BANCA D'ITALIA
EUROSISTEMA

Carlo Alberto Workshop
Climate change, credit risk and Covid 19
Turin , 5 November 2020

ESG, E and climate change: mind the gap! Data and fixed income portfolio construction

Enrico Bernardini

Financial Risk Management Directorate
Department Markets and Payment Systems
Banca d'Italia

(Opinions expressed herein are on my own responsability and do not involve in any case the Istitution)

Outline

1. Climate change and credit risk - threats and management
2. ESG data materiality and suitability for sustainable investment
3. Managing fixed income portfolios with sustainability factors
4. Covid and its effects on sustainable bond market

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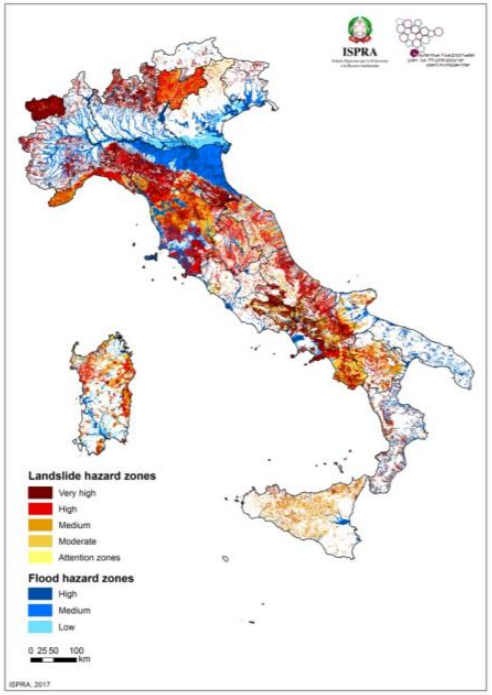
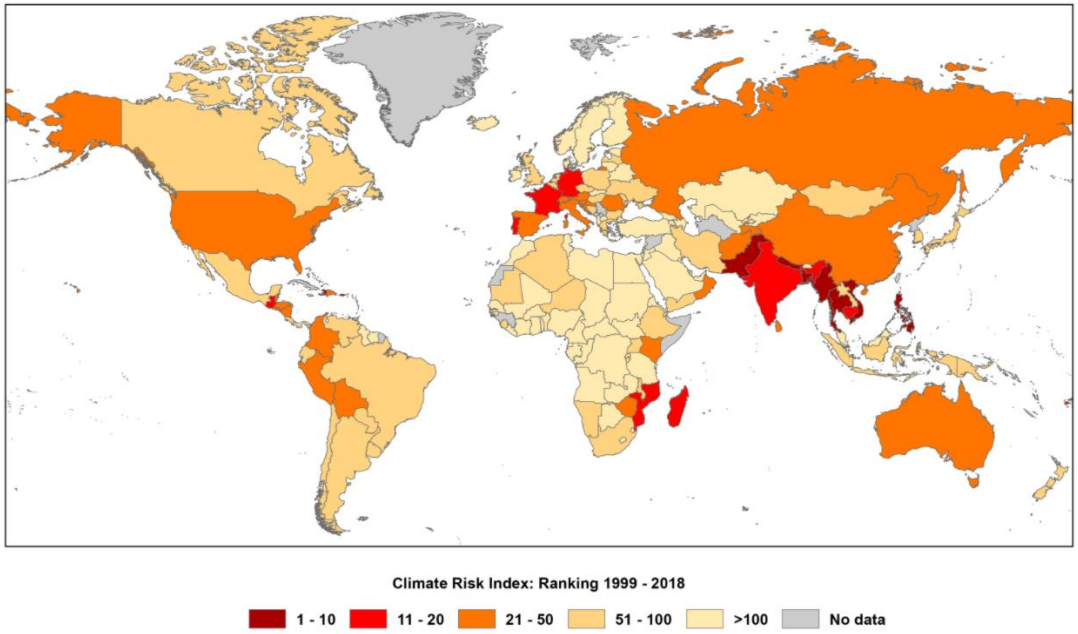
Climate change risk- physical risk

