Can financial innovations be structured to address climate risk of smallholder farmers?

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More than 30 years of varied experience focused on discovery of new approaches to agricultural insurance

- Academia (University of Kentucky)
  - Professor of Agricultural Economics since 1981
- Government (US Crop Insurance)
  - Director of Research for Congressional Commission 1989
- Consultant (US Crop Insurance Industry)
  - Modeled Standard Reinsurance Agreement 1995-2000
- Development Community (GlobalAgRisk)
  - Founded in 2001
- Entrepreneurial Efforts (Global Parametrics)
  - Support from UK (DFID) and Germany (KfW)

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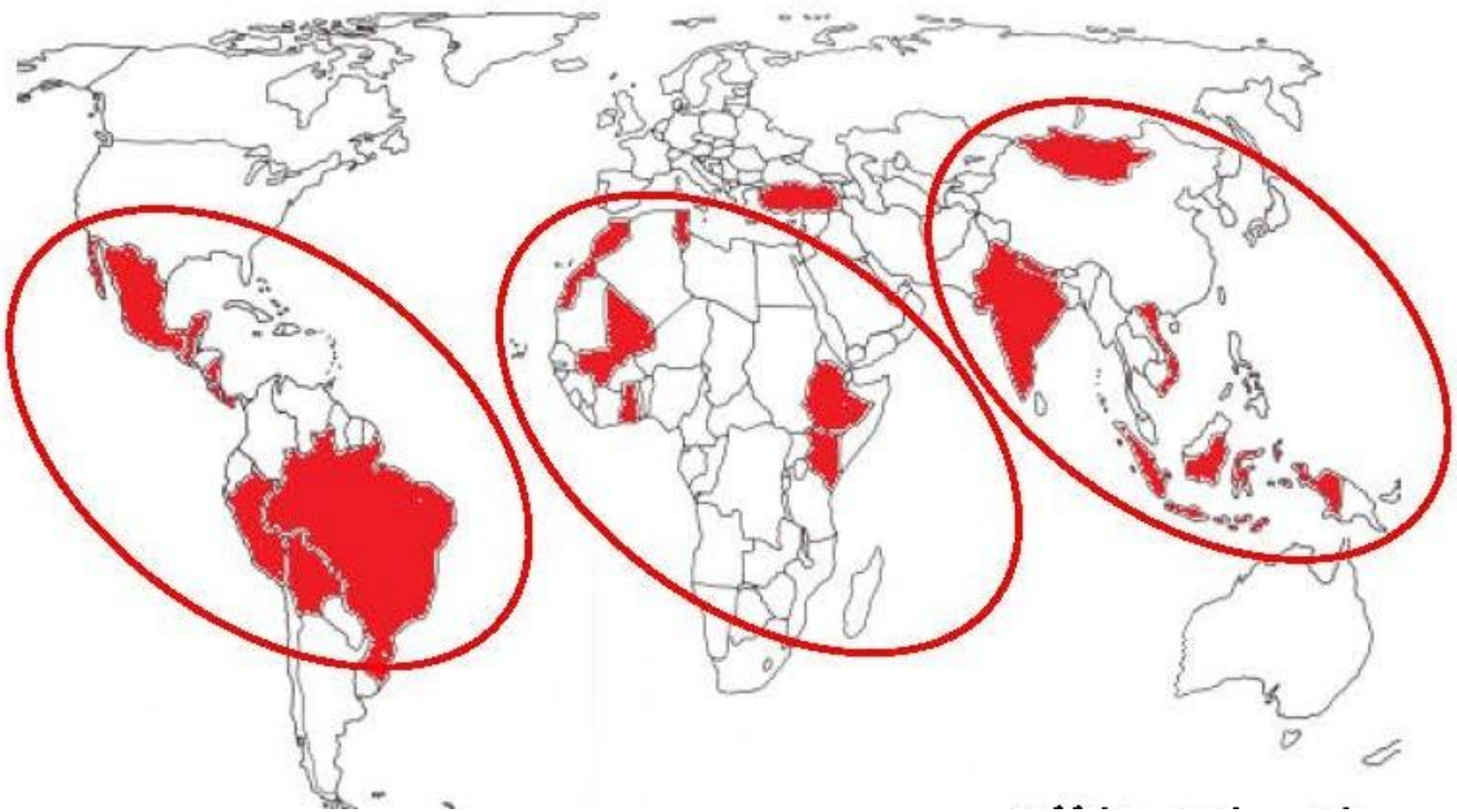
GlobalAgRisk a research and development firm
Major efforts in Peru, Mongolia, Vietnam, and Indonesia



