Sovereign, Banking and Climate Risk at the EIB

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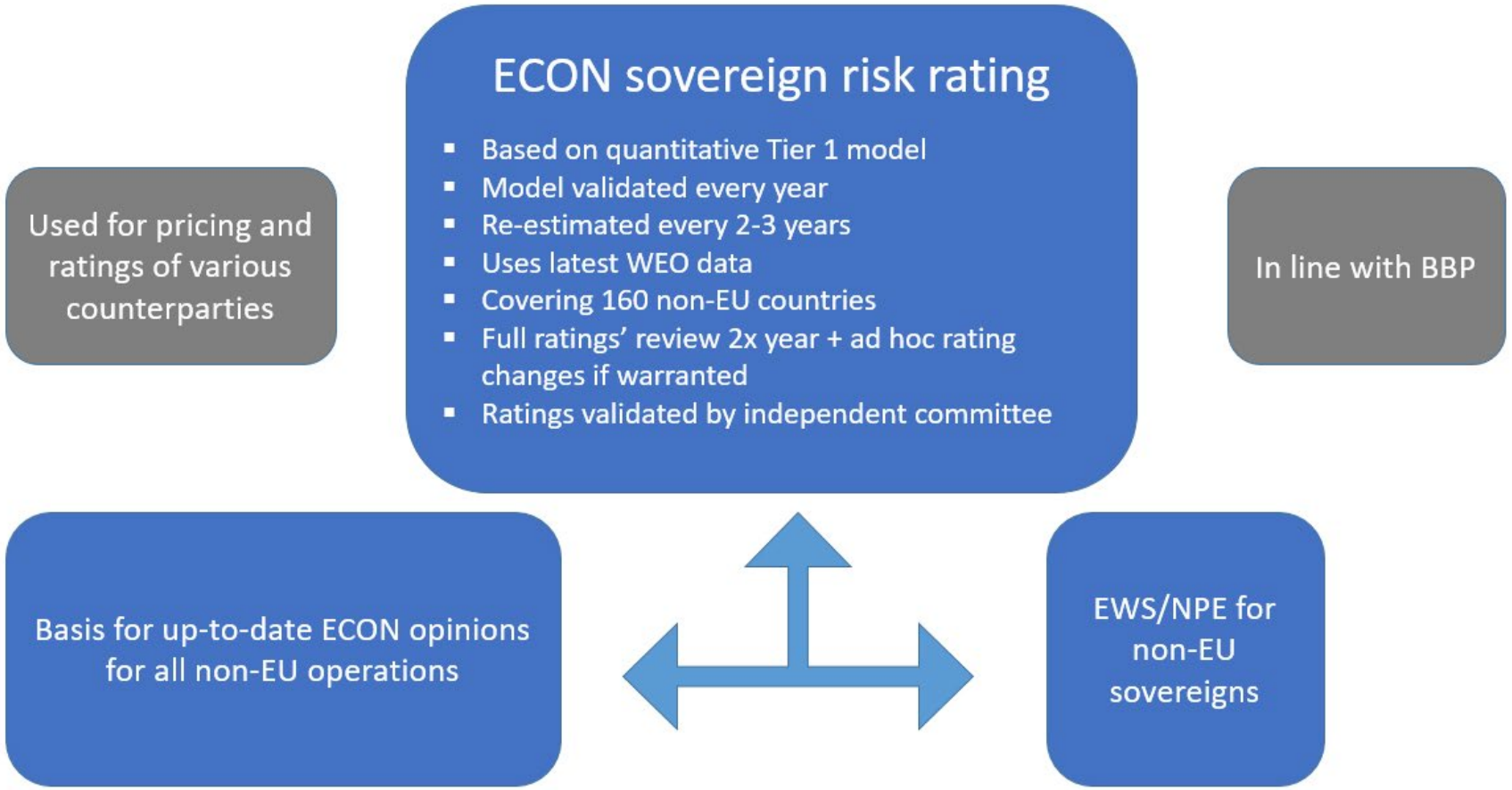
EIB country risk assessment



Sovereign Ratings and Risk Scores

Purpose and scope – Sovereign Ratings

- Assessment of the ability and the willingness of the sovereign issuer to meets its obligations vis-à-vis creditors
- Ratings for all countries to which the EIB is currently exposed or is likely to develop an exposure – except for EU countries

Use

- Risk-pricing
- Eligibility criterion for guarantees and certain activities
- Risk-measurement (capital requirements, provisioning)
- Derivatives/treasury operations
- **Banking Industry Risk and Macroeconomic Risk scores**
- Both scores are included in the EIB's rating model for financial institutions)

