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GI Insurtech Working Party Parametric Workstream

The Parametric Landscape & Case Studies

Presenting at Singapore Actuarial Society Superweek:

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Executive Summary

- Parametric insurance is based on the usage of a parameter that is correlated to the loss. Unlike traditional indemnity products, a *measurable trigger* and *fixed compensation* are agreed in advance, leading to fast payout and low claims administration costs
- Historically, providers have been providing bespoke services mainly on climate/cat perils for large risks
- Enabled by technology, better data and modelling techniques, a newer cohort of insurtech offerings are moving towards off-the-shelf products focused on SMEs and individual customers, helping meet gaps in indemnity cover, providing liquidity when needed and covering otherwise uninsurable risks.



Agenda

- Where is parametric insurance today & how insurtech is enabling it
- Case Studies
 - Commercial Lines: Floodflash, Swiss Re, Qomplx, Skyline Partners
 - Personal Lines: Swiss Re & NTUC Income
- Where do actuaries fit in: pricing and product development, capital, reserving
- Future of parametric insurance





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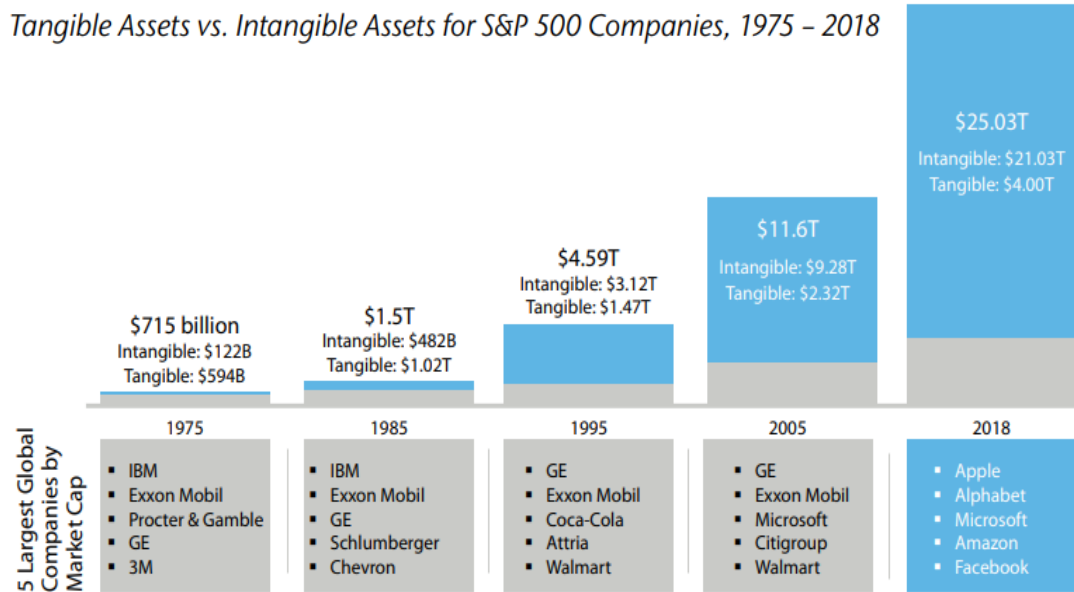
The Parametric Landscape

Where is parametric insurance today?



There is increasing gap between what traditional indemnity insurance can cover vs the risk landscape

Tangible Assets vs. Intangible Assets for S&P 500 Companies, 1975 – 2018



- Intangible asset growth far exceeds tangibles – in the S&P 500 the value of intangibles passed that of tangibles in the early 1990s; by 2018 the ratio is 5:1
- Risk landscape:
 - Uninsurable risks, e.g. terrorism and pandemic
 - Intangible losses, e.g. cyber losses, climate related losses

* Five largest Global Companies by Market Cap as of December 31, 2018

Tangible assets refer to property, plant and equipment.