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Challenges for Agricultural Insurance for Smallholders in Low and Middle Income Countries

- Classic insurance problems
  - Moral hazard
  - Adverse selection
- Data
- Delivery cost
- Correlated risk must use global reinsurers
- Legal and regulatory
- Limited demand

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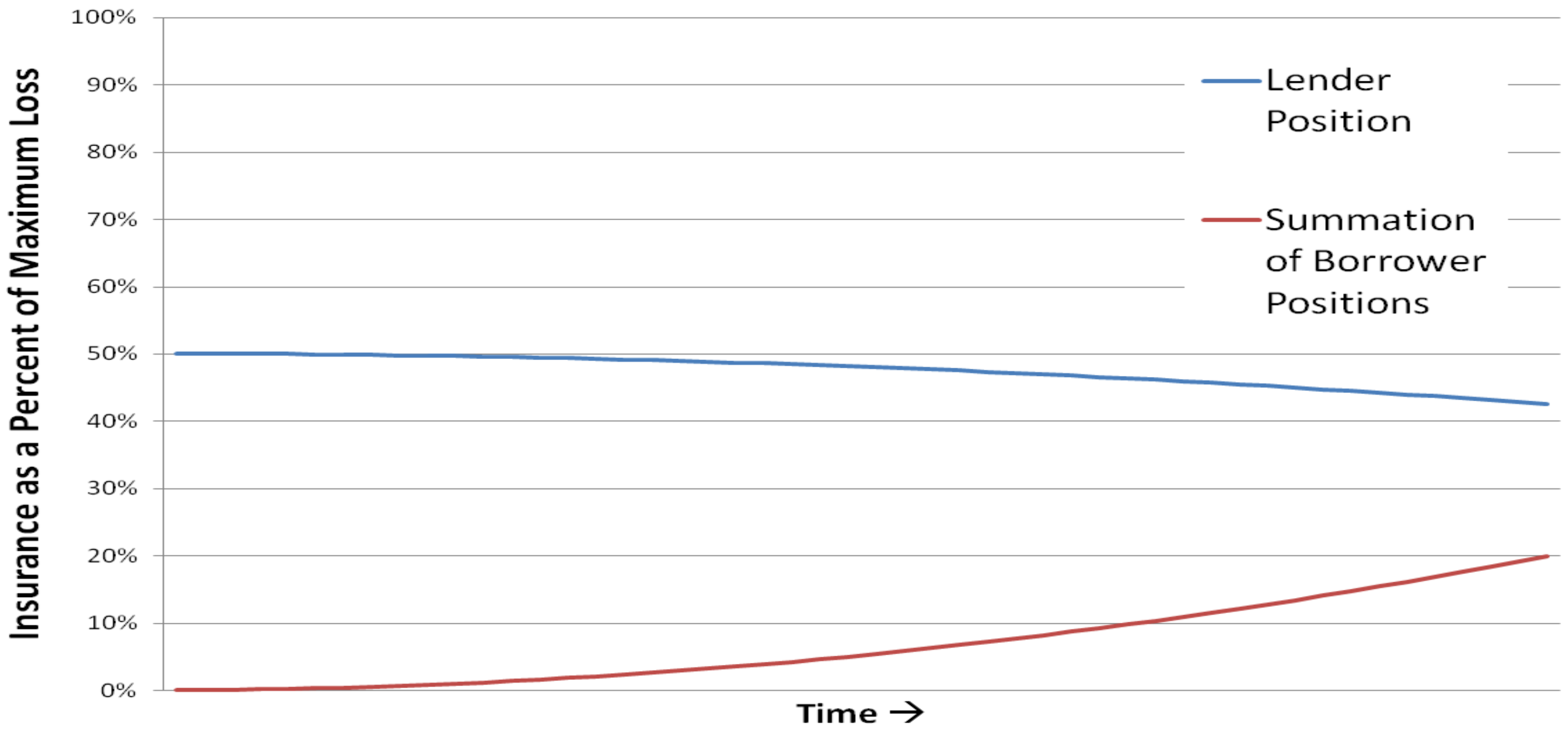
Index Insurance has limited success for smallholder farmers

- Too much basis risk
- Limited demand and limited scale up
- Few success stories
  - Syngenta in Kenya
  - Gov't of Mongolia & World Bank (livestock)
- Take away learnings:
  - Until more progress is made in addressing key challenges, having smallholder farmers purchase insurance may not the right answer.

