Client data in inclusive insurance

IMC Panel Session
November 2018
Introduction to alternative data
Using Data to Drive Inclusive Insurance
Microinsurance conference Nov 2018 Zambia
In Hollard Life, we believe data is an essential enabler of our purpose.

- Predicting and providing the right products to the right customers at the right time
- Personalised, life-stage appropriate solutions
- Enhanced access to insurance and additional, non-insurance solutions
- Understanding customer needs and helping address them

Creating better futures by ensuring our customers’ dignity and dreams
We use credit bureau data to better target customers and manage affordability – creating value for customers and Hollard

- **Score before POS**
  - Batch scoring

- **Score at POS**
  - Real-time scoring

- **Score directly after POS**
  - Batch scoring

- **Score after POS**
  - Batch scoring

- **Evolved from using GLM modelling to machine learning champion challenger**

- **Evolved from using bureau data to internal data**

New customers

Existing customers
We have to use phone number matching to obtain bureau data and the score outcome is used to influence dial strategies and interact with customers.

Lead is sent through scoring engine

- Can Afford (10 Dial Attempts)
- Under Pressure (5 Dial Attempts)
- Cannot Afford (1 Dial Attempt)
- Not Scored/Unmatched (5 Dial Attempts)

Each group was dialled differently with the aim of generating the most sales from the can afford bucket.
Reducing poor quality sales results in less overburdened customers and right-sizing of the entire value chain.

**Sales volume**
- With 'Cannot afford': 63%
- Without 'Cannot afford':

**NTU & Lapse volumes**
- NTU's: 50%
- Lapses: 41%

**Premium collection**
- With 'Cannot afford': 83%
- Without 'Cannot afford':
We are starting to explore partner data – with an initial focus on retail shopper data – to better manage risk

<table>
<thead>
<tr>
<th>Retailers</th>
<th>Funeral Parlours and Brand affinities</th>
<th>Credit providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Customer shopping data</td>
<td>• Customer engagement data</td>
<td>• Credit payment behaviour</td>
</tr>
</tbody>
</table>

**Basket-level data gives us:**

- A more holistic understanding of customers
- Enhanced ability to identify unknown correlations between retail and insurance behaviour
- A greater ability to provide the right product to the right customer at the right time
- The biggest challenge which has delayed this work has been to find a model to access the data
But we are also careful not to ignore the value inherent in internal customer data and behaviour

- Data is **immediately accessible**, which helps with **ease of use**
- It is a **powerful predictive tool of our own book performance**
- Can allow **more personalised risk pricing** to potentially widen access
- Enables us to help customers with needs met by other financial solutions
  - **Credit (multiple categories), savings, and insurance are used interchangeably** to meet some needs and if we can predict and assist, we can provide the most appropriate solutions
  - We can also **make credit more affordable** (esp. for low-income customers) by using insurance experience and data as proxy collateral for credit scoring
  - Opportunities for synergies are vast – **education funding, development loans, home loans, incremental building funding** – it just requires **intelligent design**
All of this must be customer-needs led – and trust remains the biggest driver and threat to non-traditional engagement channels.
Picture-Based Insurance
Smartphone Pictures for Affordable Crop Insurance

Francisco Ceballos
Associate Research Fellow, International Food Policy Research Institute (IFPRI)

International Microinsurance Conference
Lusaka, November 8\textsuperscript{th}, 2018

Research team: Berber Kramer, Tim Foster, Koen Hufkens, Samyuktha Kannan, Miguel Robles

Partners: HDFC ERGO General Insurance Company, Borlaug Institute for South Asia
Challenges in agricultural insurance

Traditional indemnity-based insurance:
- High administrative costs, asymmetric information (e.g. moral hazard)
- Limited supply to small farmers

Index-based insurance designed to overcome these challenges
- Issues: Basis risk, understanding, and farmer engagement

Picture-Based Insurance (PBI) to combine the best of both worlds?
- Taking advantage of increasing smartphone penetration in rural areas
- Easy-to-understand, high farmer engagement, and reduced basis risk
- Augmenting information flow to the insurer
PBI: Seeing through a farmer’s eyes

1. Mobile application
2. Farmer monitoring crops
3. Data visualization
4. Decision-making panel
5. Damage degree and percentage of sum insured
6. Claim submission

