



Bundesministerium für
wirtschaftliche Zusammenarbeit
und Entwicklung



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Financial sector leadership
on natural capital

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Pilot Project on Environmental Stress Testing

Putting environmental scenario analysis into practice

Emerging Markets Dialogue on Finance, Yannick Motz
Mexico City, 10/04/2018



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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?



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Partner Structure

Implementation Partners



Expert Council



中央财经大学图书馆
Central University of Finance and Economics Library



Bloomberg



Partner Banks



UBS

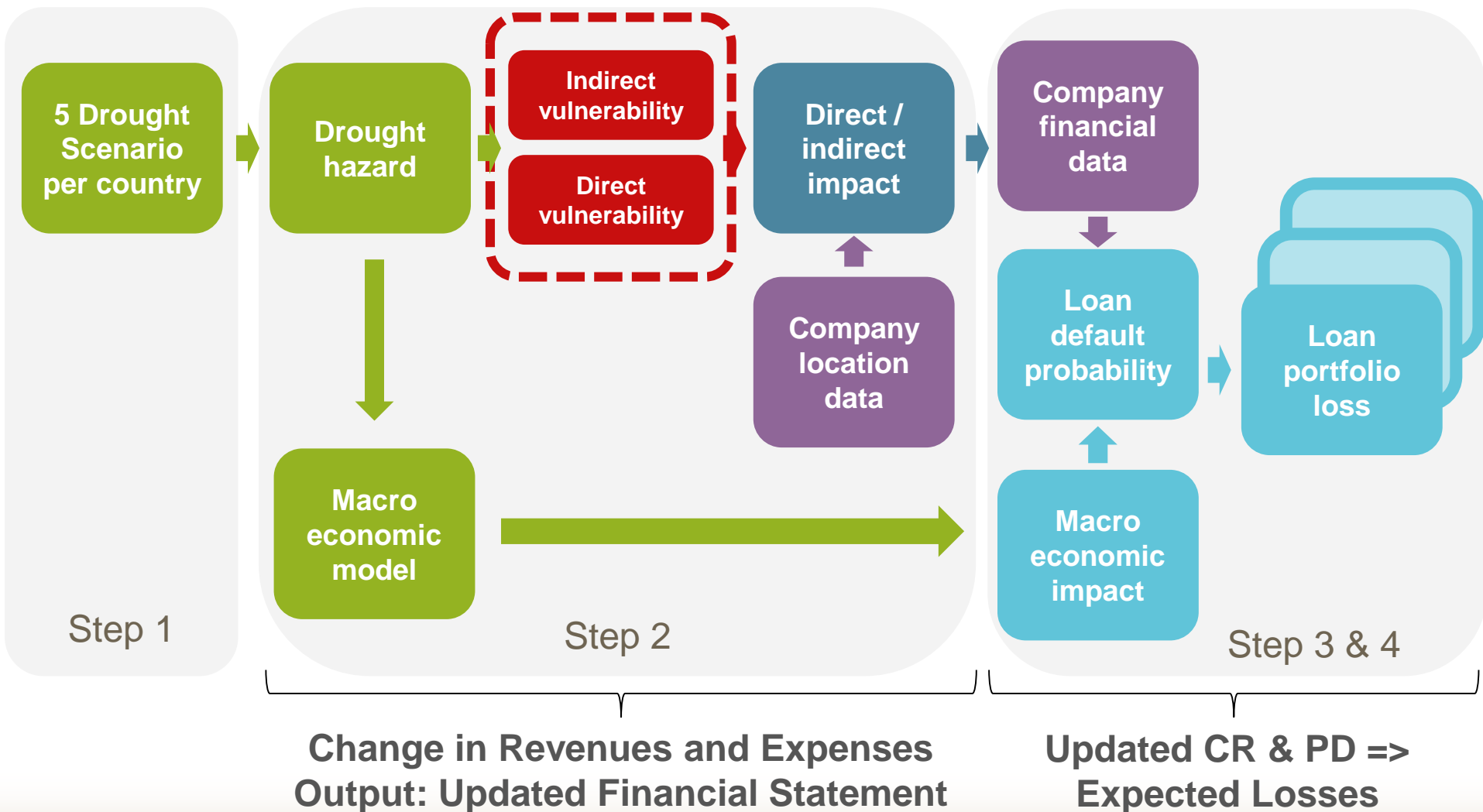


ICBC





Components of the Tool





Results in China, Brazil and USA



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



- 2 portfolios tested
- 60-90% of companies downgraded
- Significant impact: Expected losses 4-9 times higher in droughts
- Biggest losses in crop production
- Conclusion: Reliance on hydropower and geographical concentration



