Challenges of Yield Cover Pricing:
A reinsurer view

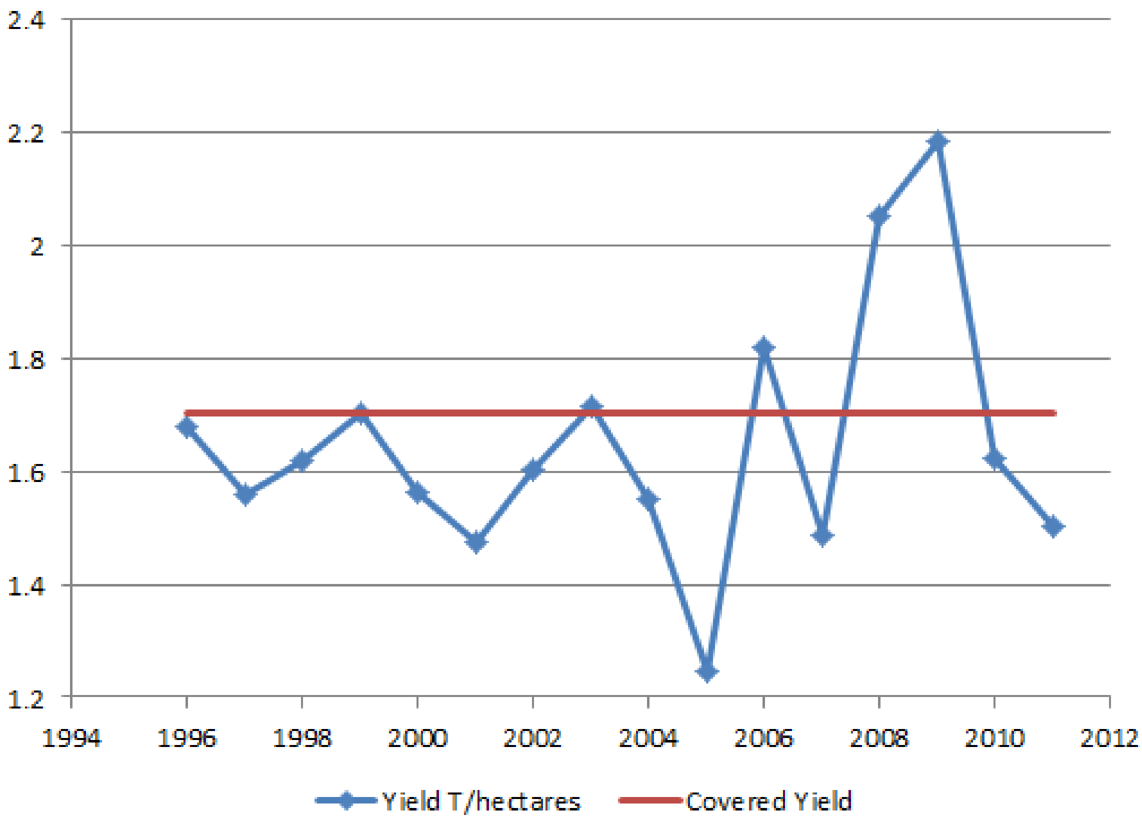
Fanny Rosset
IARFIC, 23.06.2014

SCOR

In theory…

- ❑ Historical yield data
- ❑ Covered yield
- ❑ Level of deductible

As-if loss history → Final rate



Source: Canola yield, Manitoba, Canada

Covered Yield	1.702
Deductible	10%

years	Yields	Loss FGU	Loss after deductible
1996	1.681	1.2%	0.0%
1997	1.561	8.3%	0.0%
1998	1.620	4.8%	0.0%
1999	1.702	0.0%	0.0%
2000	1.564	8.1%	0.0%
2001	1.475	13.4%	3.4%
2002	1.605	5.7%	0.0%
2003	1.715	0.0%	0.0%
2004	1.550	9.0%	0.0%
2005	1.246	26.8%	16.8%
2006	1.820	0.0%	0.0%
2007	1.487	12.7%	2.7%
2008	2.054	0.0%	0.0%
2009	2.184	0.0%	0.0%
2010	1.625	4.6%	0.0%
2011	1.501	11.8%	1.8%