Protecting firms serving smallholders may work better and lead to 'downscaling' and growth of insurance



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Disasters create problems with access to finance on an ex ante basis and credit contraction post hoc

- Dr. Benjamin Collier – Wharton U of Penn

Study using MIX Market Data (MSME Lenders) + EMDAT

Disasters reduce portfolio quality

- 1 percent increase in population affected by disasters yields a 1.1 percent decline in access to credit in year after
- Liquidity problems spillover to one year after
- Capital problems spillover to two years after
- Demand for credit increases and supply is reduced
    - Increased cost and volatility of capital

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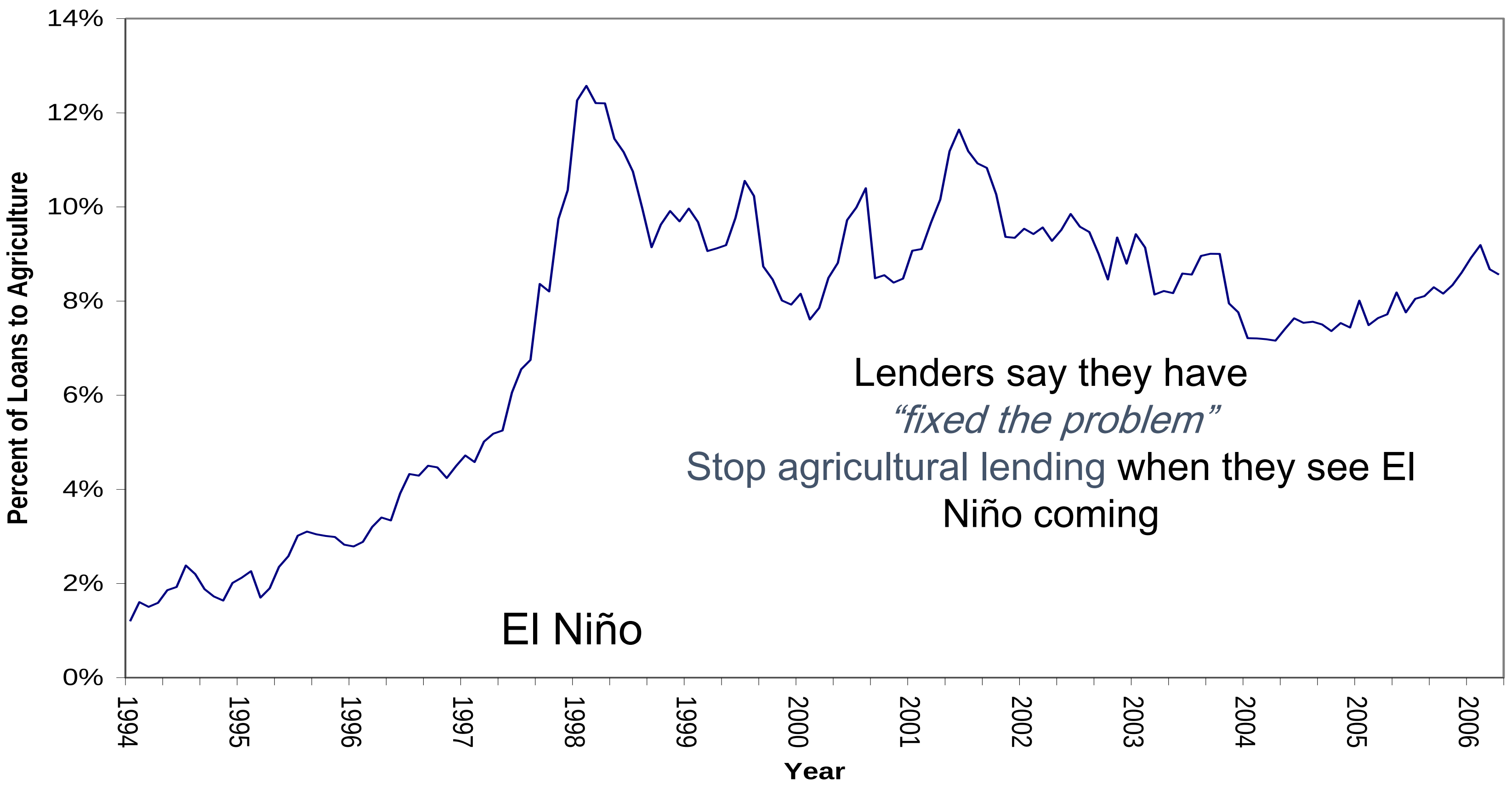
Pattern of Agricultural Lending in Piura, Peru 1994–2006