- 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 (but from low baseline default rate)
- Conclusion: Portfolios less vulnerable to droughts



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Results in Mexico

- 2 portfolios tested
- Portfolio 1:
 - 90-100% downgraded, but small increases in probability of default
 - Biggest losses in oil & gas, food manufacturing
- Portfolio 2
 - 65-90% of companies downgraded
 - Portfolio losses increased up to 150%
 - Mexican Gulf most affected area

Mexico affected more seriously by droughts due to its geographical layout.



Key take-aways

(1) Development Process:

- Starting Point
- Standardisation
- Adaptability

(2) Role of Data:

- Precondition
- Availability
- Integration

(3) Geographical Concentration:

- Natural hazard
- Industrial/production areas
- Diversification

Outlook

Framework improved financial institutions' analytical capacity

Roll out: Webinars on Environmental Stress Testing envisaged

Further development of the framework for additional hazards, financial institutions and countries



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Thank you for your kind attention.

www.emergingmarketsdialogue.org

Contact:

Yannick.motz@giz.de



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Appendix



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The five drought scenarios

Scenario 1

The most severe, this drought might be expected once every 200 years, lasting for five years.

Scenario 2

This also lasts five years, but is less severe and classed as a once-in-100-years event.

Scenario 3

A five-year drought that might be expected once every 50 years.

Scenario 4

This is also a once-in-200-years event, but lasting for two years.

Scenario 5

A once-in-100-years event, with a duration of two years.



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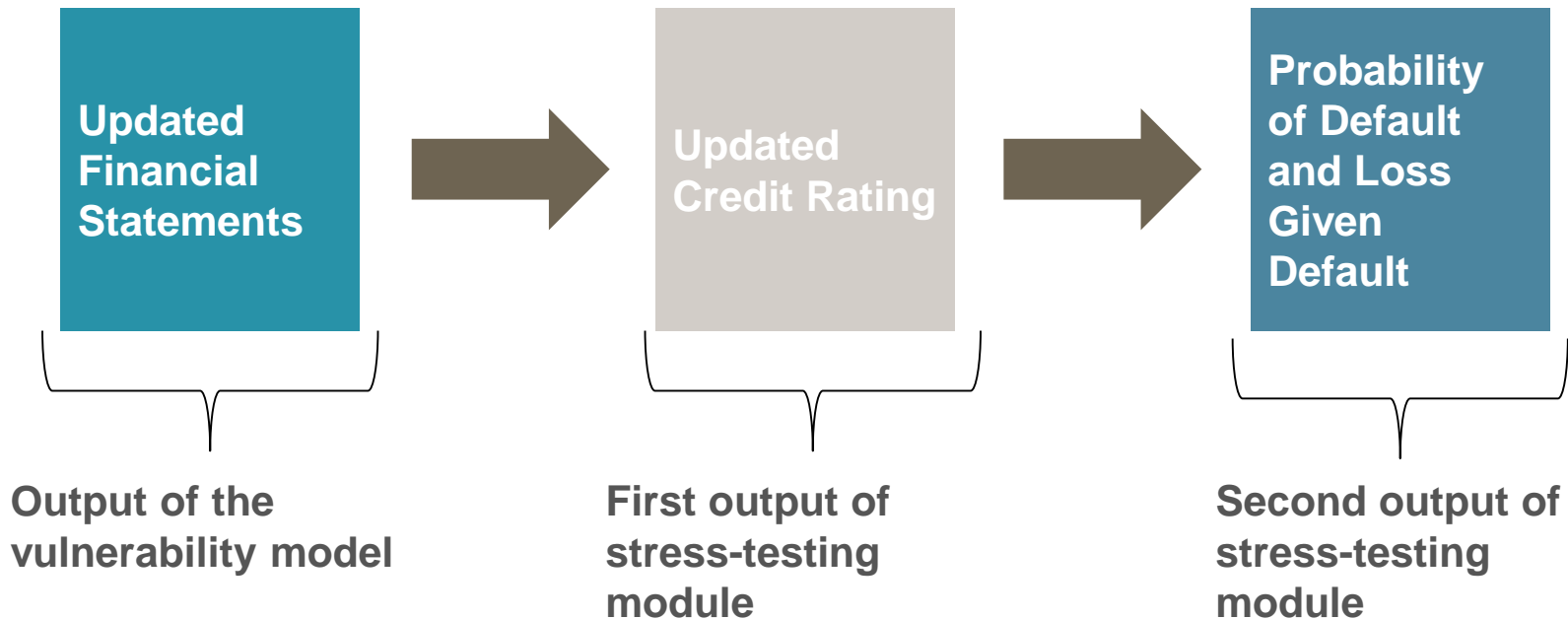


