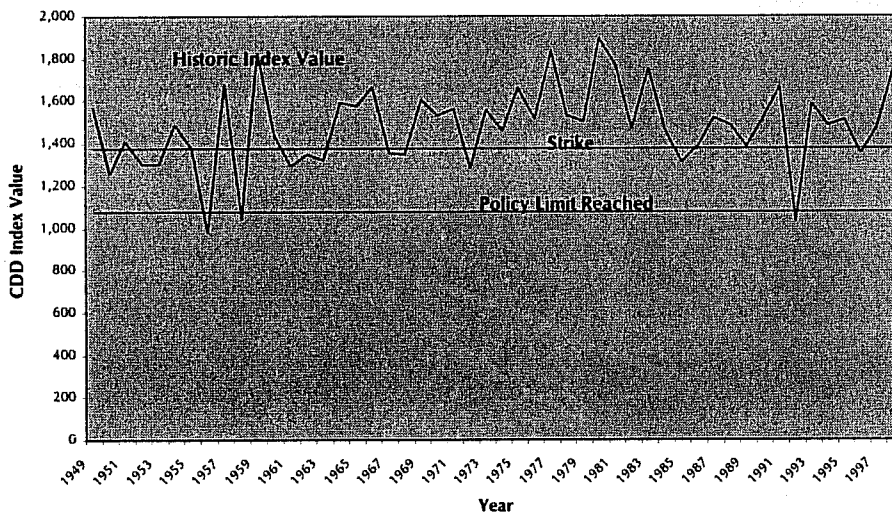
Policy Type: CDD Put
Policy Period: 1/5/99 – 30/9/99
Strike: 1,375
Tick: \$20,000
Limit: \$6,000,000

Therefore the policy will trigger a payment from the insurer to the policyholder if the aggregate value of the index between 1 May 1999 up to 30 September 1999 is below 1,375. For each point below 1,375 the insurer will pay \$20,000 but will only pay up to a total of \$6,000,000. Therefore if the aggregate value of the index over the policy period is equal to 1,075 or below the insurer will only pay out the full policy limit of \$6,000,000.

The key question an insurer will ask is how much should I charge for the risk I am assuming?

Data

Typically the available data, for a US risk, will be the last 50 years of the historic value of the index over the policy period (1 May to 30 September).



The insurer will then typically take into account the following factors before determining the price:

- a) the average cost to the insurer if the policy had been in place over the last 50 years;
- b) the expected cost based on statistical distributions of the index value over the historic period;
- c) changes to the physical location and equipment that influence the data;
- d) macro and local climatic trends; and,
- e) available weather forecast information.

The final price will depend critically on how the above factors are integrated into an overall pricing mechanism but may also crucially depend on the relationship between client and insurer and their overall strategies.

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Another key issue for the insurer will be its portfolio management. The insurer will need to know the values at risk at any point in time and will also need to understand the relationships within the underlying risks as well as any correlations that exist with other classes of business.

Summary

Opportunistic buyers and sellers may well look for anomalies in the market price and actively buy and sell contracts to minimise their potential downside whilst maximising their expected profit. This could well lead to a large and diverse market with both long term and short term players trading in standard products.

However, traditional insurers are not usually (best?) equipped to actively buy and sell derivative type contracts, especially in large volume. Generally insurers have looked to build on their existing relationships to provide long term solutions for their clients that minimise the downside to the clients profitability and protect their balance sheet from unmanageable and unforeseen risk. These contracts are just one of many that an insurer can provide that minimise a clients exposure to an underlying hazard.

If clients want to minimise their downside from weather related risks then the insurance market will be involved together with other financial markets. However, because parts of the insurance industry are perhaps more flexible and more willing to assume large sums at risk then it may be that its most significant contribution lay in combining these issues with other risks in bespoke deals tailored to individual client's requirements.

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