Rating and validation/monitoring process

expert adjustment

validation by rating Validation Committee

model validation

validation of the models: annually and after each model revision

performance monitoring

model performance monitoring at the end of each regular rating round

Expert ratings and scores

expert rating/scores = model rating/score + expert adjustment

Model ratings and scores

- Based on four performance factors
- Model rating is a linear combination of indicators
- Model specification follows extensive estimations
- Data treatment:
  - Outliers are removed
  - Current and forward looking data (5y GDP growth)

Expert adjustment

- Based on the judgement of the country expert
- Takes into account:
  - factors not included in the models
  - more recent information (e.g. acquired during missions)
  - country-specific situation
  - global developments
  - (economic and banking) outlook
  - Climate risk

Sovereign rating model

Size and Development	• GDP per capita • Nominal GDP
Economic Performance	• Investment • Inflation • Future GDP growth
Public Finances	• Government debt • Implicit interest rate
External Sector	• Current Account • NIIP • Exchange rate regime and foreign reserves
Institutional Quality	• World Governance Indicators

Banking Industry Risk Model

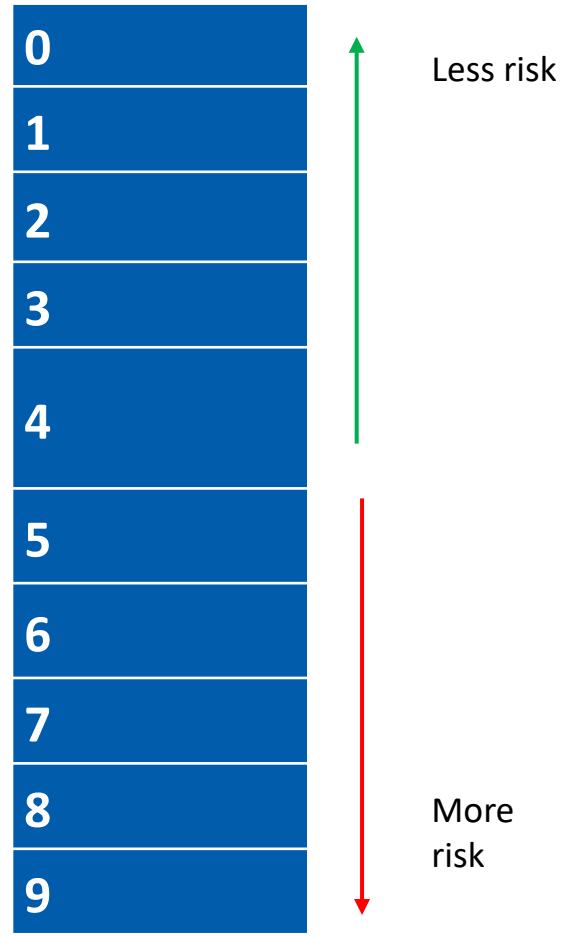
Regulatory and Institutional Environment	• Financial Action Task Force • EIB Sovereign rating
Industry Structure	• Bank ownership • Bank concentration
Performance and Soundness	• Non-performing loans • Return on Assets • Credit to private sector • Loans over assets • Loan to deposit ratio
Economic cycle	• Unemployment rate

Rating and risk scales

Sovereign ratings scale

	Credit risk	Default	Remark
Aaa	Lowest level of credit risk		Investment grade
Aa1 – Aa3	Very low credit risk		
A1 – A3	Low credit risk		
Baa1 – Baa3	Moderate credit risk		
Ba1 – Ba3	Speculative, substantial credit risk	Default unlikely but risks are present and must be acknowledged	
B1 – B3	Speculative, high credit risk	Default risk is material even if loss may be minimal (default risk still <50%)	Speculative grade
Caa1 – Caa3	Speculative, very high credit risk	Default is a real possibility (risk >50%)	
Ca	Highly speculative, very high credit risk	In or very near to default, with some prospect of recovery of principal and interest	
C	Exceptionally high credit risk	Typically in default with little prospect for recovery of principal or interest	
D			Internal default

Macro and BIR scores



EIB Climate Risk Country Scores

EIB/ECON developed an indicator that comprehensively covers the various dimensions of **Climate risk**:

1) physical risk

2) transition risks

- … taking into account Adaptation and Mitigation capabilities of the country

The model was **internally validated**

EIB Climate Risk Country Scores

- covering 186 countries
- Range 1 – 5 (1=best, 5=worst), or 1-10
- “cleverly” aggregated (not equally weighted)

It serves the need of EIB risk management framework being an input for the **Climate Change Screening Tool**

