



Quantifying and Integrating Natural Capital Risks

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Outline

- Difference to ESG Integration – Additional Value from Natural Capital approach?
- Environmental Economics – Methods to quantify Environmental Risks
- Data availability and Transparency
- Integration of Natural Capital Risks in Credit Risk Assessment and Valuation
- Initiatives to Develop Methodologies/Tools to Integrate Natural Capital Risks



Difference to ESG Integration

Additional Value from Natural Capital Approach

- **PRI Guidance on ESG integration in bonds (2014):** Focus on contribution of ESG factors to financial downside – significant event risks and systemic risks that can affect issuer creditworthiness.
- Corporate bonds subject to ‘event risk’, which can show up as regulatory, litigation or reputational liability to the company.
- ESG integration should be considered an important aspect of any fixed income investing (PRI, 2014)
- The materiality of different ESG factors depends on the sector the issuer operates in.
- Investors either determine their own ESG indicators and scores for each issuer or source information from external research providers.

ENVIRONMENTAL
Environmental
Climate change
Biodiversity
Energy resources and management
Biocapacity and ecosystem quality
Air pollution
Water scarcity and pollution

Source: PRI Fixed Income Working Group, 2014

Difference to ESG Integration

Additional Value from Natural Capital Approach

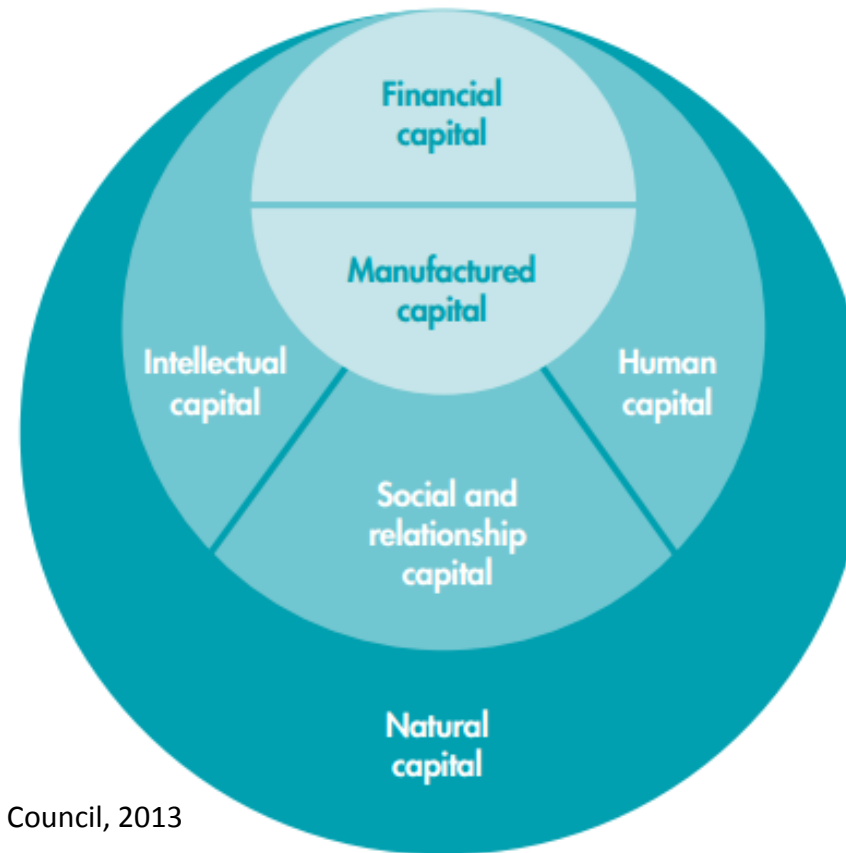
Case study: RobecoSAM credit team integrates ESG factors

- Taking financially material sustainable issues into account improves clients' risk-return profiles.
- Aims to exploit market inefficiencies based on bottom-up and top-down research – analysts have deep sector knowledge.
- Five variables to assess cash generating capacity of issuers and quality of cash flows: Business position, corporate strategy, financial profile, structure and ESG.
- Factors often intertwined to derive fundamental score for company outlook.
- Prime goal of integrating ESG factors into credit analysis is to strengthen ability to assess primarily downside risk of its credit investments. E.g. USD40 billion costs for BP related to the Gulf of Mexico oil spill.
- Using sustainability information in credit analysis to avoid losers in credit portfolios.