- Climate change is a threat to economic and financial system
- Main trasmission channels are physical risk and transition risk

Flood and landslide risk in Italy (ISPRA 2018)



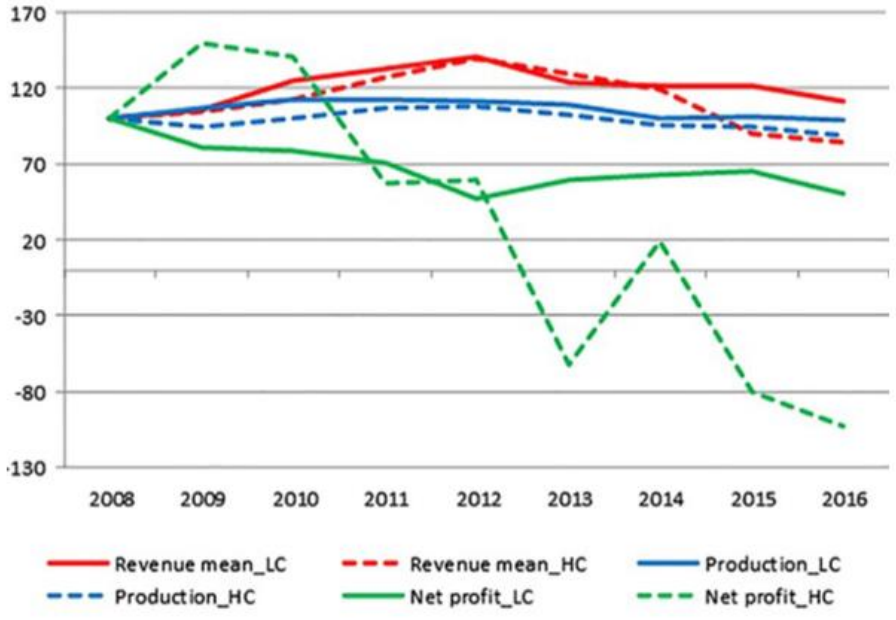
Climate change risk index (Germanwatch 2020)



Climate change – transition risk

Carbon transition risk has affected EU electric utilities via profitability and market performance

Turnover, production and net profit (Index 2008 = 100)



Two competing portfolios (High Carbon and Low Carbon) and their difference (LMH)

(Index 31 dec 2005= 100)

Bernardini, Di Giampaolo, Faiella and Poli, The impact of carbon risk on stock returns: Evidence from the European electric utilities, *Journal of Sustainable Finance & Investment*, N.26, 2019

Climate change - authorities and practices

- TCFD recommendations (2017), ECB Guide for banks - in consultation (May 2020), NGFS Guide for Supervisors (May 2020):
  - governance,
  - strategy,
  - risk management
  - metrics and targets

- NGFS Overview of Environmental (and Climate) Risk Analysis:
  - lack of awareness among financial intermediaries
  - limited capacity and application of ERA methodologies
  - gaps in data and methodologies
  - low disclosure

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ESG, E and climate change data – mind the gap!

arabesque

ISS-oekom

MSCI | MSCI ESG RESEARCH INC.

REFINITIV

RepRisk
Due diligence on ESG and business conduct

ROBECOSAM
We are Sustainability Investing.