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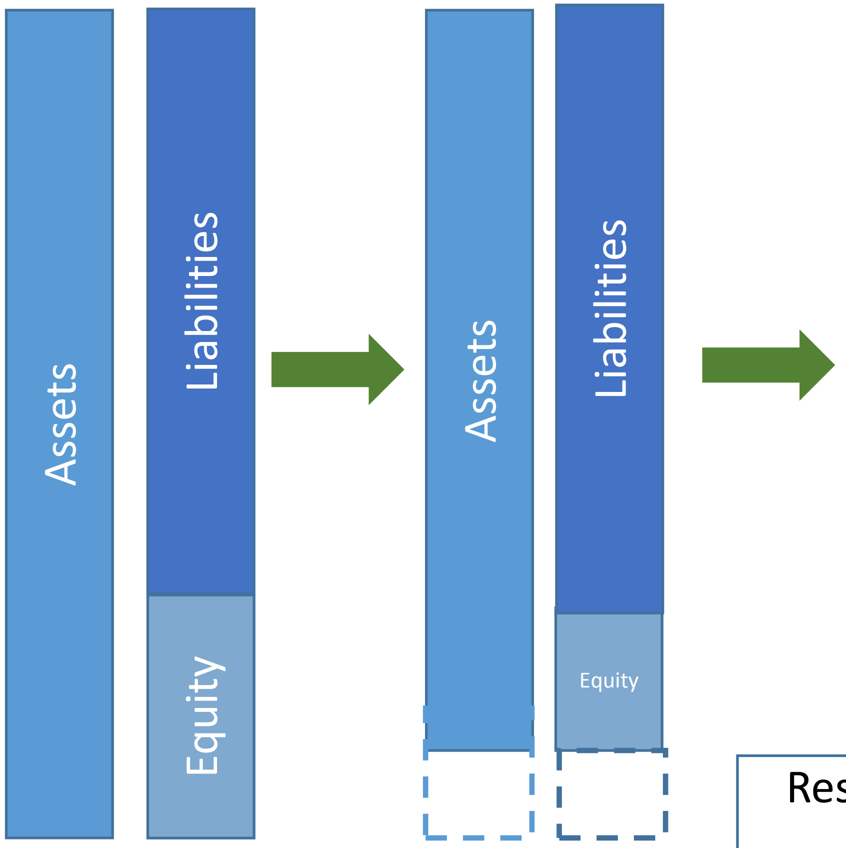
FI Balance Sheet Pre-Disaster

FI Balance Sheet Post-Disaster



REDUCED LENDING TO LOCAL MSMEs

- Lower equity base leads to reductions in lending
- Lower lending reduces FI's profits and ability to lend more in the future
- Post-disaster, when enterprises most need capital lending stops
- FI may reserve more capital pre-disaster, but this cuts lending capacity and slows growth

