QUANTIFYING THE NATURAL CAPITAL RISK EXPOSURE OF FINANCIAL INSTITUTIONS IN BRAZIL

PRESENTATION OF THE JOINT STUDY

Dr Richard Mattison, CEO
Trucost Plc
• Introduction to Trucost
• Importance of this study
• What is natural capital and how to we account for it?
• Why is this relevant for Brazilian financial institutions in particular?
• What are the drivers for internalising environmental costs and why is it a risk now?
• Key findings of the report
• Case study
• Integrating natural capital analysis in equity analysis
• Recommendations
Trucost helps investors to understand the economic consequences of natural capital dependency in order to identify risk and opportunity from growing natural resource pressures and environmental costs.
IMPORTANCE OF THIS STUDY

Some drivers take a long time to materialize and require government intervention but there are other mechanisms by which external costs can be rapidly internalised by economies, companies, investors.

This study is a first step to demonstrate how natural capital accounting can be used to analyse companies, portfolios and loans.

Investors and banks will need to apply the approach to their own investments in order to quantify the risks.

Risk teams need to anticipate these material issues, first quantifying risks to investments and then financing.
What is natural capital and how do we account for it?
NATURAL CAPITAL
NATURAL CAPITAL ACCOUNTING

IMPACTS

- VOCs
- CO
- PM_{10}
- NOx
- NH_{3}
- SO_{2}

VALUATION

- HEALTH
- CROPS
- TIMBER
- CORROSION
- WATER ACIDIFICATION

COSTS PER TONNE $
WHAT IS THE SCALE?

$2.2tn

Environmental damage caused by world’s largest 3,000 companies

>50%

Proportion of company earnings that could be at risk from environmental costs
VALUING NATURAL CAPITAL HELPS US TO:

• DETERMINE IMPACT MATERIALITY
• ASSESS ENVIRONMENTAL TRADE-OFFS
• UNDERSTAND REGIONAL RISK DIFFERENCES
• INTEGRATE THE RESULTS WITH BUSINESS METRICS
• COMMUNICATE THE RESULTS TO A GENERAL AUDIENCE
TRENDS IN NATURAL CAPITAL ACCOUNTING
LEADERSHIP INITIATIVES

INVESTORS

SOVEREIGN

NGOs

CORPORATIONS

MULTI-STAKEHOLDER GROUPS

UNEP Finance Initiative
PRI Principles for Responsible Investment
Natural Capital Declaration
GCP
CONSERVATION INTERNATIONAL
Waves
Coca-Cola
FEMSA
novo nordisk
Weyerhaeuser
Yarra Valley Water
Veolia
General Mills
Monsanto
Dow
Puma
Bayer
THE B TEAM

The Nature Conservancy
Protecting nature. Preserving life.
Why is this relevant for Brazilian financial institutions in particular?
RELEVANCE FOR BRAZILIAN FINANCIAL INSTITUTIONS

- Economic reliance on natural capital
  - Agriculture accounted for 22% of Brazil’s GDP in 2012

- Demand and supply side pressures
  - Rapidly growing population

- Strengthening legislation
  - Potential compliance or litigation costs

- Equity investments
  - 28% of PF assets invested in equities - high exposure to companies facing natural capital costs

- Corporate bonds
  - Internalising costs could lead companies to default

- Corporate lending
  - Food and bev = largest sector for lending and highly dependent on natural capital

LACK OF A FRAMEWORK FOR TAKING ACCOUNT OF NATURAL CAPITAL RISK
What are the drivers for internalising environmental costs and why is it a risk now?
FACTORS THAT INTERNALISE AN EXTERNALITY

WHY IS INTERNALISATION A RISK NOW?

• Changing demographic
• Public awareness
• Increasing regulation/voluntary commitments
• Market dynamics
• Stakeholder action
• Climate risks
• Resource depletion
Key findings from the report
KEY FINDINGS FROM THE REPORT

• Unpriced natural capital costs of companies could be as much as R$1,646bn

• Banks are most exposed through financing of cattle ranching, fishing, food and beverages and agriculture

• Pension funds are most exposed through investments in food and beverage companies

• The natural capital risk exposure of financial institutions can vary significantly
KEY FINDINGS FROM THE REPORT

• The sectors cattle ranching, soya bean farming, crude petroleum and natural gas extraction have the highest natural capital costs.

• The highest natural capital intensity sectors (unpriced natural capital costs per R$ m of production) include cattle ranching, fats & oil refining, aquaculture, cotton farming, sugarcane farming and cement manufacturing.

• The North of the country has the highest land use conversion cost because it is principally made up of Amazon rainforest.