Difference to ESG Integration

Additional Value from Natural Capital Approach

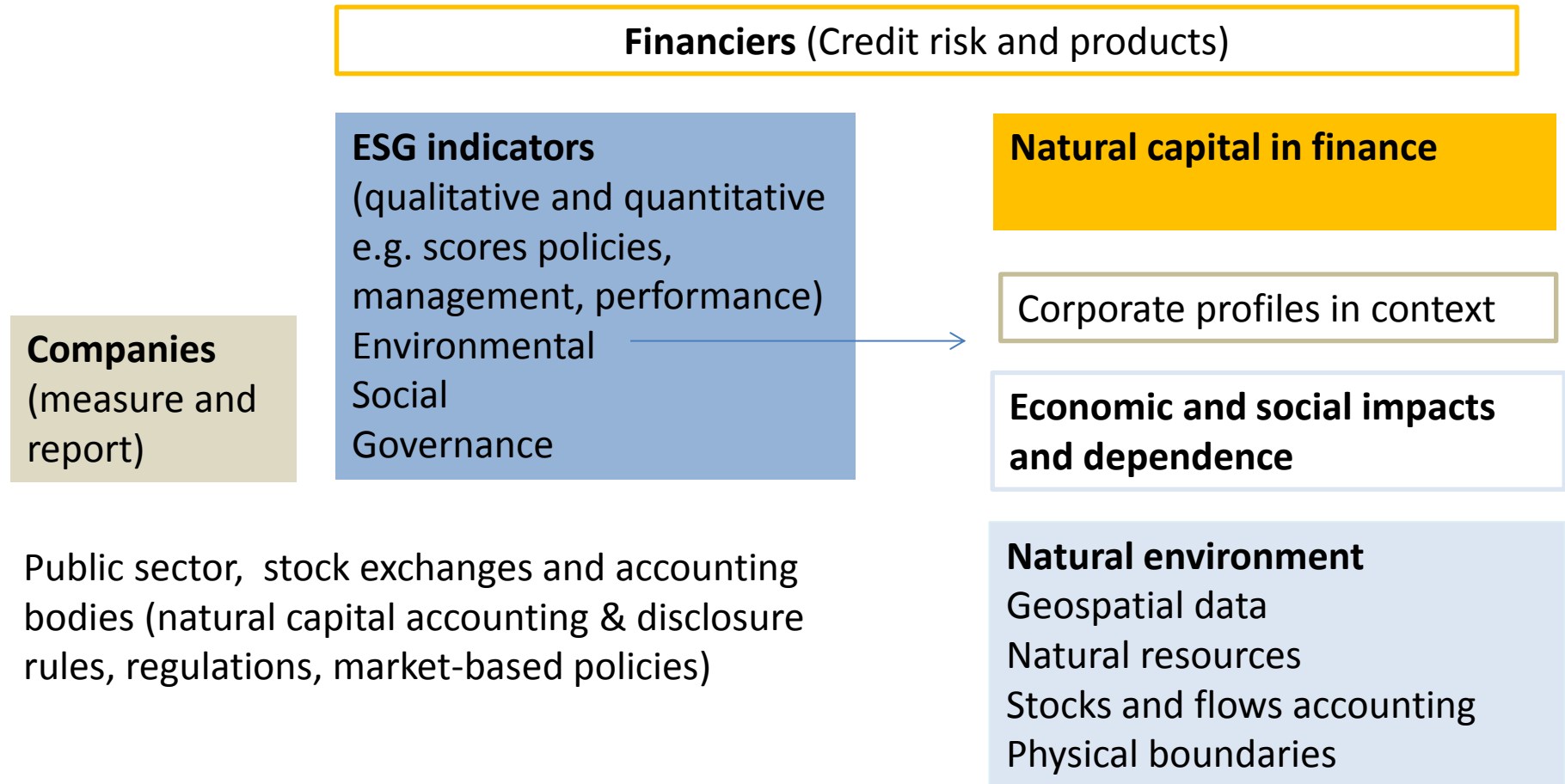
- Survey of 1,200 CEOs globally found one-third perceived biodiversity loss as a risk to their business ([TEEB, 2012](#))
- Survey by [Schroders, 2013](#) revealed shortcomings in economic modelling tools and readiness to incorporate natural capital.
- “Analysing, isolating and quantifying the contribution of natural capital to economic activity has been difficult, mainly due to limited data and lack of consistent methodologies.” ([HSBC](#))
- Need to quantify indirect risks from natural resource constraints and pollution issues embedded in portfolios.
- Step up information and analytics for more systematic and structured approach to risks and opportunities.