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Climate Risk

- **Physical Risk**
  - Acute Risk
    - Extreme weather events: storms, floods, droughts, etc.
  - Chronic Risk
    - Gradual Global Warming: Sea Level Rise (SLR), infrastructures, higher temperatures, water scarcity
  - Adaptation
    - Policy and institutions, ability and willingness to respond
- **Transition Risk**
  - Exposure
    - Energy rents
    - Emissions
  - Mitigation
    - Renewables
    - Energy Efficiency
    - Action plans

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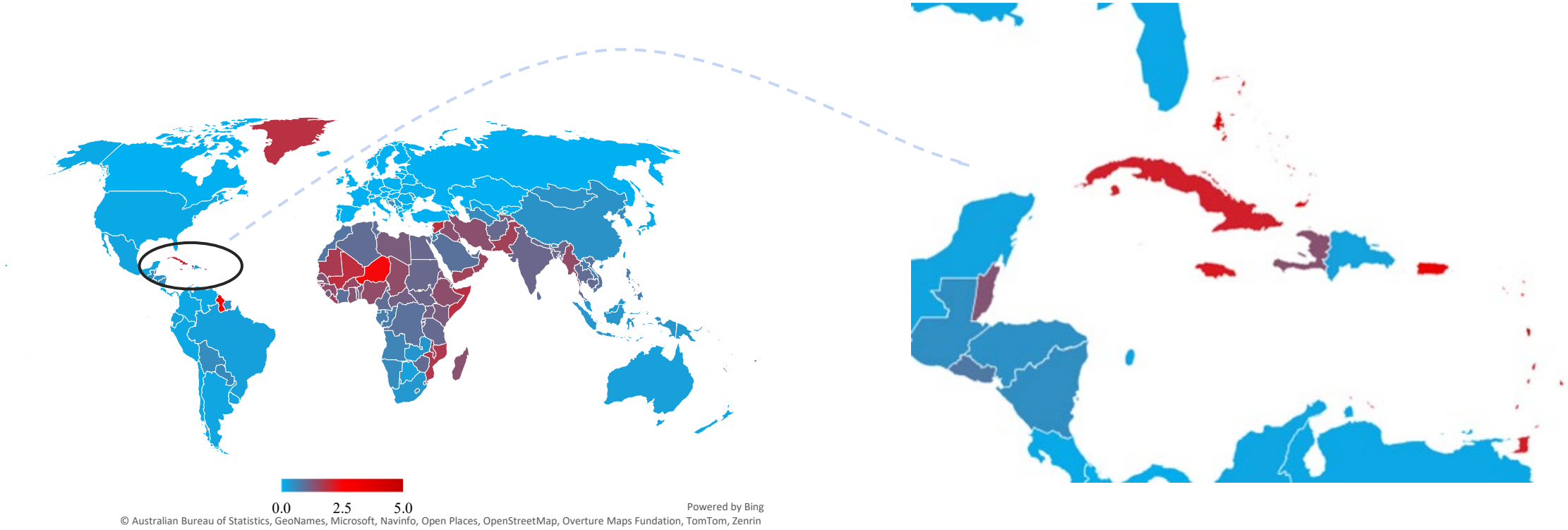
Countries are scored in relative terms, and relative to their capacity to withstand the climate risks

