

Weather Derivative in Malawi



Mitigating the Impact of Drought on Food Security

Background

Malawi—a landlocked country in Southern Africa—is highly vulnerable to drought. Thirty-eight percent of the country’s GDP is dependent on agriculture, but rainfall is erratic. When a severe drought brought widespread hunger to the region in 2005, millions of farmers in Malawi needed food aid. The Government spent US\$200 million responding to the crisis. Donors also contributed a similar amount.

Objectives

The World Bank and other development partners have been supporting Malawi’s efforts to strengthen food security through agricultural technology, investments in irrigation, and development of grain markets. Malawi expressed interest in developing strategies to mitigate the impact of drought on the economy and the federal budget. It needed to access funds quickly in the event of a severe and catastrophic drought to reduce dependence on humanitarian appeals. The Bank responded by helping the Government transfer a portion of the risk of severe drought to the international financial market using weather derivatives. If a severe and catastrophic drought occurs, Malawi will receive funds from the weather derivative within days.

Structure and Description

The weather derivative contracts purchased by the Government of Malawi in 2008-09, 2009-10, and 2010-11 were structured as an option on a rainfall index. The index links rainfall and maize production, so that if precipitation falls below a certain level, the index will reflect the projected loss in maize production. Under the 2009-10 contract, if maize production in Malawi, as estimated by the rainfall index, fell significantly below the historical average, then Malawi would have received a payout of up to a maximum of US\$4.4 million. In the event of a drought, maize prices in the region typically increase. In 2009-10, the Government of Malawi agreed to use any payout from the weather derivative contract to lock in the price of maize imports before market prices increase as a result of poor harvest due to drought.

Highlights

- Malawi is heavily exposed to the risk of drought and food shortage.
- The World Bank’s intermediation on index-based weather derivatives allowed Malawi to transfer weather-related risk to market counterparts.
- This transaction marked the first time that the Bank offered a financial risk management tool to a low-income country.

The Bank acted as an intermediary between Malawi and reinsurance companies or investment banks for the transaction. Malawi was required to pay a premium upfront, which was financed by the UK Department of International Development (DfID).

Outcome

The index-based weather derivatives allowed Malawi to access the financial markets and transfer weather-related risk to market counterparts. This weather derivative was the first time that the World Bank offered a financial risk management tool to a low-income country. The contract has been renewed twice, in September 2009 and 2010.

It is important to note that the weather derivative contracts provide coverage for a specific percentage of drought risk in Malawi as part of a broader (maize) risk management program. Weather derivatives can help countries better plan, budget for, and implement proactive responses to natural disasters. These transactions can be customized according to each country’s specific needs based on the type of weather hazard, the desired level of protection, and the estimated financial loss associated with a severe and catastrophic event.

The use of weather derivatives and index-based insurance products in agriculture in developing countries is new, and the market is still evolving. As the World Bank intermediates on behalf of countries that do not have expertise in handling such financial instruments, it also helps build capacity, so that countries are eventually able to continue implementing risk management strategies independently.

Lessons Learned

1. **The primary technical precondition for this kind of weather derivative contract is an index that faithfully represents the risk and is constructed using data that adheres to quality requirements.** The weather derivative transactions in Malawi successfully tested the capacity of the Malawi Meteorological Services to transfer the rainfall data in real-time to international markets. Additional investment in the infrastructure of Malawi's Department of Climate Change and Meteorological Services will help improve the reliability of the index and the government's early warning system.

2. **An integrated approach to managing the risk of drought, for example one that combines weather and commodity price risk management, can provide the government with greater certainty about its ability to respond quickly and efficiently.**

3. **Index-based weather risk management cannot solve all of the challenges associated with a country's vulnerability to drought.** It is a financial tool that can be integrated into a comprehensive risk management strategy.

4. **Capacity building and technical support are important for the successful implementation of a weather derivative contract.**

Glossary

Option: When used in the context of weather risk management, a put option provides the country with access to a payout if the index falls below a pre-determined trigger level.

Premium: The cost of an option contract which is paid by the buyer to the seller of the contract.

Rainfall index: The rainfall index links rainfall and maize production, so that if precipitation falls below a certain level, the index will reflect the projected loss in maize production.

Risk transfer: The process of shifting the burden of financial loss or responsibility for risk financing to another party, through insurance, reinsurance, legislation, or other means.

Main Features: Malawi Weather Derivative

Dates	2009-2010
Type of Contract	Put option
Maximum Payout	US\$ 4.4 million
Term	6 months
Trigger	10% below historical average maize index, which links rainfall and maize production
Index	Maize production

Further Reading

Nucifora, A., & Syroka, J. (2010). National Drought Insurance for Malawi. World Bank Policy Research Working Papers.

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