<table>
<thead>
<tr>
<th>Degree of damage</th>
<th>0-19% (none/mild)</th>
<th>20-49% (moderate)</th>
<th>50-74% (severe)</th>
<th>75-100% (extreme)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of sum insured</td>
<td>0%</td>
<td>35%</td>
<td>65%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Formative evaluation

RCT in Haryana and Punjab, India
50 villages, 750 wheat producers

RESULTS:

1. Considerable farmer engagement ✓
   - 67% provided at least one picture per month
   - Many farmers liked visiting plot more often

2. Picture-based monitoring helps reduce basis risk ✓
   - Particularly suitable for severe damage (where WBI performed poorly)

3. The approach improves demand for insurance ✓
   - Higher WTP for PBI, but still below actuarially-fair premiums

4. No evidence of tampering or moral hazard ✓
   - No moral hazard: Similar input use and yield
   - No tampering or fraud observed (manual review of pictures)
Value-added services: Advisories

Incorporated during second year, evidence indicates:

- Enhanced farmer engagement
- Improved knowledge of agricultural practices
- Potential reduction in insurer’s risk exposure
Looking ahead: Automation is key to bring to scale

Horizon detection and region-of-interest (ROI)

Normalized greenness predictive of growth stage

Work in progress: Automating damage detection through ML algorithms

- Large training sets required, two seasons is not sufficient
Picture-Based Insurance: What’s Next?

- **4-Year Impact evaluation**, with focus on higher value/risk crops (e.g. tomatoes) and other states (e.g. Odisha)

- **Alternative scaling-up strategies + value-added services** (advisories, pest detection, credit, etc.)

- **Ensuring technology is transferable to other geographies and crops**, with particular interest in Africa

- **Vision**: Not a stand-alone product; use PBI to reduce basis risk within existing index-based products
For more information:

[Image of researchers in a field]

For more information:

Project notes and more available at: https://www.ifpri.org/project/PBInsurance

THANK YOU!
Munich Re: Alternative Client Data for Inclusive Insurance

Belhassen Tonat
btonat@munichre.com

8 November 2018
Agenda

Financial Inclusive Insurance
- What is it?
- Pain points

Alternative data cases
- Claims processing
- Drones
- Satellite / Aerial Imagery

IoT and Risk Management
- HSB
- Bosch
- Relayr
Financially Inclusive Insurance

Over 2 billion adults worldwide currently lack access to affordable financial products and services
(By CGAP (Consultative Group to Assist the Poor))

20 October 2018 a blaze tore through an informal settlement in Khayelitsha, Cape Town, South Africa – 1 dead and thousands displaced

Source: Google
Alternative data source cases

Source: Google
Drone deployment with PrecisionHawk

Accelerate post-disaster response with high-resolution real time imagery

In 2017 Ecuador’s 7.8 magnitude earthquake occurred. Within days drones were deployed to assess damage a process that previously took weeks

Municipalities can prioritize clean up and repairs to quickly return to full function post-catastrophe

Source: Google
Remote Sensing Initiative

Satellite / aerial imagery

Roof damage and assessment of monetary value

Immediate automatic pay-out

Munich Re’s solution will be able to cut the loss adjuster’s effort by 50% or even 66%
Use of sensors to predict malfunctions and seek to avoid them

Optimise production by considering connecting manufacturing process

5 - 10% higher production performance by reducing scrap

75% of all maintenance tasks can be carried out remotely
Early warning system for building owners, schools, religious groups and other organizations

HSB’s IoT service saved customers more than $500,000 by avoiding property losses from frozen pipe leaks

Responds within 3-5 seconds in the event of e.g. indication of water damage initiate closer of valve within 3-5 seconds
IoT Partnership with Relayr

- IoT power that uses insights from existing equipment, machines and production lines to improve our customers’ experience.

- Ultrafast time to market; a new heat treatment line can be in place in days instead of standard 6-12 months.