Restructured and bad loans erode equity base

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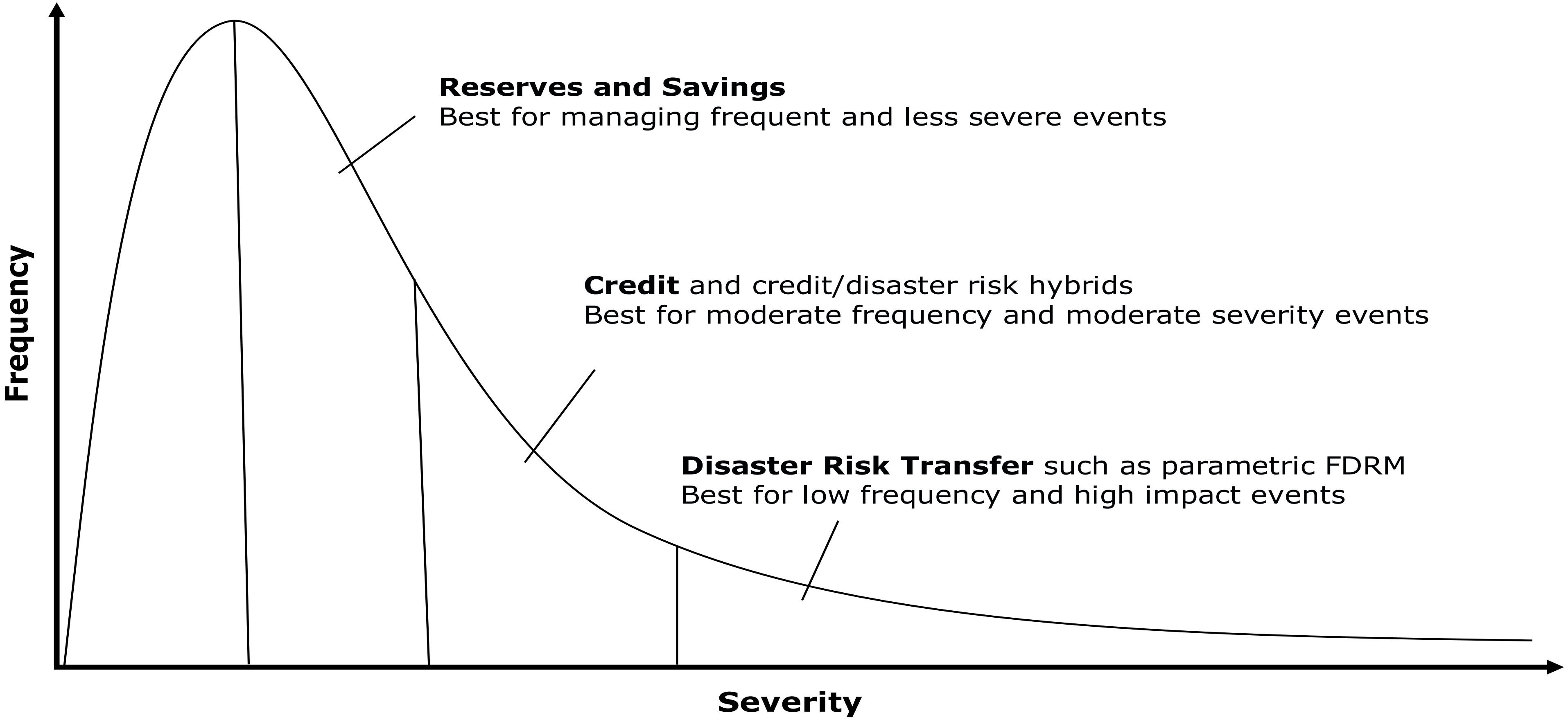
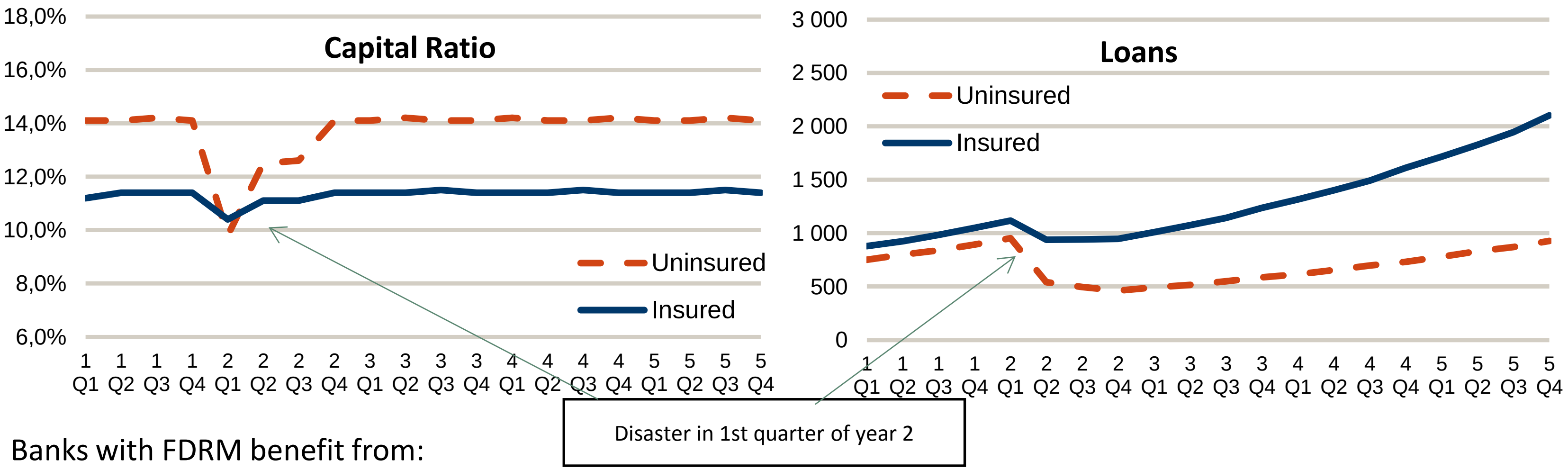
Financial Disaster Risk Management (FDRM)
Different financial innovations fit depending on the risk



