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Pilot Project on Environmental Stress Testing

Putting environmental scenario analysis into practice

Emerging Markets Dialogue on Finance, Makaio Witte
Johannesburg, 22/03/2018



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Folsom Lake,
California, 2004



Folsom Lake,
California, 2014



Goals of Pilot Project *Environmental Stress Testing*

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



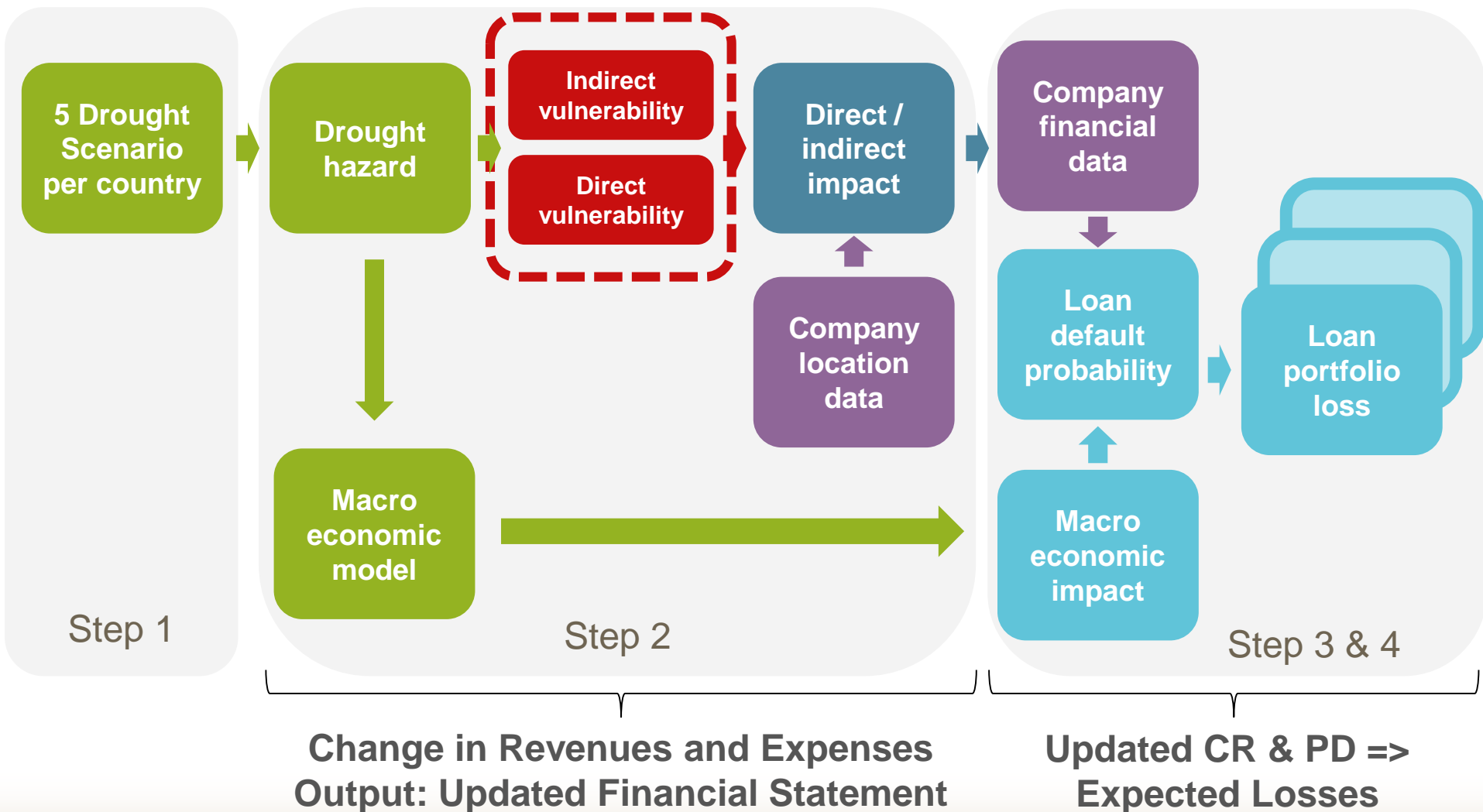
Develop and test analytical framework and model that allows banks to assess the potential impact of droughts on the performance of their corporate lending portfolio.