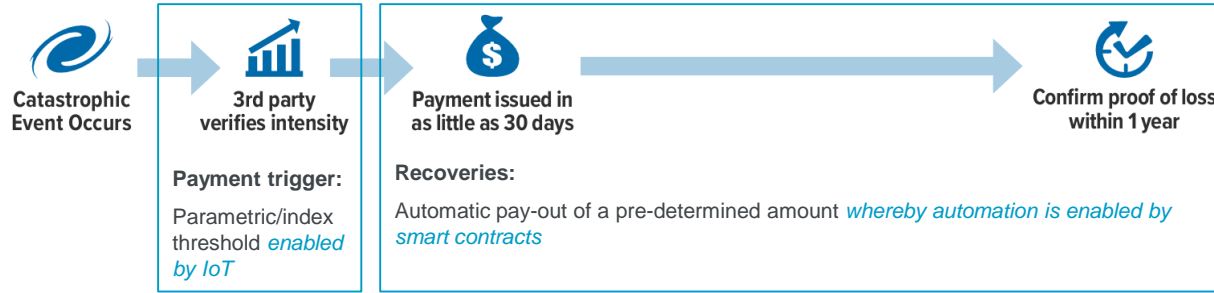
Source: 2019 Intangible Assets Financial Statement Impact Comparison Report, Aon / Ponemon Institute LLC (April 2019)



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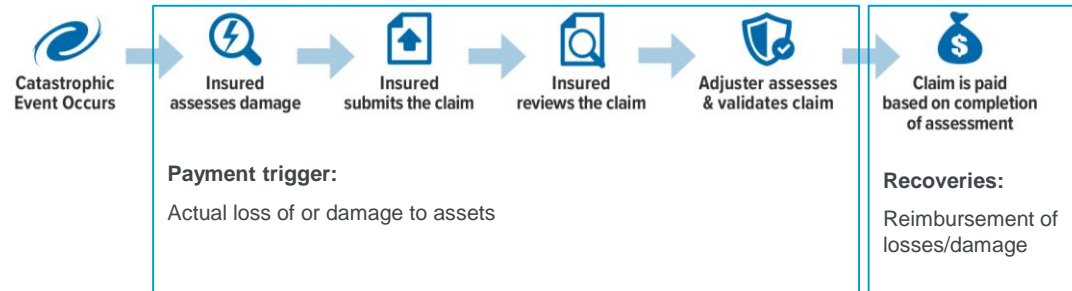
Parametric insurance closes the protection gap between insured and uninsurable losses

PARAMETRIC INSURANCE



Protect Cash Flow

INDEMNITY-BASED INSURANCE



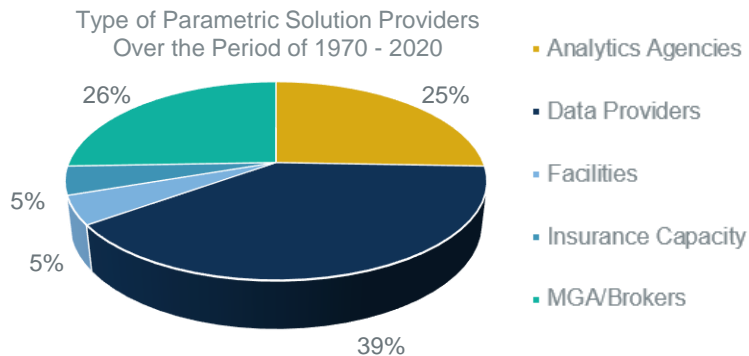
Protect Balance Sheet

Source:
 (Image) How Parametric Products Benefit Catastrophe-Driven Risk Transfer, AmWINS Group, Inc. (19 March 2020)
 What is parametric insurance?, Swiss Re Corporate Solutions (01 August 2018)

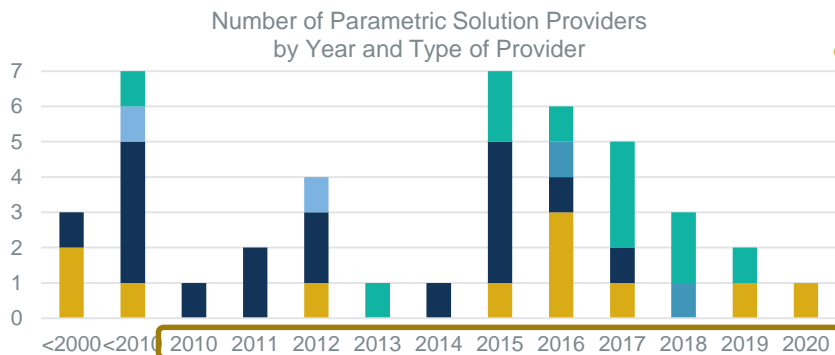


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With big data and technology advancements, MGAs/brokers and analytics agencies are entering the market, making parametric solutions more accessible