Source: International Integrated Reporting Council, 2013

Difference to ESG Integration

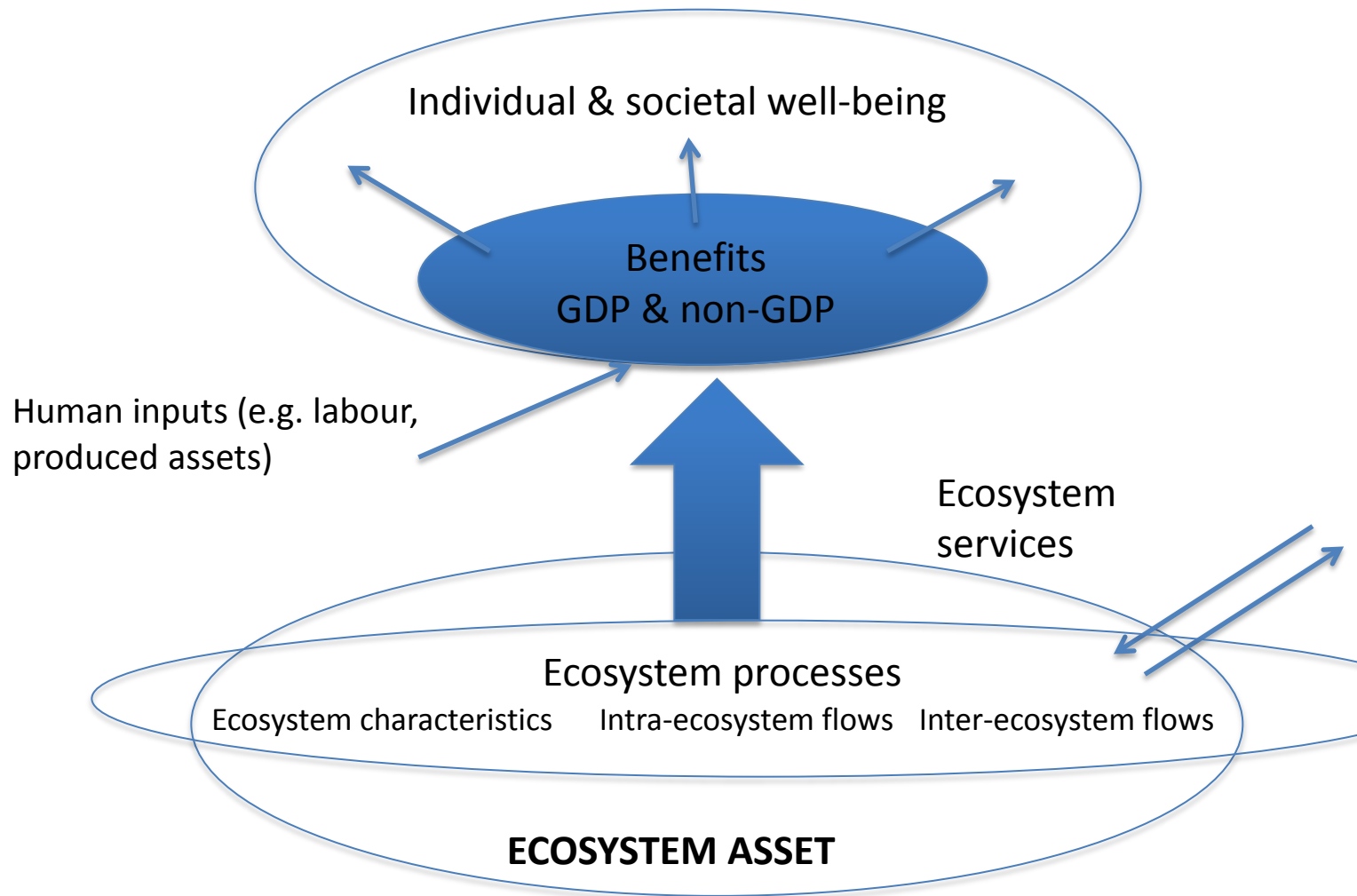
Additional Value from Natural Capital Approach



