Microinsurance:
Small Insurance Policies making a **BIG** Difference
Doug Lacoss

**Microinsurance**

**Agenda**

- What is Microinsurance anyway?
- Special considerations for developing markets
- Microinsurance Working Party / MIG
  - Actuarial Toolkit
- Case Studies
  - AKSItext
  - Kilimo Salama
  - Mi Life
- Opportunities to get involved
What is Microinsurance?

IAIS definition

- Not a specific product or product line
- Not limited to a specific provider type
- Provision of cover to a specific market segment
- i.e., “low-income persons.”

What is Microinsurance?

- But how low is “low-income”? 

Rich and Poor: GDP per head in 2011

Source IMF World Economic Outlook Database, April 2012
What is Microinsurance?

- But how low is “low-income”?
- Is insurance “micro” due to
  - Target insured population?
  - Insurer?
  - Distribution channel?
  - Type of product?

Being poor is risky

‘One of the least remarked-on problems of living on two dollars a day is that you don’t literally get that amount each day. The two dollars a day is just an average over time. You make more on some days, less on others, and often get no income at all.’

‘How do you make sure there is something to eat and drink every day, and not just on the days you earn? If that seems hard enough, how do you deal with emergencies?’

Portfolios of the Poor, Collins et al. (2009)
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Microinsurance – Some basic considerations

• Affordable
• Simple
• Verifiable
• Beneficial
Microinsurance – Some basic considerations

- Basis risk and index insurance

How high is basis risk in weather index insurance?

Across all 318 products sold in one state in India
- Correlation between yield and claim payment only -13%

Across all 318 products sold in one state in India

- If lost entire crop there is a 1-in-3 chance you would get no claim payment

How high is basis risk in weather index insurance?

Subdistrict average yield, as percentage of average historical yield...

Probility that WBCIS claim payment is positive


How high is basis risk in weather index insurance?

Malawi index insurance products

- (~12 years of matched data)

<table>
<thead>
<tr>
<th>Station</th>
<th>Crop</th>
<th>DSSAT/hist. yields</th>
<th>WRSI/hist. yields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lilongwe</td>
<td>Groundnut</td>
<td>13%</td>
<td>31%</td>
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<td>Maize</td>
<td>17%</td>
<td>38%</td>
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<tr>
<td>Kasungu</td>
<td>Groundnut</td>
<td>-1%</td>
<td>39%</td>
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<td>Maize</td>
<td>37%</td>
<td>77%</td>
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<td>Nkhotakota</td>
<td>Groundnut</td>
<td>10%</td>
<td>35%</td>
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<td>Maize</td>
<td>-22%</td>
<td>-6%</td>
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<td>Chitedze</td>
<td>Groundnut</td>
<td>30%</td>
<td>52%</td>
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<tr>
<td></td>
<td>Maize</td>
<td>1%</td>
<td>24%</td>
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<tr>
<td>Average</td>
<td></td>
<td>11%</td>
<td>36%</td>
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</tbody>
</table>

The quest for better indices

- A good index should capture local aggregate shocks
  - Particularly if there is some risk pooling within a community
- Weather indices seem to miss too many of these shocks
  - Due to imperfect calibration, imperfect functional form, or missing perils
- Total production indices can accurately capture aggregate shocks
  - Based on sample (e.g. sample-based area yield) or population mean
  - Area yield can be nearly as good as MPCI (Deng et al. 2007)

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Work by UK actuaries on microinsurance: The Microinsurance Working Party

- October 2009-September 2010 (5 members)
  - Microinsurance Working Party formed following GIRO 2009 to review literature on crop microinsurance from an actuarial perspective
  - Won the Brian Hey Prize at GIRO 2010
- October 2010-July 2011 (>10 active members)
  - Members from UK, USA, West Africa, Mexico, Caribbean, Jordan, Pakistan, India etc
  - Working out what to do next, in collaboration with partners (IAA and microinsurance organisations)
- July 2011-present (>15 active members + partners)
  - Development of an educational tool for microinsurance (the ‘microinsurance toolkit’)
  - Funding from the UK Actuarial Profession for dissemination
- November 2012
  - Launch of microinsurance toolkit at the International Microinsurance Conference

Work by UK actuaries on microinsurance: The Microinsurance Working Party

- Educational resource for technical microinsurance practitioners
- Being developed on a volunteer basis by qualified actuaries
- Will cover life, health and agricultural insurance
- Consists of set of spreadsheets and supporting documentation
- Will be launched at 2012 Microinsurance Conference in November 2012
  - Eventually will include Life, Health, Agri
- For more information see http://www.stats.ox.ac.uk/actuarialtoolkit
- Or email actuarialtoolkit@stats.ox.ac.uk
- Thanks to the Actuarial Profession for significant funding of this project!
Work by UK actuaries on microinsurance: The Microinsurance Working Party

