

Improving Sustainable Investing through Better ESG:

Insights from Research on Climate Risk and Finance

Nora Pankratz, Ph.D. | University of California, Los Angeles

June 17, 2021

Research Strategy

1. investigate financial outcomes
2. with
 - ▶ granular, large-scale spatial data from meteorologic sources
 - i.e. on extreme temperatures and floods
 - ▶ rigorous statistical methods for causal inference

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- financial incentives for adaptation

Current Research Projects



heat and workplace injuries

Behrer, Pankratz, Park (2020)

i.e. AEA/LERA'21, AEA/AERE'20

R&R Management Science

i.e. AEA'20, EFA'20

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R&R Management Science



heat, floods, and supply chains

Pankratz and Schiller (2019)

i.e. AEA'20, EFA'20

3 Insights for ESG Investing

(1) Incomplete knowledge of locations should not deter efforts to use GIS data.

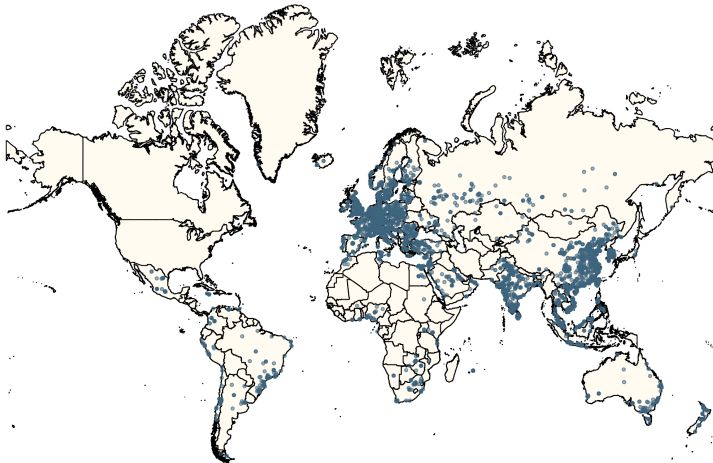
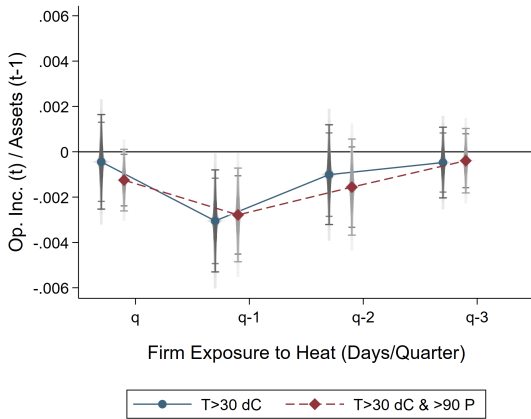
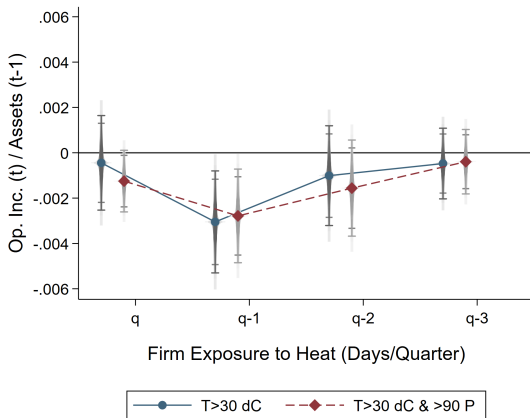


Figure: >13,000 firms with > 10% assets around headquarters
+ hot days/quarter + financial performance 1995-2019





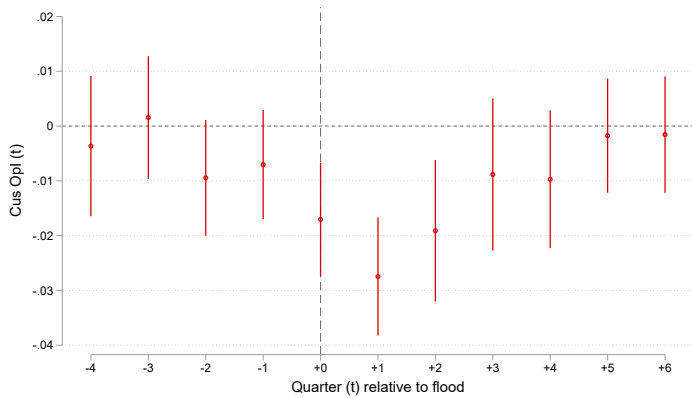
Without knowledge of complete sets of locations, we find that **heat exposure** (quasi-random variation over time) decreases **operating income/assets**.