SUSTAINALYTICS

Trucost ESG Analysis
S&P Global

vigeo eiris

- ESG scores measure environmental, social and governance profiles for companies/States/funds
- **Materiality** of each ESG factors can refer to either **financial** or **sustainable** dimension
- More than 600 ESG ratings worldwide

Example of ESG topics

ENVIRONMENTAL	SOCIAL	GOVERNANCE
▪ Climate change ▪ Natural resources use ▪ Pollution ▪ Opportunities in clean-tech ▪ Opportunities in renewable energy	▪ Human capital management ▪ Product safe&quality ▪ Supply chain labour standards ▪ Opportunities in health lifestyle	▪ Shareholders rights ▪ Board composition and compensation ▪ Internal codes of ethics ▪ Anti-corruption-ML ▪ Anti-competitive practices

ESG data and providers – challenges & improvements

ESG score challenges:

- data quality
- comparability
- coverage
- bias across size, sector and region
- low correlation of ESG scores from different providers

Improvements

- disclosure standards
- taxonomy
- mandatory regulation
- transparency in methodologies

	Sustainalytics	MSCI	RobecoSAM	Bloomberg ESG
Sustainalytics	1	0.53	0.76	0.66
MSCI		1	0.48	0.47
RobecoSAM			1	0.68
Bloomberg ESG				1

State Street - The ESG Data Challenge (2019) – MSCI World index, June 30, 2017

ESG and climate change data: financial materiality

- Machine learning application to ESG metrics and scores of 2 ESG providers(1) underscores the relevance of **forward-looking evaluation** for the environmental issues and climate-change risk
- the **transition risk** implies the assessment both of the exposure and the ability to manage risks (via **renewables** and **clean technologies**)

	Return	Variance	Sharpe	Total	Biv
Waste/Revenue	0.013808	-0.0072546	0.35684	3	0
CO2 Emissions/Revenue	0.013171	-0.0057402	0.35125	3	0
Hazardous Waste/Revenue	0.0051957	-0.0079682	0.16283	3	0
Climate Change Theme Score	0.00338	-0.0016526	0.11476	3	0
Waste Recycling Ratio	0.0080097	8.1759e-05	0.2737	2	0
Prod. Carbon Footprint Score	0.0041826	0.0002437	0.14035	2	0
Prod. Carbon Footprint Mgmt	0.0038396	0.00025081	0.14645	2	0
Emission Reduction Objectives	0.0038287	-0.00071986	0.071566	2	1
Water Use/Revenue	0.0018263	-0.00064089	0.1227	2	0
Eco-Design Products	0.0075791	0.0014373	0.10354	1	1
Environmental Score	0.0068444	0.00079796	0.083197	1	0
Energy Use/Revenue	0.0030538	-0.0021816	0.095028	1	0
Opportunities in Renewable Energy Score	0.0029098	7.8753e-05	0.11179	1	0
Nuclear	0.0025489	-0.0031798	0.068439	1	1
Opportunities in Clean Tech Score	0.0024122	0.00036662	0.11353	1	0
Opportunities in Renewable Energy Exp	-0.00052838	-0.00047105	-0.011381	1	0
Animal Testing	-0.0026548	-0.0018501	-0.077037	1	1

(1) Source of ESG scores: Reuters Asset4 and MSCI ESG Research

Return = ESG contribution to return difference BmW
Variance = ESG contribution to variance difference BmW
Sharpe = ESG contribution to Sharpe ration difference BmW

Lanza, Bernardini, Faiella (2020), Mind the gap!
Machine learning, ESG metrics and sustainable investing, Banca d'Italia Occasional Papers

Climate change – methodological issues

- Carbon intensity is backward looking measure
- Data gaps for carbon emissions (scope 3)
- Modelling challenges for forward looking data
  - Uncertainty, Endogeneity, Non linearity
  - No standards in estimation methodologies
  - Alignment/Physical risk estimation

