

# Risk Financing Mechanisms – An Overview of Concepts and Approaches

Barry J. Barnett

Department of Agricultural Economics  
Mississippi State University  
USA

## Climate Change

- Climate change is expected to change the central tendency of important weather variables. For example, models generally predict higher average temperatures.
  - But regional projections of average temperatures vary greatly.
  - And projections regarding the timing of changes vary greatly.
- Climate change is expected to increase both the probability and the magnitude of extreme weather events.
  - But projecting changes in volatility is even less precise than estimating effects on the central tendency.

## Climate Change

- Lower income countries (LICs) will be most severely impacted. LICs generally:
  - have economies that are more dependent on agriculture;
  - have limited social safety nets; and
  - little risk mitigation infrastructure.

## Adaptation Investments

- Reducing risk exposure: infrastructure, education and training to prepare for modified or alternative livelihood strategies, new production technologies (e.g., improved seed varieties), etc.
- Risk transfer: insurance and other sources of contingent financing to recover from the occurrence of an extreme event.

## Adaptation Investments

- Decisions about adaptation investments must also be made in concert with decisions about other economic development investments.
- Economic growth in itself will tend to facilitate adaptation. Relatively wealthier (poorer) countries and individuals will be most (least) able to adapt to climate change.

## Risk Transfer

- Insurance markets are underdeveloped in most LICs. Traditional crop insurance or property insurance is not viable.
- Straightforward but effective mechanisms are needed to transfer catastrophic weather risks from LICs to international reinsurance and capital markets.
- Currently, much attention on “index-based” risk transfer mechanisms.

## Weather Index Insurance

- Insures against a specific extreme weather event, measured in a specified manner, occurring at a specific place during a specific time.
  - For example: insures against cumulative rainfall less than 100 mm measured at a specific weather station during the month of July.
- Could be based on various “weather” measures: temperature, flood levels, satellite imagery, etc.
- Insures against weather events that are extreme relative to the expected value.
- Will not insure against the longer run secular trend in weather variables caused by climate change.
- Limitation: Basis risk.

## Benefits of Insurance

- Insurance pricing sends a clear signal about the magnitude of risk exposure.
- Insurance increases financial resilience to extreme weather events. Payments can be used to:
  - Continue previous endeavors by replacing damaged assets; or
  - Make capital investments needed to pursue alternative endeavors.

# Subsidies?

- Buyer should pay premiums based on risk exposure.
- Premium subsidies can actually slow adaptation.
  - Create disincentives for policyholder to adopt risk reducing strategies.
  - Policyholders may even take on more risk – thereby increasing their vulnerability to climate change.
- Subsidies are least distorting for:
  - Start-up costs.
  - Administrative costs.
  - Catastrophic layer of risk.

# Summary

- Economic growth will tend to facilitate climate change adaptation.
- Adaptation investments must be carefully allocated across interventions that improve risk mitigation and/or risk transfer.
- Extreme weather events may become more prevalent and severe with climate change. Weather index insurance is one mechanism for transferring these risks.
- However, adaptation involves much more than just insurance!
- Weather index insurance will *not* insure against the longer run secular trend in weather variables caused by climate change.
- Insurance premium subsidies can actually create disincentives for adaptation. Any subsidies should be carefully focused to reduce the likelihood of this occurring.

## Comments based on:

- Collier, B., J. Skees, and B. Barnett. "Weather Index Insurance and Climate Change: Opportunities and Challenges in Lower Income Countries." *The Geneva Papers on Risk and Insurance* 34(2009):401-424.
- Barnett, B.J., C.B. Barrett, and J.R. Skees. "Poverty Traps and Index-Based Risk Transfer Products." *World Development* 36(2008):1766-1785.
- Skees, J.R., B.J. Barnett, and A.G. Murphy. "Creating Insurance Markets for Natural Disaster Risk in Lower Income Countries: The Potential Role for Securitization." *Agricultural Finance Review* 68(2008):151-167.