Environmental Economics

National

- Physical flow accounting (Supply & Use)
- Energy, water, emissions, waste, natural resource, changes in land use



Environmental economics

Valuations of water

- UN SEEA Water: Use marginal value – price last buyer would be willing to pay for one additional unit.
- Include values for all water services that can be estimated with fairly reliable data and techniques.
- "Shadow price": Costs and benefits in monetary terms, using prices and quantities to evaluate alternative allocations of water among competing users. When market prices fail to reflect true economic values, they can be adjusted to accommodate these distortions. Where there is no market price, the price must be estimated.
- Economists use techniques to estimate shadow prices for cost-benefit analyses of projects and policies.
- New: Project exposure to rising costs. 25% rise in water prices in 30 U.S. cities between 2010 and 2013 (Circle of Blue)

Environmental economics

Water valuations for corporate accounting

Full economic costs	Societal costs (externalities)	Environmental costs	Non-water-related impacts (e.g., GHGs)
		Resource costs	Water-related impacts (e.g., loss of in-stream values)
			Foregone opportunity costs (e.g., other abstraction values lost)
	Financial costs (including any internalized environmental or resource costs)		Administration
			Operation & maintenance
			Capital

Source: WBCSD, 2009;

- Integrated information on stocks and flows – replenishment, extraction and depletion
- Framework for monitoring and evaluation over time
- Organises information to assess risks, sustainability and future prospects