- Number of parametric solution providers are increasing over the decades (<2000s: 3, <2010s: 7, <=2020s: 33)
- According to InsTech 2021 parametric outlook, majority of parametric solutions are weather/climate/catastrophe related
- Business model of parametric related MGAs/brokers include B2B2C



Data Source:
Parametric Insurance, 2021 outlook and the companies to watch, InsTech London (2020)

Note:
The list of companies are as noted in the InsTech London parametric report. The six incumbent insurance providers/brokers have been excluded from the list. All six incumbents currently provides parametric solutions: Lloyd's, hannover re, Renaissance Re, Munich Re, AXA, Swiss Re.



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Only a handful offers non-climate related parametric solutions, showing potential for growth within the field



Covers **IT downtime** for Cloud, Web hosting, payment services etc.



Develops and maintains a **reputation index** of companies (e.g. brand, image, ESG)



Risk exchange platform for **uninsurable risk** such as political sanctions



BI for gig economy workers, as well as hurricane, flight delay and pandemic



Agriculture coverage using over 3,000 untraded commodity indexes across 70 countries



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Basis risk

- Risk that payments from parametric insurance do not match the losses incurred by the insured. This is especially a problem with weather insurance.
- Spatial risk: distance between farmer and weather station may be large.
- Design risk:
 - poor relationship between weather and crop yield
 - Crop loss may not be related to the insured weather peril
 - Yields can vary for different crops
- Temporal risk: measurement of index will reflect particular calendar periods and may miss the growth stage of the crop.





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Case Studies



FloodFlash (UK)

How it works

- Trigger: minimum depth of flooding.
- Payout: occurs when a mobile-connected sensor reports trigger is reached.

Target market

- Only flood specific product on the market.
- Attractive where flood cover is (a) excluded, (c) inadequate and (c) more expensive with traditional insurance.

Benefits vs traditional insurance

- Lower expenses because there is no need to pay loss adjusters, claim teams, legal and other costs.
- Traditional insurers have to allocate more capital because of uncertainty over claim amounts, and this leads to higher premiums for insureds.

Risks

- Aggregations
- Underinsurance

Swiss Re Soil Moisture (Global)

Insurance Challenge

- Difficult to **objectively access** losses
- No **scalable** solutions
- Lack of **trust** of farmers and governments

The Solution

- Satellite based **Soil Moisture** index
- Incorporation with **VanderSat**
- Global data
 - 100m x 100m
 - Real time
 - Daily

Impact

- Transparent, Scalable product
- **Reduced** operational **costs**
- **Fully digital** insurance processes



Qomplx: (UK)

Covers

- Cyber data breach
- Cyber service outage
- Terrorism disruption

Target market

- SME

Benefits vs traditional insurance

- Small premium: the average cost is estimated to be 5-10% of current insurance spend.
- Clear triggers: simple and objective
- Quick payout: the payout process is faster than traditional cyber insurance as there is no need to determine the amount of actual loss
- Flexible limits: customers can choose their own limits, the range is from 5,000 pounds to 100,000 pounds

Risks


- Aggregations
- Underinsurance

Skyline Partners (Global)

Insurance Challenge

- Lack of **knowledge & transparency** in parametric solutions
- Physical data sources prone to **manipulation** or may be unavailable (e.g. weather stations)

The Solution

- **Risk visualization** via  technology
- Uses **public, non-physical** data sources
 - Satellite (e.g. NASA, NOAA)
 - Real-time, hourly
 - > 40yrs satellite & >17 yrs weather data
 - Millions of pixels & billions of data points

Impact

- Fast, stable and highly **scalable** product
- **Reduced** operational and underwriting **costs**
- **Consistency** between risk expectations vs experience
 - Risk monitoring & claims payout → same data source