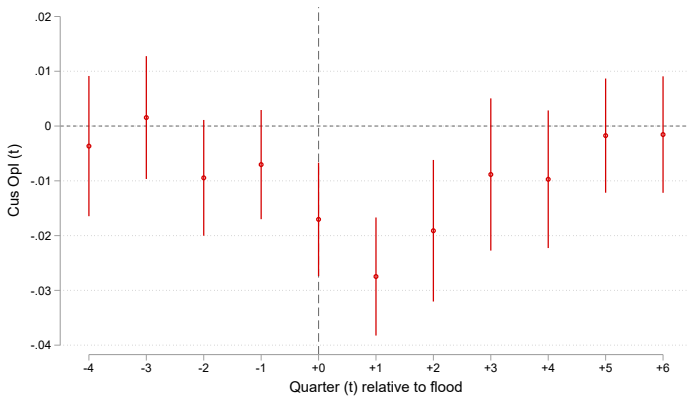
3 Insights for ESG Investing

(1) Incomplete knowledge of locations should not deter efforts to use GIS data.

3 Insights for ESG Investing

(2) Analyses beyond the boundary of the firm are important in an ESG context.





Quasi-random variation in [suppliers'](#) temperature and flood exposure decreases operating income/assets of corporate [customers](#).

3 Insights for ESG Investing

(2) Analyses beyond the boundary of the firm are important in an ESG context.

3 Insights for ESG Investing

- (3) Use of GIS data helps to assess what firms 'do', beyond what firms say they do –
i.e. pollution, workplace injuries, deforestation.



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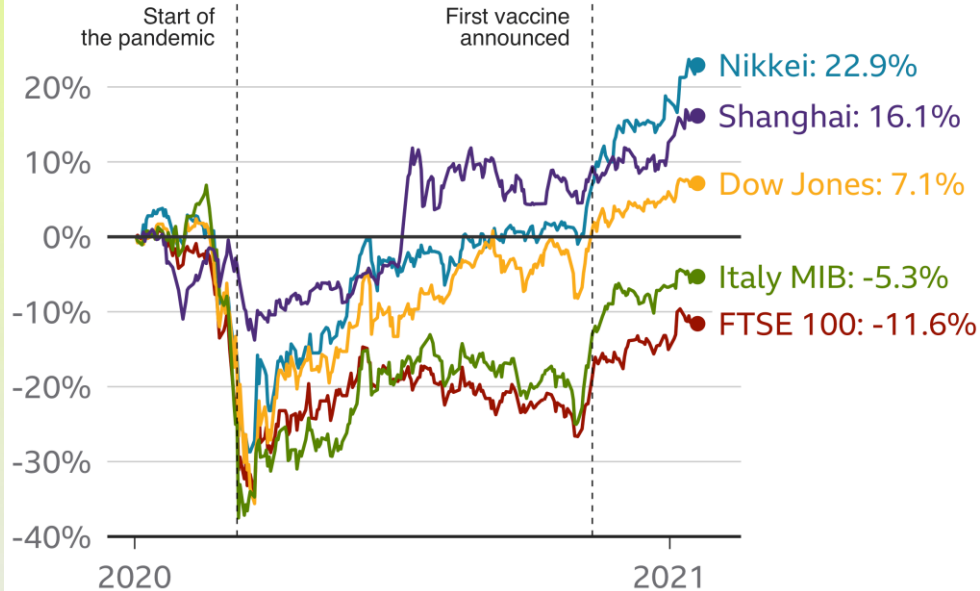
MAKING METRICS THAT MATTER. A 360 DATA SCIENCE APPROACH TO ESG INVESTING. DR. SUCHI GOPAL

IMPROVING SUSTAINABLE INVESTING THROUGH BETTER ESG METRICS.
BOSTON UNIVERSITY'S IMPACT MEASUREMENT & ALLOCATION PROGRAM
(IMAP), THE SUSILO INSTITUTE FOR ETHICS IN THE GLOBAL ECONOMY AT THE
QUESTROM SCHOOL OF BUSINESS, AND THE INSTITUTE FOR SUSTAINABLE
ENERGY. DATE TIME: JUN 17, 2021 11:00 AM