Environmental economics

Portfolio application

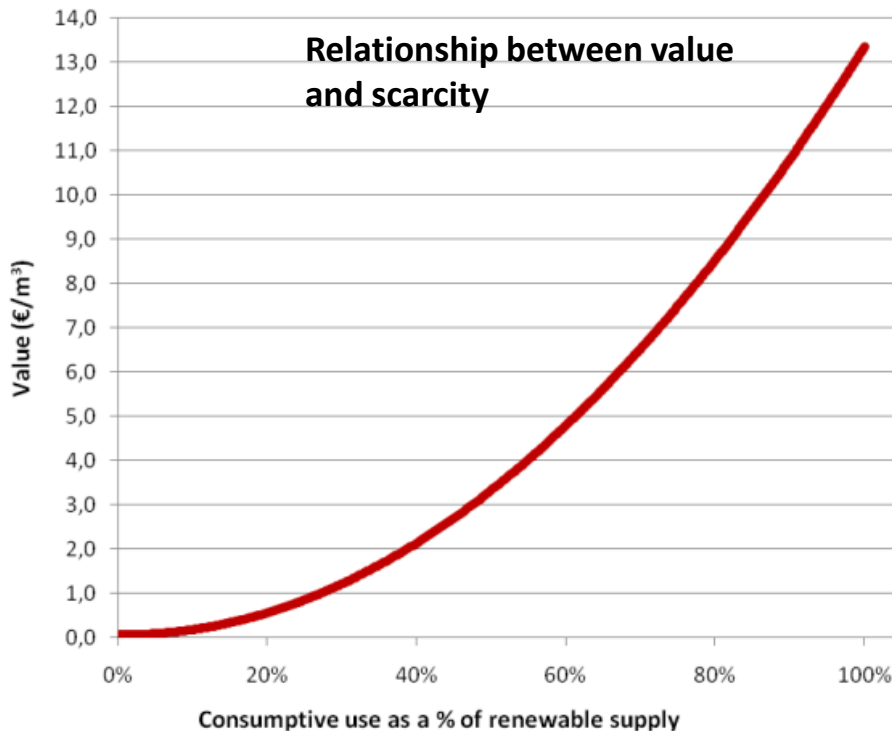
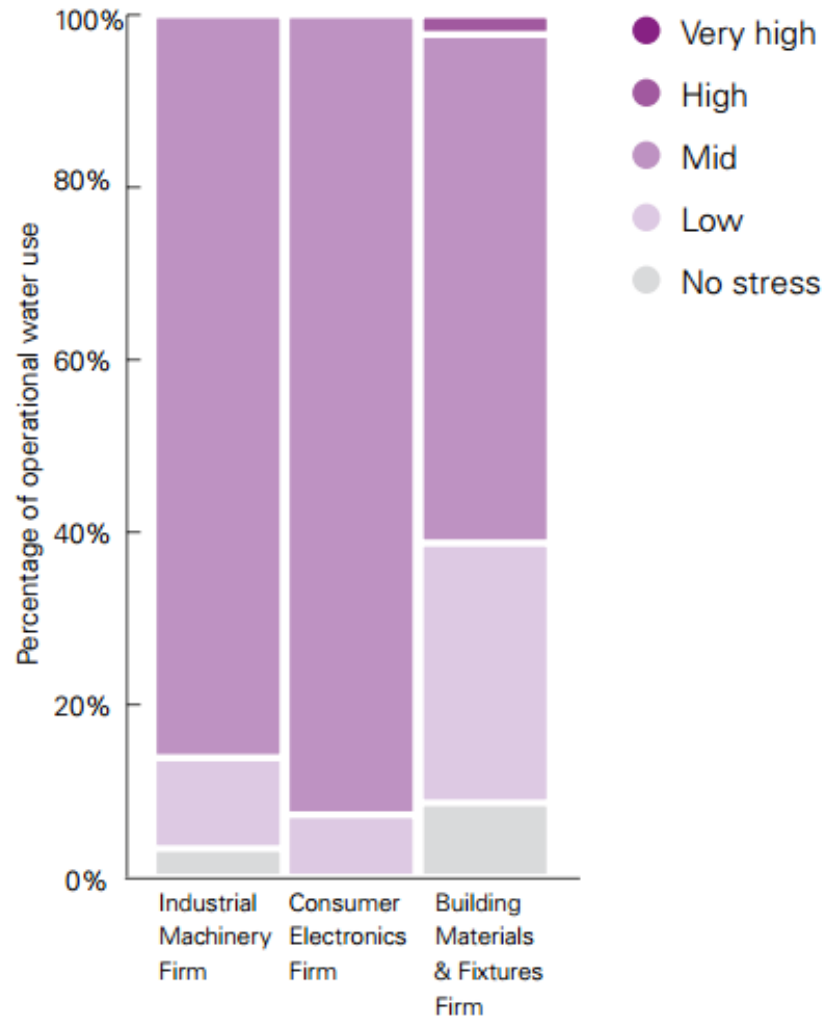


Figure 5: Breakdown of company water risk profiles – water use by level of water stress



Source: Trucost Plc

Data availability and transparency

Water data

Geographical

- Water values usually site-specific - data often not available.
- Benefits transfer approach – applying values obtained from one study site to other sites has limitations.
- Methods and assumptions for valuations not standardised, uncertainty
- Variability and projections.