• There is a marked difference in the natural capital impacts of soy production in the two principal production zones.
CREDIT EXPOSURE OF TWO BANKS

The chart above illustrates the credit exposure of two banks across various sectors. The sectors include Agriculture, Siderurgy and Metallurgy, Energy, Oil & Gas, Construction, Food and Beverage, Paper and cellulose, Transport, Other Manufacturing, Chemicals, Petrochemicals, Fishing, Livestock, Mining, Water, and Forestry. Each sector is represented by two bars, one for each bank, indicating the percentage of credit exposure.
 NATURAL CAPITAL RISK BY INDICATOR AND NCEX RATIO

Banking Industry

Bank A

Bank B

GHG LHS  AP LHS  WASTE LHS  LUC LHS  H2O LHS  WATER POLLUTION LHS  NC EXPOSURE RATIO
NATURAL CAPITAL COST - DIRECT AND SUPPLY CHAIN - AND NATURAL CAPITAL INTENSITY PER SECTOR (WITH AND WITHOUT CATTLE RANCHING)
ENVIRONMENTAL IMPACT ANALYSIS BY SECTOR
GHG AND WATER IMPACTS THROUGH THE SUPPLY CHAIN
## REGIONAL COMPARISON

<table>
<thead>
<tr>
<th>SECTOR NAME</th>
<th>BRAZIL</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Northern</td>
</tr>
<tr>
<td>Soybean Farming</td>
<td>3%</td>
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<tr>
<td>Cotton farming</td>
<td>0%</td>
</tr>
<tr>
<td>Sugarcane Farming</td>
<td>0%</td>
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<tr>
<td>Cattle Ranching and farming</td>
<td>19%</td>
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<tr>
<td>Logging</td>
<td>10%</td>
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<tr>
<td>Crude Petroleum and Natural Gas Extraction</td>
<td>6%</td>
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<tr>
<td>Iron ore mining</td>
<td>29%</td>
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<tr>
<td>Hydroelectric Power Generation</td>
<td>17%</td>
</tr>
<tr>
<td>Cement manufacturing</td>
<td>3%</td>
</tr>
<tr>
<td>Primary smelting and refining of nonferrous metal (except copper and aluminum)</td>
<td>2%</td>
</tr>
</tbody>
</table>
Case Study
BEEF CATTLE RANCHING IN BRAZIL

HOW DEFORESTATION LEADS TO FINANCIAL RISK FOR INVESTORS

DEFORESTATION AND DEGRADATION OF LAND

PRIMARY AMAZON FOREST

CYCLES OF DEGRADATION

PASTURE (BASELINE)

ASSET BASE DEGRADATION

REDUCED SOIL FERTILITY

REDUCED REGULATORY & PROVISIONING ECOSYSTEM SERVICES

REDUCED ABILITY TO:

SERVICE DEBT

DELIVER SHAREHOLDER RETURNS

RISK INCREASES WITH DURATION OF INVESTMENT

T-0

REDUCED YIELDS

REPUTATIONAL RISK

MARKET RISK: EXCLUSION FROM SUPPLY CHAINS

INCREASED OPERATIONAL COSTS (FERTILISER, IRRIGATION)

-INCREASED EXPOSURE TO REGULATORY COSTS

T-25
REGIONAL DIFFERENCES

FIGURE: LAND USE CHANGE INTENSITY PER REGION (R$M REVENUE)
## RISK MATRIX

### LEGEND

<table>
<thead>
<tr>
<th>RISKS</th>
<th>PROBABILITY</th>
<th>TIMEFRAME</th>
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<tbody>
<tr>
<td>Operational</td>
<td><img src="#" alt="High" /></td>
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<tr>
<td>Policy/Regulatory*</td>
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<tr>
<td>Reputational</td>
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<tr>
<td>Climate **</td>
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<tr>
<td>Market Risks***</td>
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</tr>
<tr>
<td>Resource Depletion</td>
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<td>5</td>
</tr>
<tr>
<td>Subsidy Risks</td>
<td><img src="#" alt="Low" /></td>
<td>5</td>
</tr>
</tbody>
</table>

* Policy risks due to changes in legislation and/or voluntary commitments.

** Climate risks includes adaptation and mitigations risks

*** Market risks due to changing consumer preferences

**** Probability of risks materializing

### PROBABILITY

- **High**
- **Medium**
- **Low**

### TIMEFRAME

- **Short term = 1**
- **Short – Medium term = 2**
- **Medium = 3**
- **Medium – Long term = 4**
- **Long term = 5**
Integrating natural capital analysis in equity analysis
INTEGRATING NATURAL CAPITAL IN FUNDAMENTAL EQUITY VALUATION
Recommendations
OPPORTUNITIES

REVENUE GROWTH

- New client services
- Low carbon business opportunities
- Environmental trading
- Low carbon client solutions
- ESG asset management
- Green retail banking products
- Resource efficiency
- Partnership opportunities

RISK REDUCTION

- Natural capital exposure
- Climate volatility
- Policy risks
- Insurance costs
- Resource cost volatility
- Client resilience
- Mega trends

FINANCIAL INSTITUTION

REPUTATION

- Stakeholder pressure
- Peer ranking
- Talent retention
- Branding and image
RECOMMENDATIONS

1. Quantify portfolio-level natural capital exposure

2. Identify drivers for cost internalization

3. Demand better data from companies

4. Consider the potential future natural capital risk that a company may face

5. Capitalise on changing market demand for more sustainable goods and services

6. Help customers transition to a more resource efficient and sustainable business model
"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."