- 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





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Partner Structure

Implementation Partners



Expert Council



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Bloomberg



Partner Banks



UBS



ICBC





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.



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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



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Thank you for your kind attention.

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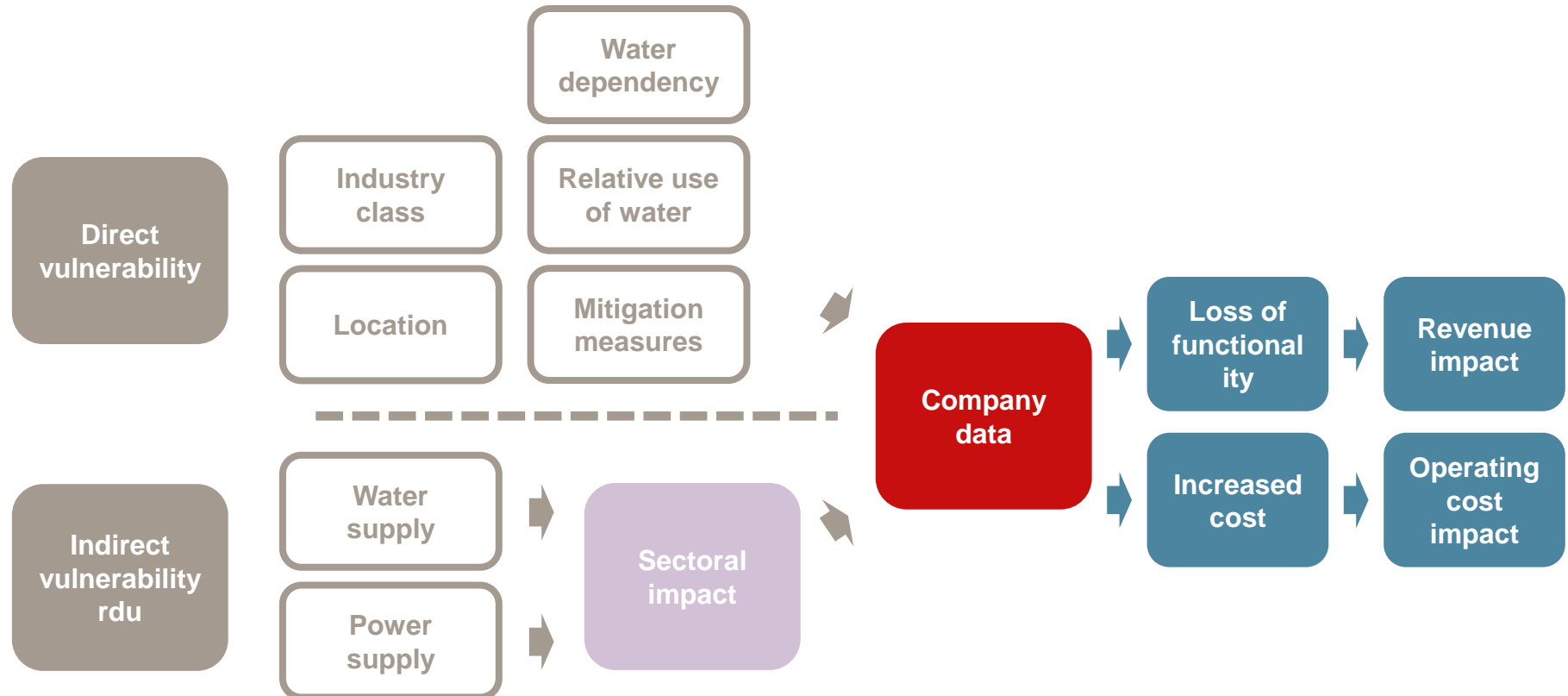
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Appendix

