Pilot Project on Environmental Stress Testing
Putting environmental scenario analysis into practice

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Goals of Pilot Project *Environmental Stress Testing*

Integration of environmental indicators into financial decision-making processes of banks

Develop and test analytical framework and model that allows banks to assess the potential impact of droughts on the performance of their corporate lending portfolio.

- Which loans/companies and sectors are particularly susceptible to drought conditions?
- Appropriate interest rate for a loan given to a company operating in a water stressed area?
- What are potential capital requirements caused by a drought?
Components of the Tool

5 Drought Scenario per country

Drought hazard

Indirect vulnerability

Direct vulnerability

Direct / indirect impact

Company financial data

Loan default probability

Loan portfolio loss

Macro economic impact

Macro economic model

Company location data

Change in Revenues and Expenses
Output: Updated Financial Statement

Updated CR & PD => Expected Losses

Step 1

Step 2

Step 3 & 4
Results in China, Mexico and USA:

- 2,500 companies from 11 different sectors
- 10%-20% downgraded
- SME firms more affected vs. large companies
- Industrial concentration
- Conclusion: Geographical concentration key driver for risks.

- 2 portfolios tested
- 65%-100% downgraded but small probability of default
- Industrial areas responsible for losses
- Biggest losses in oil & gas, food manufacturing
- Conclusion: MEX affected more severely due to geographical layout.

- 2 portfolios tested
- 4 out of 5 scenarios little impact due to high ratings and gov’t support => low default risk
- 60%-100% downgraded, portfolio losses up ten-fold
- Conclusion: Portfolios/industries less vulnerable to droughts.
Results in Brazil

Portfolio 1:
• 60% - 75% of companies downgraded
• Significant drop in revenues & increase in costs with biggest impact Scenario 5
• Expected losses under all scenarios higher compared to non-drought
• No differences between SME and large companies

Portfolio 2:
• 90% of companies downgraded
• Biggest losses in crop production
• Expected losses 4-9 times higher in droughts

Conclusion: Reliance on hydropower and geographical concentration of industries key drivers for the observed results.
Key Findings

(1) Development Process:
- Starting Point
- Standardisation
- Adaptability

(2) Role of Data:
- Precondition
- Availability
- Integration

(3) Geographical Concentration:
- Natural hazard
- Industrial/production areas
- Diversification
Thank you for your kind attention.

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Appendix
Vulnerability Model

Direct vulnerability
- Industry class
- Location
- Relative use of water
- Mitigation measures

Indirect vulnerability rdu
- Water supply
- Power supply

Water dependency

Company data
- Loss of functionality
- Revenue impact
- Increased cost
- Operating cost impact

Sectoral impact
Expected Loss Calculation

We have:

\[ EL_t = DP_t \times exp_t \times LGD_t \]

Given that we will know the exposure, we need to find the default probability and the loss given default.