Reducing consequences of catastrophic natural disasters has potential to increase lending from financial institutions, which can spur significant economic growth and poverty alleviation

Modeled Impact of Disaster on Banks w/ & w/o FDRM[1]



- Banks with FDRM benefit from:
  - More stable capital base in case of disaster
  - Increased ability to lend (with or without disaster) due to lower capital ratios
  - Higher net income due to greater lending activity, which promotes additional capacity to lend in future
  - Greater lending capacity (compared to banks without FDRM) after disaster when credit is most needed
- General economic benefit --- great financial inclusion, lower cost and volatility of interest rates, lower poverty

1. Source: GlobalAgRisk proprietary models

Challenges Remain

- Governance structure of firms may be incompatible with taking a longer term view of financial disaster risk management
- All decision makers have trouble processing infrequent and severe risk events (cognitive failure)
- Robust in-country legal and regulatory environment
- Access to reinsurance for highly correlated risk in low and middle income countries

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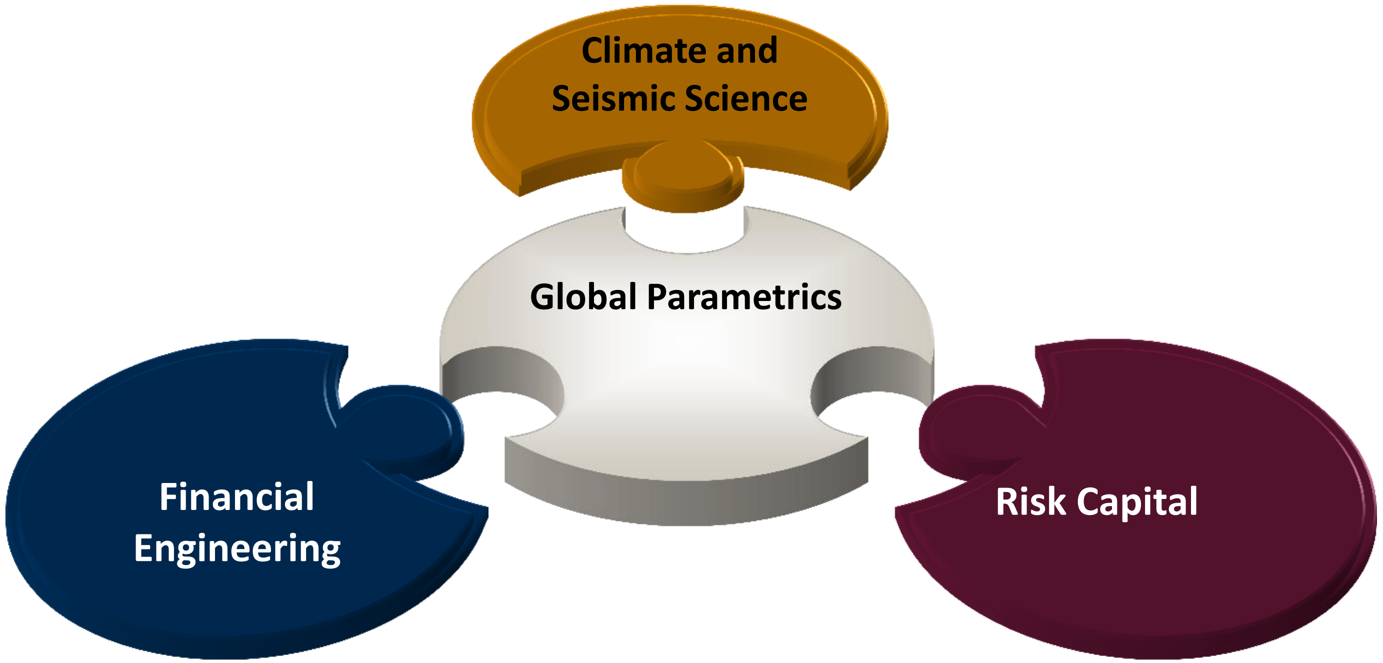
Global Parametrics