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<tr>
<td>10</td>
<td>This spreadsheet forms part of the following version of the toolkit</td>
<td>CurrentVersion</td>
<td>Beta v0.4</td>
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<tr>
<td>11</td>
<td>For the latest version of the toolkit see</td>
<td>Website/Link</td>
<td><a href="http://www.stats.ox.ac.uk/actuarial/toolkit">http://www.stats.ox.ac.uk/actuarial/toolkit</a></td>
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<tr>
<td>13</td>
<td>What happens in each sheet</td>
<td></td>
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<td>14</td>
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<tr>
<td>15</td>
<td>Introduction</td>
<td>Overview of this workbook</td>
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<tr>
<td>16</td>
<td></td>
<td>Description of technical terms used in this workbook</td>
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<tr>
<td>17</td>
<td>Glossary</td>
<td>Illustrative randomisation calculation for agricultural insurance.  (Each step is covered in more detail in the remaining worksheets.)</td>
<td></td>
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<tr>
<td>18</td>
<td>IllustrativeCalc</td>
<td>Data collection and cleaning: importance of a standardised procedure and how to allow for changes in data collection.</td>
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<tr>
<td>19</td>
<td>DataCleaning</td>
<td>Worked example for accounting for trends in historical data.</td>
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<tr>
<td>20</td>
<td>Detrending</td>
<td>Worked example demonstrating why care is required if the same data is to be used for product design and pricing.</td>
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<tr>
<td>21</td>
<td>Overfitting</td>
<td>Demonstration of the importance of spatial smoothing. Worked example using credibility theory.</td>
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<td>22</td>
<td>CredibilityTheory</td>
<td>Calculation of PMIs for use in cost of capital calculations.</td>
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<tr>
<td>23</td>
<td>PortfolioAnalysis</td>
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<td>24</td>
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Detrending illustration

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<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
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<tbody>
<tr>
<td>Area-average yield for subdistrict Mahuva (kg/ha)</td>
<td>1073</td>
<td>867</td>
<td>1399</td>
<td>597</td>
<td>1463</td>
<td>1929</td>
<td>2061</td>
<td>2176</td>
<td>2270</td>
<td>1997</td>
</tr>
<tr>
<td>Claim payment rate at 1700 for Mahuva using raw yield data</td>
<td>37%</td>
<td>49%</td>
<td>18%</td>
<td>65%</td>
<td>14%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Area-average yield for subdistrict Mahuva, after removal of linear detrending of 90kg/ha/year (kg/ha)</td>
<td>2023</td>
<td>1722</td>
<td>2159</td>
<td>1262</td>
<td>2033</td>
<td>2404</td>
<td>2441</td>
<td>2461</td>
<td>2460</td>
<td>2092</td>
</tr>
<tr>
<td>Claim payment rate at 1700 for Mahuva using detrended yield data</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>26%</td>
<td>0%</td>
<td>0%</td>
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Case Study – AKSItext

AKSItext - Philippines

• Personal accident cover
• Set up policy by SMS: name, birthdate, address
• Cost – 15p for 15 days of cover, paid from mobile account
• Benefit - £150, paid via cheque

Case Study – Kilimo Salama

Kilimo Salama - Kenya

• Agricultural rainfall-index insurance
  – Secure, solar-powered weather stations
• Partnership Syngenta, UAP, Safaricom
• Pilot 2009 with 200 farmers, now covers 22,000
• Policy purchased at agri merchant (seed, fertilizer)
  – Transacted through M-PESA and mobile apps
    – Dealer sends info through specially equipped phone
    – Farmer receives policy info and payments via personal phone

Source: Microinsurance Compendium vol II, p. 534
Case Study – Mi Life

Mi Life - Ghana

- First fully mobile payments-based insurance product
- Partnership between MTN Ghana, MFS Africa, MicroEnsure, UT Life, Hollard Insurance, with low administration costs

✓ Cost – between £0.40 and £1.15 monthly premium
✓ Benefits - £200 to £800 for 2 beneficiaries
- Can be fully transacted through mobile phone
  - Policy registration, policy number
  - Monthly payments, payment reminders
  - Claim notification, claim payment

Source: Microinsurance Compendium vol II, p. 544

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Microinsurance – Get involved

Opportunities for actuaries in microinsurance

• Join the Microinsurance MIG with the Actuarial Profession
  – MIG meeting at Staple Inn, 10 Dec 2012
• Read (or at least skim) the Microinsurance Compendium vol. 2
• Join the Microinsurance Network – free for IAA members!
  – Read newsletters
  – Go to the Microinsurance Conference Nov 2012
  – Become a consultant, for example
    – Health insurance programme in Senegal
    – GIZ climate change research
    – Indian regulatory regime
    – Mongolian livestock insurance…

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

At least 82% of the views expressed in this presentation are those of the presenter.