For fixed income: top-down analysis

Scenario analysis
Stress testing

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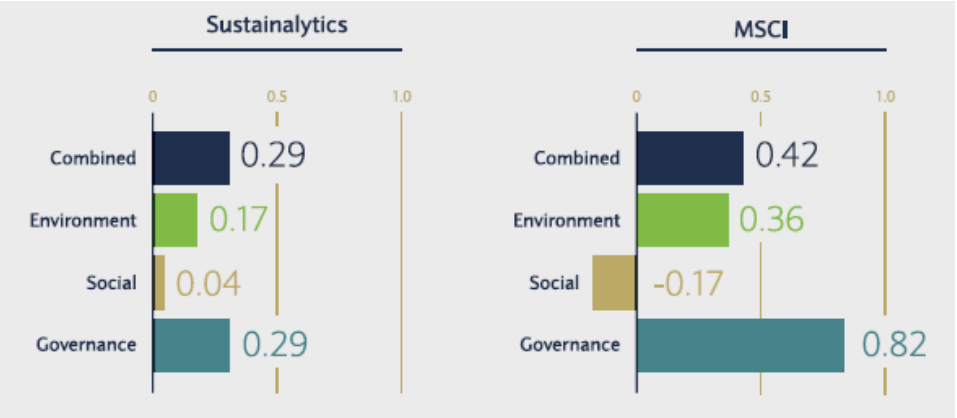
ESG and fixed income

1. ESG data coverage is limited
2. ESG factors:
   - Negative correlation among ESG data and spread(1)
   - governance is more material for return differential(2)

Correlation between IG bond spreads and ESG factors in Euroarea

	ESG	E	S	G
Option Adjusted Swap	-0,09	-0,05	-0,02	-0,07
Asset Swap Spread	-0,11	-0,02	-0,02	-0,08
return_12m_fw	-0,03	-0,03	0,02	-0,04

Bloomberg Barclays US Corp IG
portfolio return difference H-L score (2009-16)



(1) Our own calculations for a case study on Euro area corporate bonds 2014-2019.
(2) Barclays Research (2016). Sustainable investing and bond returns.

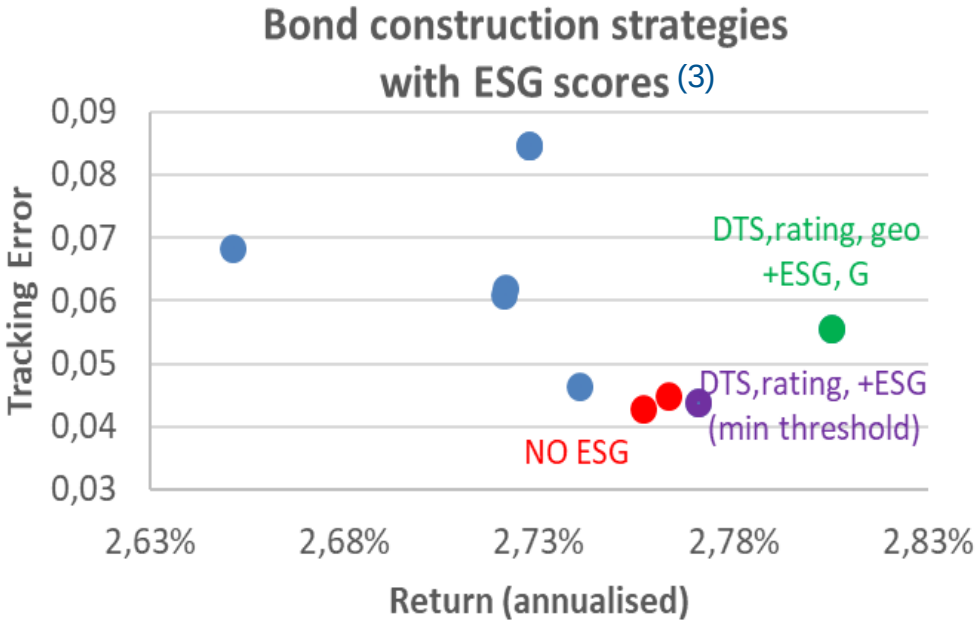
Bond portfolio construction and ESG - a case study

Combining standard financial factors with ESG tilt can enhance return while keeping low the tracking error

Case study: sample replication of Euro area IG non-financial corporate bond (case study 2014-2019)