- Reduced maintenance costs with Predictive Maintenance providing 16% uptime increase.
Thank You
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Data types and use cases in insurance

Product development

Sales

Premium collection

Servicing and risk management

Claims processing

**Internal data**
- Information provided on sign-up
- Transactional
- Biometric identifiers
- Psychometric data
- Complaints and call centre data
- Customer interviews

**External data**
- Survey data
- Government (open data)
- Satellite/aerial imagery
- GIS data
- CDR and airtime
- Credit history
- Mobile money data
- Social media data
- Smartphone data
- Sensor (IoT) data
- Image metadata
The insurance product lifecycle and data uses

Source: Hunter, et. al, 2018

Data types

Legend

Fewer

More

Insurance value chain

- Product development
- Sales
- Premium collection
- Servicing and risk management
- Claims processing

Internal

External

Data types

- Transactional (financial)
- Information provided on sign-up
- Biometric identifiers
- Information from the mobile
- Complaints and call centre data
- Customer interviews
- Survey data
- Government data
- Credit bureau data
- Satellite/aerial imagery
- Geographic Information Systems (GIS) data
- Call detail records (CDR) and airtime
- Credit history
- Mobile money data
- Social media data
- Smartphone data
- Sensor (IoT) data

Source: Hunter, et. al, 2018
Most observed use cases are for identity and clients reached.

Source: Hunter, et. al, 2018
Emerging use cases of data applications

Data types:

- Tailored premium collection
- Reduce risk behaviour
- Cheaper claims processing

Product development
Sales
Premium collection
Servicing and risk management
Claims processing

Source: Hunter, et. al, 2018
Key trends

• **Limited quality customer data** available
• Client data becoming a strategic priority
  - **Focus for most – internal data:**
    ▪ Standardising customer data capturing and storage
    ▪ Linking data systems to create single-customer views
  - Some experiments with:
    ▪ **Test and learn / trial-and-error approach**
    ▪ **Innovation departments**
Client data in inclusive insurance

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Four questions

1. Does picture-based loss monitoring help reduce basis risk?
2. Can pictures be used to monitor crop growth stages?
3. Does this approach improve demand for insurance?
4. Should we worry about tampering and moral hazard?
Lower yields among farmers with insurance payouts?

Weather index-based insurance

<table>
<thead>
<tr>
<th>CCEs Yield (Quintals per acre)</th>
<th>No payout</th>
<th>Payout</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.84</td>
<td>19.82</td>
</tr>
</tbody>
</table>
Picture-based loss assessment performs better

<table>
<thead>
<tr>
<th>Agronomers say: 0–20% damage</th>
<th>Actual yields: 20 quintals/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agronomers say: 20–50% crop damage</td>
<td>Actual yields: 18.2 quintals/acre</td>
</tr>
<tr>
<td>Agronomers say: 50–100% damage</td>
<td>Actual yields: 10 quintals/acre</td>
</tr>
</tbody>
</table>
Comparison with area-yield index-based insurance
Normalized greenness is predictive of growth stage

Application for weather insurance: cover a specific crop growth stage instead of a fixed calendar period, which can help shorten the coverage period and reduce costs.

Note: ‘Gcc’ stands for green chromatic coordinate, with its value normalized by the maximum gcc for the site. See details in Hufkens et al. (2018)
Comparison: Example site

- A. Comparative graph showing Gcc / HLS EVI over time from November to March.
  - PBI Gcc
  - HLS EVI

- B. End of Tillering
- C. Start of Heading + Ripening
- D. Lodging

Images below illustrate the timeline:
- November: Early vegetation growth
- January: Mid-season tillering
- February: Transition into heading and ripening
- March: Mature stage with signs of lodging

Legend:
- Blue circles: visible ears
- Pink circles: visible soil
- Yellow circles: other

Note: Graph and images are from IFPRI.
Four questions

1. Does picture-based monitoring help reduce basis risk? √

2. Can pictures be used to monitor crop growth stages? √

3. Does this approach improve demand for insurance?

4. Should we worry about tampering and moral hazard?
Demand is higher for PBI than for WBI
No evidence of tampering or moral hazard
Scale-Up Plan

1. STATE OF HARYANA (0.74 million)
   Scale-up model: Commercial, retail approach

2. STATE OF ODISHA (1.77 million)
   Scale-up model: Link with digital crop registry

3. STATE OF TAMIL NADU (0.6 million)
   Scale-up model: Link with digital crop registry
   Scale-up model: Link with PlantWise

4. ALL INDIA
   Scale-up model: Couple with national insurance scheme (PMFBY)