Corporate

- Company-wide global vs. site level; operational vs supply chain, groundwater vs. surface water sources, withdrawals vs. consumptive use and recycling, cooling vs. operational.
- Bloomberg, CDP, Trucost, MSCI, Maplecroft

Integration of Natural Capital Risks

in Credit Risk Assessment and Valuation

General Approach:

- Source and combine data on ecosystems as well as companies resource dependence.
- Quantify the risks resulting from ecosystem degradation (including climate change) and overuse of resources using environmental economics approaches.
- Determine impact on financial metrics through cash-flow analysis (at company level) and/or scenario models based on probabilities.
- Integrate into standard valuation and credit risk assessment models.

Initiatives to Develop Methodologies/ Tools

E-Risc

Global Footprint Network and UNEP-FI (Contact: anders.nordheim@unep.org)

Phase I: Assessed the materiality and relevance of natural resource-related risks for sovereign credit risk analysis.

Approach:

1. Examine the country's natural resource situation (**bio-physical analysis**).
2. Combine with information about the structure of the economy to determine the magnitude of potential impacts resulting from the natural resource situation (**economic analysis**).
3. Consider the macroeconomic situation to determine the ability of the country to absorb a natural resource-related shock (**financial resilience analysis**)

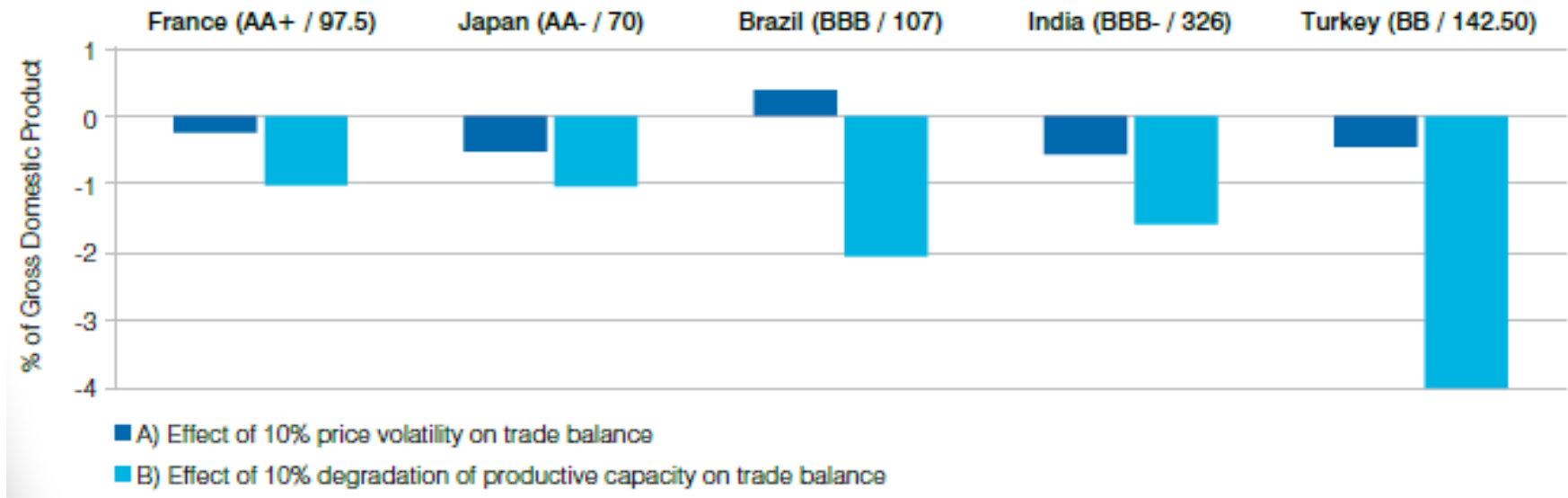
Phase II: Improve the robustness of the developed methodology and test the methodology within existing sovereign credit risk models

Initiatives to Develop Methodologies/ Tools

E-Risc

Key Findings Phase I:

- Countries present highly differentiated risk profiles.
- Natural resource risk is poorly correlated with traditional sovereign credit risk metrics.
- Risks are significant enough to potentially affect the ability or willingness of a country to service or repay its sovereign debt.