SwissRe Travel (Global)

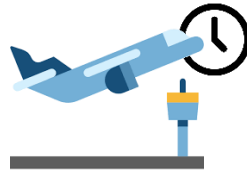
The challenge

- Conventional products cover flight **delays ~6hrs** (*unlikely to occur*)
- Connection delays more likely to happen due to **virtual interlining** (e.g. skyscanner)

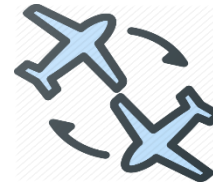
The parametric solution

Payment trigger

Trigger event
(and / or)



Departure delays



Connection delays



Arrival delays



Cancellations

Mins for
trigger

30mins to 180mins

Analytics for product design

- Priced using weighted **correlating factors** spreading over 5-10yrs, e.g.
 - Operating carriers / Airports
 - Time of flight / Day of the month
 - Weather conditions
- Priced **daily**
- **Negatively impacted** by Covid-19 where all flights were cancelled **but** price margins were not increased



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NTUC Income (Singapore)

How it works

- Protection against rain related surge on ride hailing apps
- Trigger: Rainfall over a certain level when the user decides to hail a rideshare

Target market

- Individual focussed product: low premiums, clearly defined triggers

Benefits vs traditional insurance

- Low ticket size: traditional loss adjustment out of question
- Clear triggers, easy claims process (forward email receipt from ride hailing platform)
- Public, local rain data from Singapore government API enables transparency
- Dynamically priced based on weather forecast

Risks

- Aggregations



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The Parametric Landscape

Where do actuaries fit in?



Parametric Insurance: Actuarial Context

- Pricing and Product Development:
 - Parametric in theory easier to model than indemnity products – if the index can be valued historically then historical loss cost is known
 - Actuarially appealing – several of the use case startups we looked at have actuaries as founders
 - Technical complexity usually lies in the index construction
 - Index often relies on ‘big data’ sources and new technology – so points to both collaboration with other disciplines and upskilling in related data science / machine learning techniques
- Reserving & Capital
 - Becomes far less relevant: quicker claims settlement, zero uncertainty on loss amount
 - Less uncertainty in severity, potentially more accumulation
- Wider Fields: Strategy, Technology, Management..





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The Parametric Landscape

What is the future of parametric insurance?



Benefits of technology: Internet of Things (IoT)

- 20 billion IoT devices that capture data
- Blink: platform that covers IoT-supported domestic appliances. A fault triggers an automatic alert to the insurer, who will then issues a cash payout or arrange a service call.
- Parsyl: Smart sensors determine if marine cargo has been spoiled by temperature and informs customers of temperature breaches. Payout in 72 hours if trigger is breached.
- Take up of IoT has been relatively slow so far.

Blink Parametric
A Blink Innovation Platform



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Benefits of technology: Smart contracts

- These are contracts that are automated using code
 - ideal for parametric insurance where automation and speed of payment are key.
- Costs are reduced which lowers premiums for insureds.
- Axa launched a flight cancellation product trial in 2017, but was withdrawn.
- Arbol is an Ethereum platform that uses weather immunity tokens (WIT):
 - A farmer and investor both pay some amount of Ethereum into a smart contract and receive a WIT in exchange.
 - At the end of the policy period, the terms of the WIT e.g. rainfall are evaluated using a weather API query.
 - If the trigger was breached, the farmer receives a payout otherwise the investor keeps the farmer's contribution to the WIT.



Areas most likely to be affected

- Micro-insurance: parametric cover is well-suited for third-world countries where the entire transaction from premiums to claims payments needs to be achieved at low cost.
- SMEs: make up 95% of companies in the UK and underinsurance has been highlighted as a major concern by the UK regulator. Simple parametric products can fill the gap.
- Personal insurance: speed and ease of payment has led to successes in covering natural catastrophes.