An innovative, socially-oriented venture (under development)



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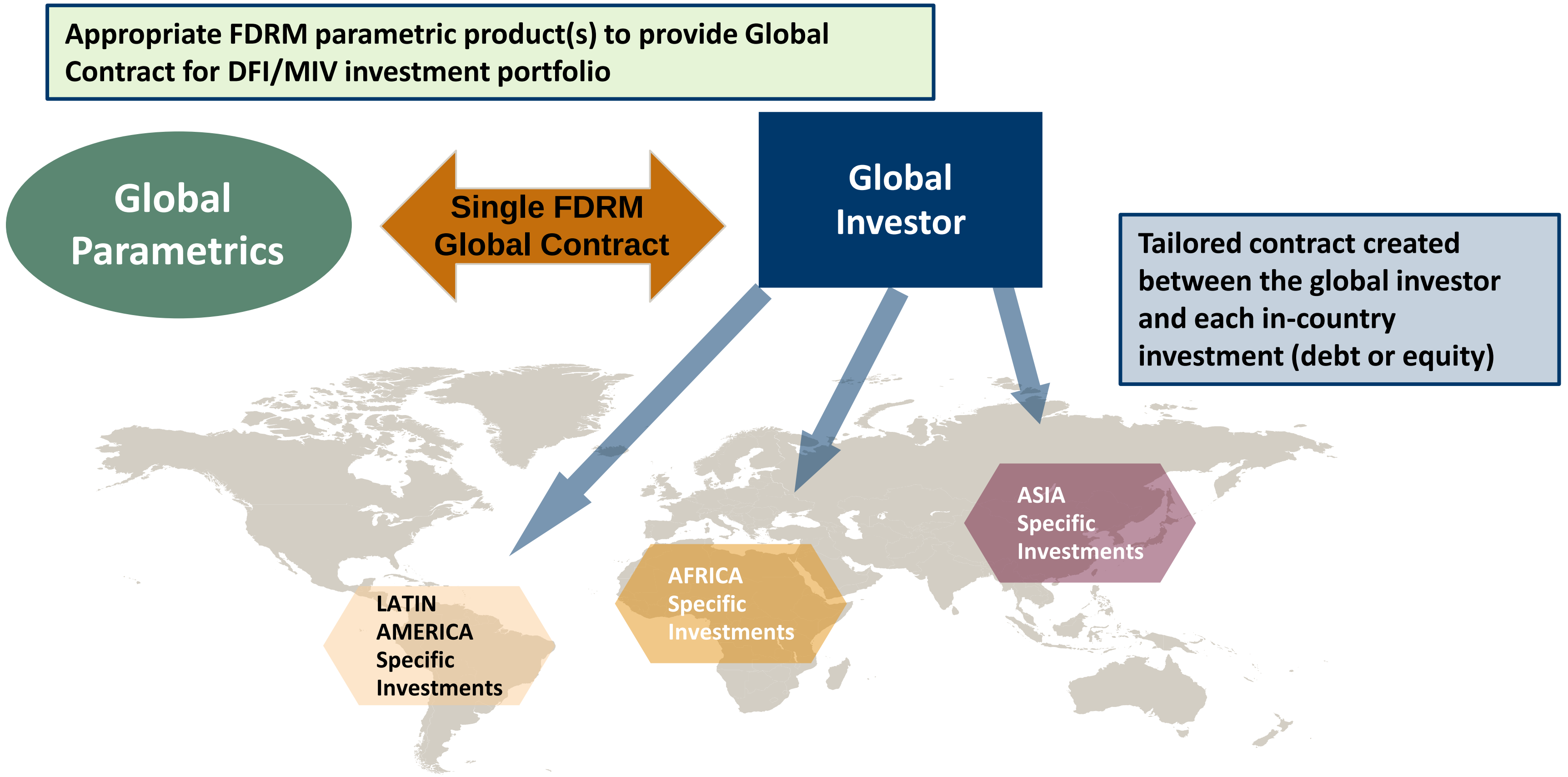
Global Parametrics FDRM Global Contract Structure



Questions?

www.globalagrisk.com