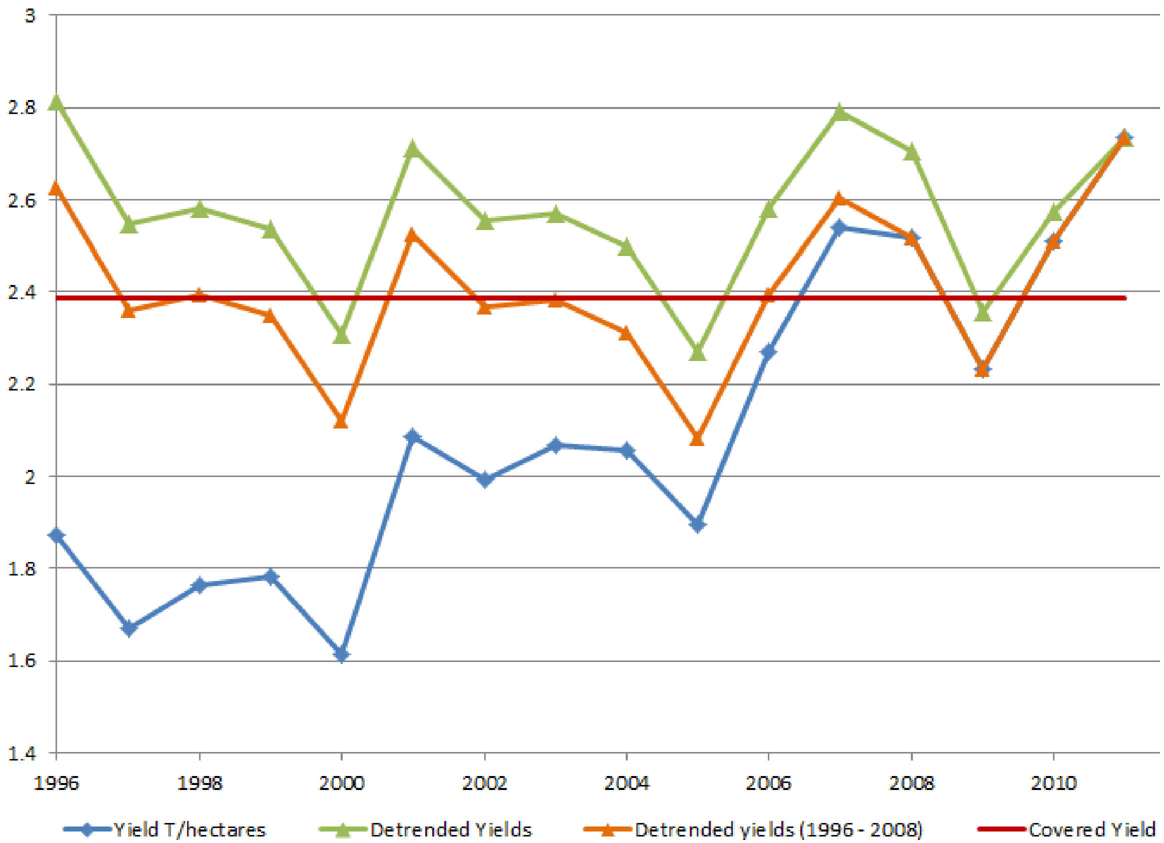
Burning rate 1.5%

… In practice: in an emerging market

An Indian example

- Historical yield data: *block and crop level*
- Covered yield*: 7 years average at block and crop level*
- Level of deductible: *10% to 20%*

As-if loss history → Final rate



Source: Wheat yield, Vikasnagar, India

Issue: yield trend

Solution: detrending

- Which method to use?
- Over which period?
- Sensitivity of the results?