QOMPLX:

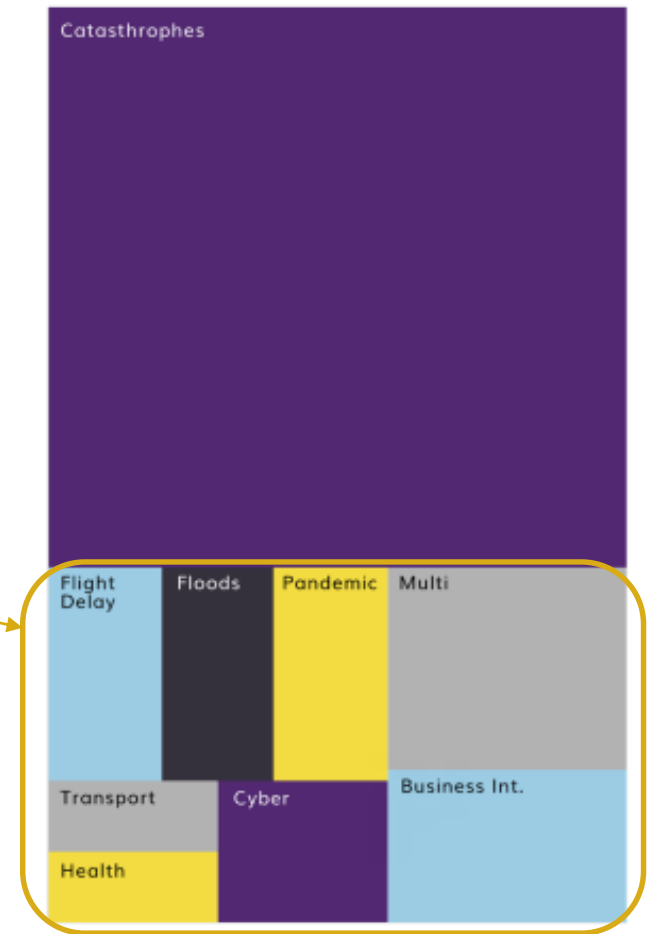
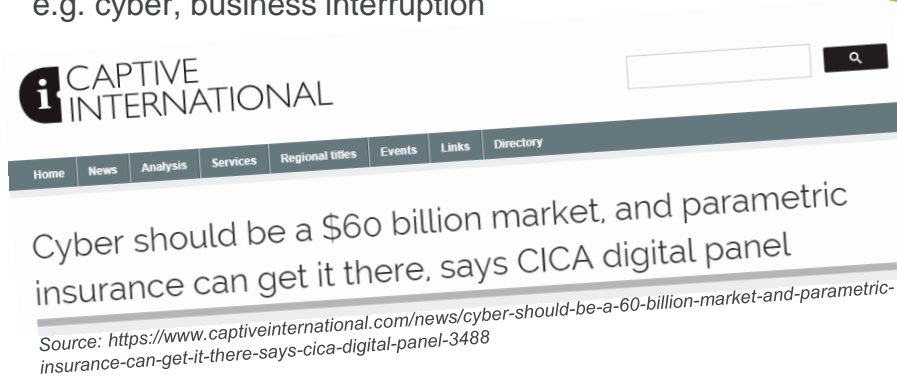
Jumpstart



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Expansion into other lines of business

- Technology advances promotes adoption of parametric insurance
- Consider introducing parametric capabilities to smaller claims
- Increased accuracy and modelling capability of catastrophe/weather related disasters
- Continued expansion into **other lines** of business e.g. cyber, business interruption



Insurance Category (by number of providers)
Instech London Parametric Insurance: 2021 outlook and the companies to watch

Final Remarks

- Parametric insurance can close the protection gap that exists with traditional indemnity insurance by:
 - using technology e.g. IoT will lead to more data available to build parametric indices
 - expanding outside of the traditional natural catastrophe area e.g. cyber, flight cancellation and ride hail-sharing
 - providing a better solution than traditional indemnity insurance e.g. pandemic cover which is being developed by several companies
- The actuarial profession will need to adapt
 - Actuaries have been involved in dealing with insurtechs as most have capacity provided by insurers and reinsurers.
 - Reducing basis risk requires good quality models which actuaries can help to build
 - Data scientists have been heavily involved but this is an opportunity for actuaries to develop their data science skills



Questions

Comments

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