Initiatives to Develop Methodologies/Tools

Project on water risks in corporate bond investments

Key Questions:

- For which sectors are water risks significant?
- How can water risks be identified, assessed and quantified?
- How can water risks be integrated into financial risk assessments of corporate bonds?

Planned results:

- Develop specific methodologies to quantify water risks in fixed-income investments.
- Produce a first-cut framework and demonstration tool to assess water risks across corporate bond portfolios and integrate indicators of exposure to water scarcity/volatility into credit risk assessments.
- Build the capacity of finance professionals to assess the materiality of water risks, quantify water metrics, and incorporate these risks directly in the credit risk analysis for corporate bond valuations.

Initiatives to Develop Methodologies/Tools

Project on water risks in corporate bond investments



Project timeline

Role of participating financial institutions

2014

Sept.

Oct.

Nov.

Dec.

Jan/15

Feb.

Mar

Apr.

May

June

July

Aug.

Phase 1: Preparation and assessment of needs and scope.

Phase 2: Research and framework development.

Phase 3: Testing application of methodology through trial of tool by financial institutions

Phase 4: Refine and enhance framework.

Phase 5: Launch Exposure Draft framework

input on scope, research design, tool requirements, current risk assessment procedures, relevant methodologies.

review of draft methodology

Test tool on your corporate bond portfolio and provide feedback

participation in launch event

NCD Pilot Projects to develop tools to integrate Natural Capital Risks

Bloomberg-Tool

- Methodology to stress test mining companies for water risk.
- Potential asset standing using scenarios.
- Combines WRI Aqueduct data on water availability with Bloomberg data on mining company reserves, production, financials and water use.
- Site level aggregated to company level risk.
- Integrate potential water supply impacts on cash flows in DCF valuation model.
- Benchmark copper and gold miners on exposure to water stress.
- NCD Signatories to be invited to test the tool and evaluate the methodology.
- Future developments: Integrate water valuations to apply to other sectors.

NCD Pilot Projects to develop tools to integrate Natural Capital Risks

IFC-led Pilot Project

- Understanding natural capital risks for financial institutions and embedding them in credit risk assessments.
- Banking work stream: IFC, Banorte, National Australia Bank, Unicredit, Investment work stream: Caisse des Dépôts, Pax World, Calvert
- Corporate finance; listed equities, corporate fixed income, project finance.
- SocioVestix/ICMA Centre/Henley Business School scoping study: Identify approaches and methodologies to map natural capital risks across portfolios (*Phase 1*).
- Develop approaches to integrate natural capital factors into credit risk assessment + potentially suggest practical ways to create risk-adjusted premiums/cost of capital (*Phase 2*).

NCD Pilot Projects

GIZ/NCD/VfU project (2014/15)

**Corporate Bond Water Risk
Tool**

**Indicators: Water use and
water stress**

Sectors: All/Relevant

Asset class: Corporate bonds

Outputs: Framework and tool to integrate water factors into credit risk analysis for corporate bonds.



IFC-led project (2015-17)

Understanding natural capital risks for financial institutions and embedding them in credit risk assessments.

Indicators: All relevant natural capital factors

Sectors: All sectors, focus on high-risk

Asset classes: Corporate finance; equities, corporate fixed income, project finance.

Outputs: Framework and indicators to benchmark portfolio companies on exposure to natural capital-related risk across industries, geographies. Methodology to integrate natural capital factors into credit risk analysis.



Thank you very much for your kind attention!

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