Questions

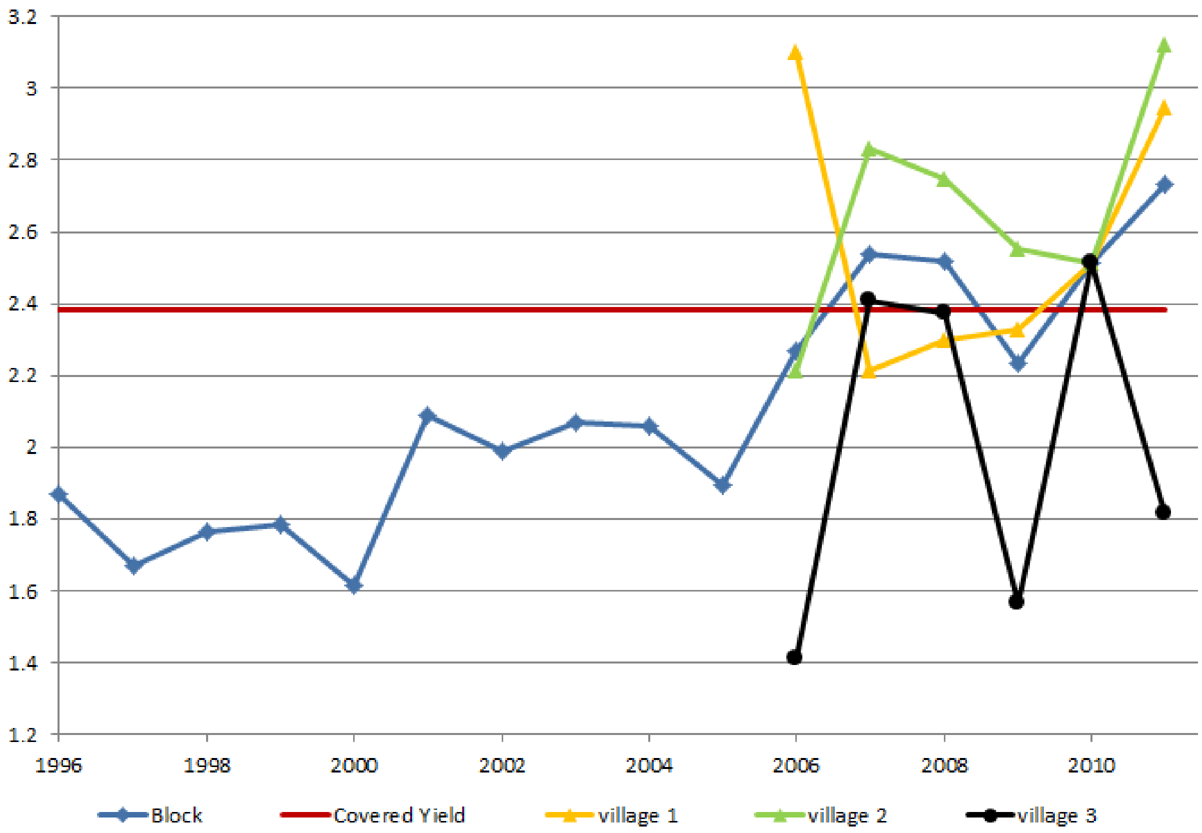
- Possible reason for the trend? (e.g., farm practice, technology, loss assessment methodology, other?)
- Why do we see jumps in 2001 and 2006?
- Will the trend continue?

… In practice: in an emerging market

An Indian example

- ❑ Historical yield data : *block and crop level*
- ❑ Covered yield *: 7 years average at block and crop level*
- ❑ Level of deductible : *10% to 20%*

As-if loss history → Final rate



Issue : yield heterogeneity

- ❑ Actual yield: assessed at Village level

Consequences

- ❑ Potential inadequacy of covered yield,
- ❑ Underestimation of the yield volatility.

Source: Wheat yield, Vikasnagar, India

… In practice: In mature markets
Some similarities

- **Yield trend**:
  - Change in farm practices, increase of farm size
  - Detrended yield coverage

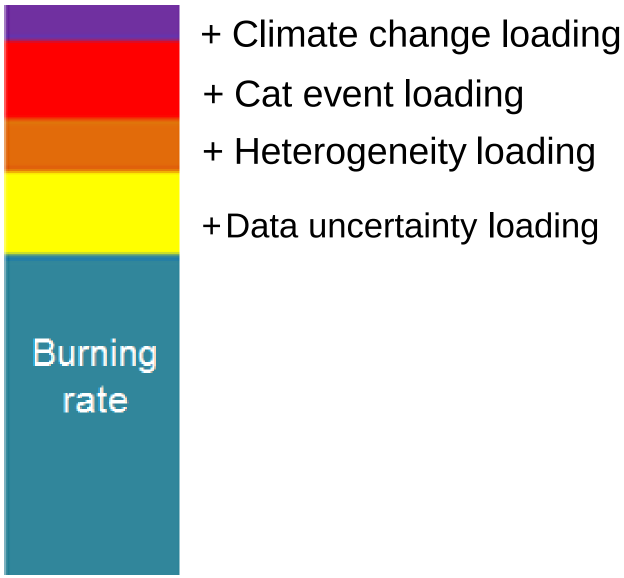
- **Heterogeneity**:
  - Coverage at farm level vs. rating at a higher geographical level

- **Loss adjustment**:
  - Change in the methodology
  - Change in indemnification table

- **Policy wording**:
  - Inclusion of new perils
  - Change in the waiting periods, date of coverage

… In practice
How to deal with these challenges?

- Loadings?



- Lower coverage level?
- Crop yield model? (Plant model/ Weather/ Satellite)
- Others?