1. Financial factors(1)
   - **Duration**
   - **Spread**
   - **Sector**
   - **Rating**

2. ESG, E and G factors(2)



(1) Gouzilh et al. (2014), The Art of Tracking Corporate Bond Indices, Amundi Working Paper, n. 42.
(2) Source: ESG data from MSCI ESG Research
(3) DTS= duration times spread

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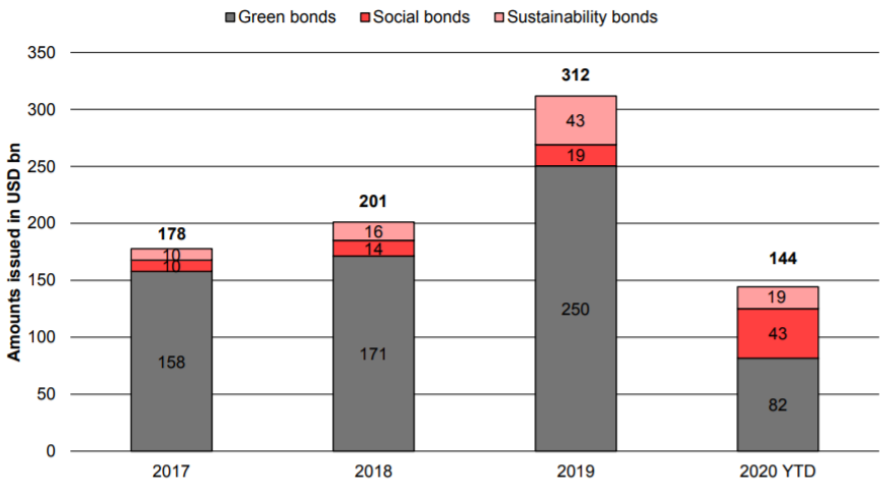
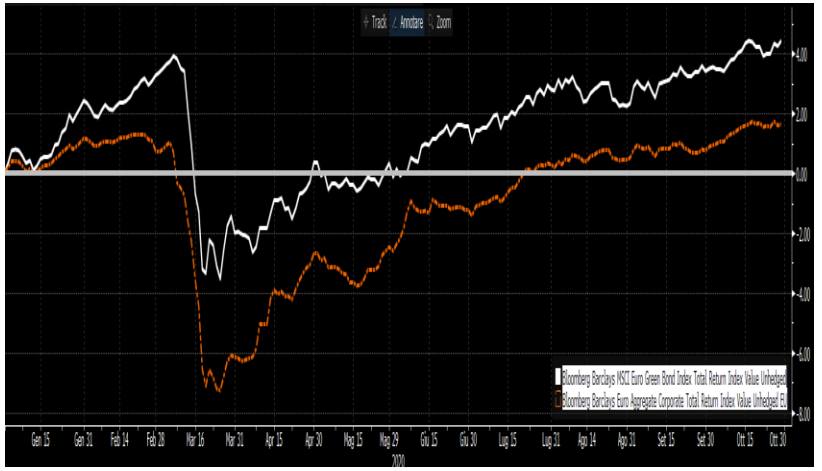
Covid, fixed income and ESG bond market

1. Growing issuance of social and sustainability bonds
   - Investors' attitude and public pressure
   - Sustainability linked bond principles
2. Green government bond issuance (+9% y/y) is 21.9 bn as of 1H2020
3. Green bond slowed the long-term upward trend at 1H2020
4. Green bonds proved more resilient during Covid outbreak

Issuance



Yields



Source: Climate Bond Initiative and Bloomberg

Thank you!

enrico.bernardini@bancaditalia.it

Sustainable fixed income - trends

1. Greenium: mixed evidence among issuers [1] (excess demand or risk perception or mispricing of standard bonds?)
2. Fragmentation in:
   - Taxonomy for green, climate and sustainable bonds
   - Second party review
3. Perspectives:
   - Challenges from sophistication in ESG data and instruments
   - Investors' appetite and greenwashing
   - Search for yield combined with societal objectives

transparency
and
comparability

(1) Gianfrate (2018) and Barclays (2015)