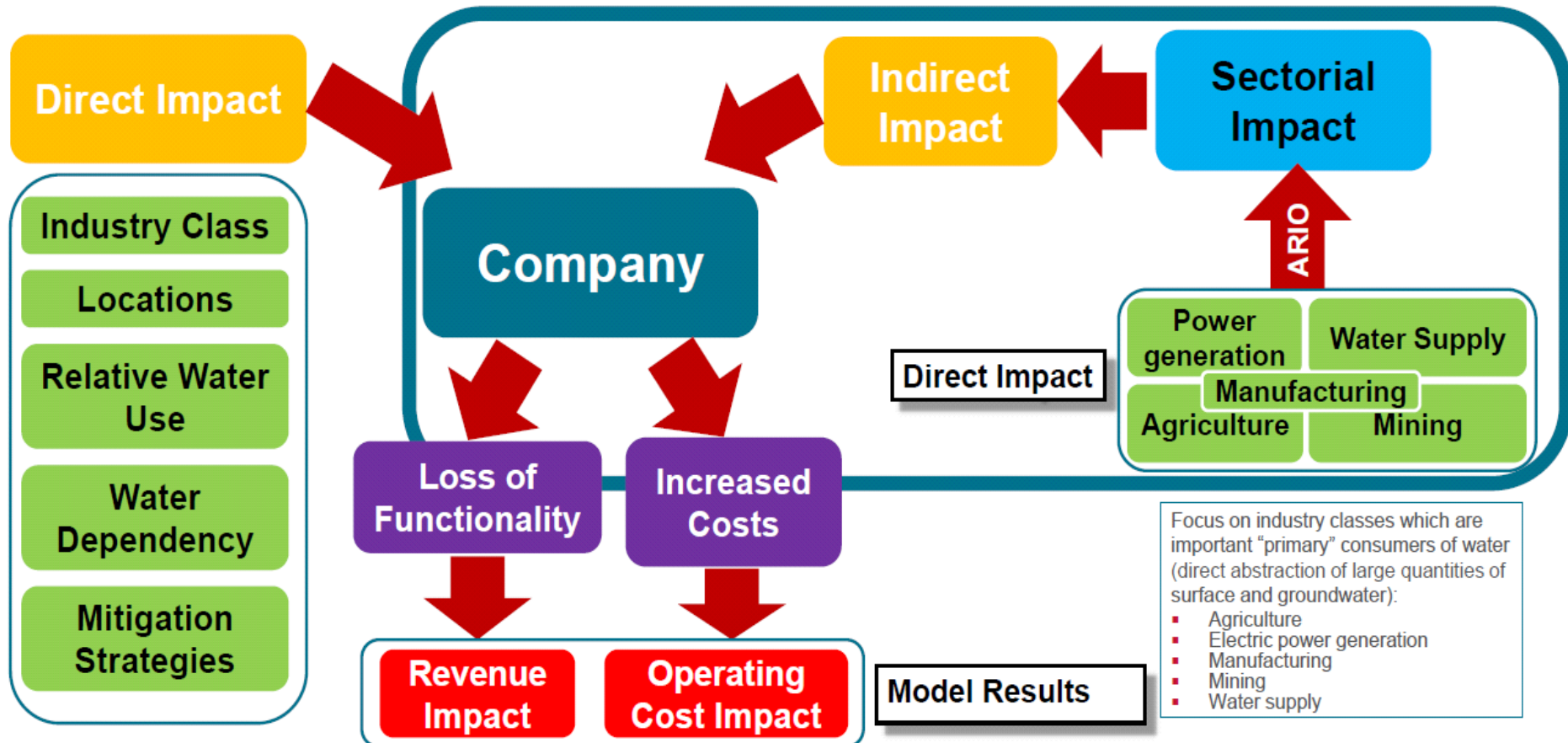


Vulnerability Model





DROUGHT IMPACT MODELLING – HIGH-LEVEL FRAMEWORK





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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.