Expected Loss Calculation

We have:

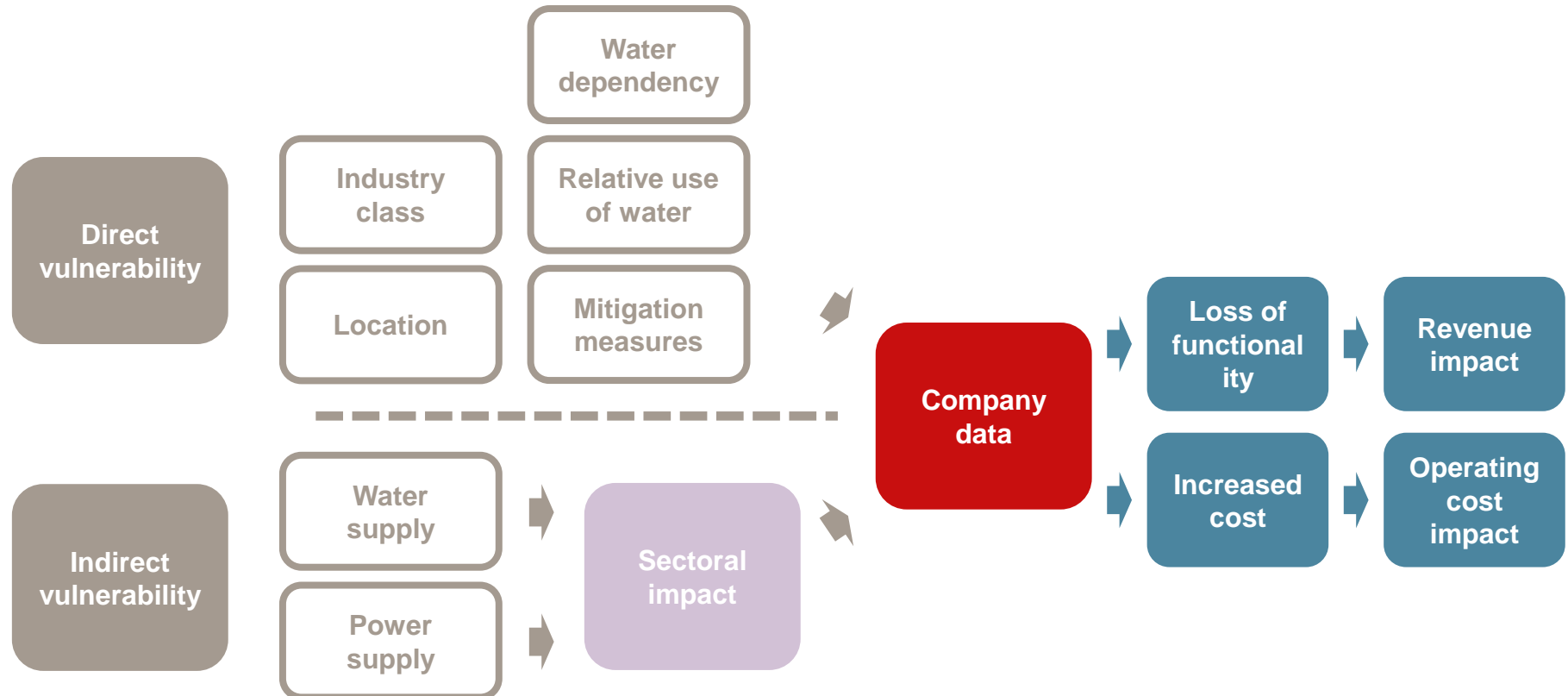
$$EL_t = DP_t \times exp_t \times LGD_t$$

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





Vulnerability Model





DROUGHT IMPACT MODELLING – HIGH-LEVEL FRAMEWORK

