DROUGHT TOOL PROTOTYPE DEVELOPMENT
And the impact on corporate loan portfolios

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Background and Objectives

Most industries reliant upon water in some form – systemic risk (?)

Corporations ability to service loans therefore also dependant
Gaps in financial institutions’ (FI) analytical capabilities

Currently, FI’s quantification of environmental risk is limited

Difficult to translate environmental impact into loss

Location and certain financial data not utilised in analysis

Potentially systemic nature important for whole portfolio

Need to quantify portfolio’s exposure and enable differentiation
Interconnectivity

Direct water availability – key driver

Power / electricity – dependant upon generation method

Regional supply and demand – materials and labour

International macroeconomic impact
Analysing the drought
Analysing the drought
Approaching the loan default problem

How is the company directly affected?

How is the company indirectly affected?

How does that impact revenue and cost of goods sold?

How does that change likelihood of default of specific loan?

What would be the cost to the FI of that default?
Traditional ‘cat’ model

1. Stochastic events
2. Peril hazard
3. Vulnerability
4. Ground-up impact
5. Financial loss
6. Policy details
7. Insurance portfolio loss
8. Exposure data
Loan default approach

Scenario events → Drought hazard → Direct vulnerability → Direct / indirect impact → Loan default probability → Loan portfolio loss

Indirect vulnerability

Company financial data

Company location data

Macro economic impact

Macro economic model

Direct vulnerability

Loan default probability

Company financial data
High level example

Food and beverage manufacturing

Production facilities in:
- Chicago
- Indianapolis
- San Francisco
- $75MM loan
- $100MM rev.
- $30MM costs

Severe five-year drought in West and Central United States
Reduced rainfall in certain regions by 90%

Reduced water supply in Chicago restricts bottling plant operations
Power supply from hydro electric supply reduced by 80%, forcing other sources to be used
Reduced availability of raw food products from California

Revenue decreases by 40% to $60MM due to decreases in productivity
Water costs increase by 60%
Power costs increase by 40%
Costs increase by 30% to 40MM

In 3rd year of drought, company becomes insolvent
Loan default, and loss to FI of $75MM
What are the tool’s limitations?

Limited number of sectors

Limited number of countries

Scenario based - not probabilistic

Based on currently available data which could improve
Value and benefits

Provides FI’s context into potential scale of drought-driven default loss

Build intuition around sectors & regions more / less exposed to drought

Modular in nature – enabling FIs to tailor components to internal view

Provides general framework to develop environmental risk models
QUESTIONS