Physical Risk

Poorer, smaller, and exposed to waters and heat



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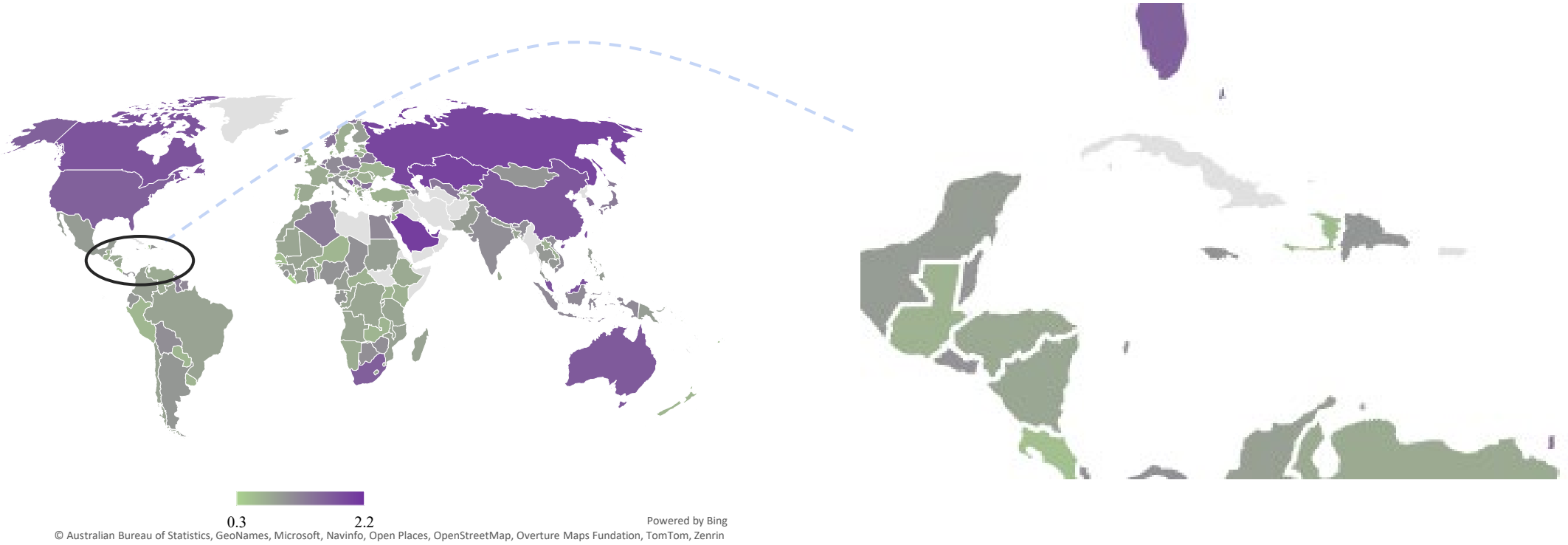
Countries are scored in relative terms, and relative to their capacity to withstand the climate risks

Transition Risk

Fossil fuel producers, developed and those with delayed climate action plans



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Physical risk building blocks

Physical Risk	Acute Risk	Extreme weather events	Extreme weather events (floods and landslides, extreme temperatures, storms, droughts and wildfires): % impact on GDP
	Chronic Risk	Gradual Global Warming: higher temperatures, sea level rise	• Agriculture: % on GDP, production loss • Sea Level Rise (SLR): % on GDP • Infrastructures: cost of upgrade • Higher temperature: productivity impact • Water Scarcity
	Adaptation	Policy and institutions, ability and willingness to respond	• Fiscal Revenues (% of GDP) • Sovereign Risk Rating • Governance indicators • UN Human Development index

Physical risk: variables and sources

Dimension	Feature	Variables used	Unit	Source	Type of source
Physical Risk: Acute	Hydrogeological (floods and landslides), Meteorological (extreme temperatures, storms), Climatological (drought and wildfires) impacts	Damages	% of GDP	EM-DAT	dataset
		Germanwatch	Rank (based on % GDP impact)	Germanwatch	dataset
	Lower crops	Agriculture	% of GDP	WDI	dataset
		Production Loss	% of GDP	FAO (2017)	Academic paper
Physical Risk: Chronic	Impact of Sea Level Rise (SLR)	GDP impact	% of GDP	Diaz (2016)	Academic paper
	Need of upgrading infrastructures	Adaptation gap	index, % of GDP	World Bank (2016)	Academic paper
	Impact of heat on productivity	Labour productivity	%	McKinsey (2020)	Academic paper
		Monthly average Temperatures	Celsius degrees	World Bank	dataset
	Water scarcity	GDP impact	% of GDP	World Bank (2016)	Academic paper

Transition risk: the framework

The risk associated to the transition to a net zero economy starts from the Kaya identity, augmenting it

$$\frac{CO_2}{POP} = \underbrace{\frac{E}{GDP}}_{\text{energy intensity}} * \underbrace{\frac{CO_2}{E}}_{\text{CO2 intensity}} * \frac{GDP}{POP}$$

Exposure		Mitigation		
Fossil fuels rents (coal, oil, gas)	CO2 Emissions	improvements of energy efficiency	promotion of low-carbon sources of energy (i.e. renewables)	Countries` commitments/ preparedness

Transition risk: variables and sources

Dimension	Feature	Unit	Source
Revenues	Revenues from coal export	% of merchandise exports	WB
	Revenues from oil export	% of merchandise exports	WB
	Revenues from gas export	% of merchandise exports	WB
Costs	GHG emissions	MMtonnes CO2/capita	EIA
Climate action	Energy consumption per capita or GDP	quad BTU/capita or /GDP	EIA
	Renewables production	% of final energy consumption	EIA
	Commitments to mitigate GHG emissions	0-1	CAIT/NDCs
Macroeconomic	Gross Domestic Product	$2015PPP	EIA
	Population	M persons	EIA
Thresholds: 2°C scenarios	Global GHG emissions budget 2030	GT CO2	UN
	Global consumption 2030	PJ	IEA
	Global population development	M person	UN