ESG IN THE NEWS

The impact of coronavirus on stock markets since the start of the outbreak



Source: Bloomberg, 24 January 2021, 00:01 GMT

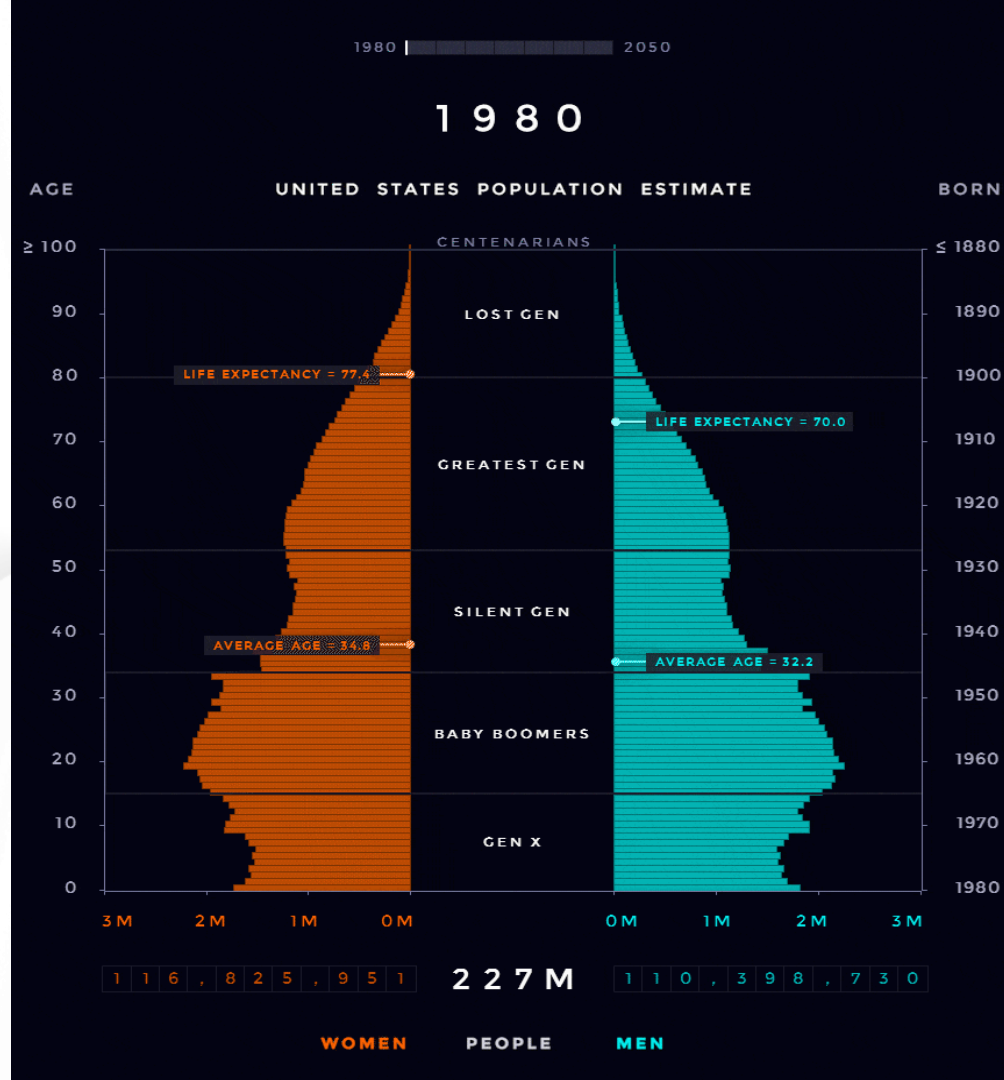
BBC



CHANGING DEMOGRAPHICS

BABY BOOMERS AND MILLENNIALS

- Changing demographics are driving new investment trends and socially-focused strategies
- This wealth will be distributed among different age cohorts, and is increasingly being driven by millennial investors.
- \$250 Billion (2021) – Impact Investing funds are now 20% of the total.
- 534 Index funds focused on Sustainability; 56% rank in top half of their Morningstar category



HOW SHOULD WE MEASURE ESG MATERIALITY?

- ▶ Companies use standards such as SASB, CDSB, and GRI to disclose their ESGs. Usual practice is to examine standard certification. (self-certification bias)
- ▶ We use a different approach. We estimate materiality themes such as biodiversity, gender, decarbonization, and climate vulnerability across the specific sector (technology, mining, paper, & transport). Get the equity's score in relation to its peers
- ▶ Emerging ESG rarely addressed – supply chain, gender pay gap, racial and social inclusion– need social media data and other published text reports
- ▶ ESG research needs some scientific R&D for some issues (water security or biodiversity, scope 3 emissions).

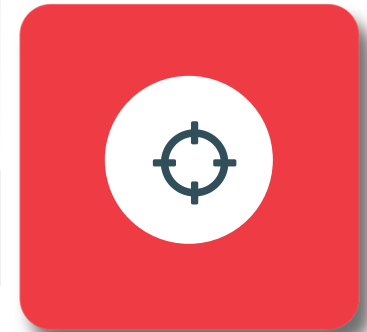
OUR PROCESS FOR MAPPING ESG MATERIALITY

Client Needs
ESG data, ESG
metric, ESG
Thematic Research

Collect & Integrate
Dynamic
Structured &
Unstructured data

Data Science &
Analysis
AI/ML, Adv.
Statistics

SaaS Dashboards/
ESG Thematic
Report –Risk
rating, or guide
investment themes



Our Process

- Unique & Proprietary Data Sources
- Cutting-Edge & Academically Derived Data Methods
- AI Identifies Trends, Unique Insights, and Makes Predictions
- Reports & Recommendations

Geospatial:
Satellites,
Drones, etc.

Examples:

Deep Social:
Social Media,
Census, Health

Data Feeds:
Internal,
Market, S&P

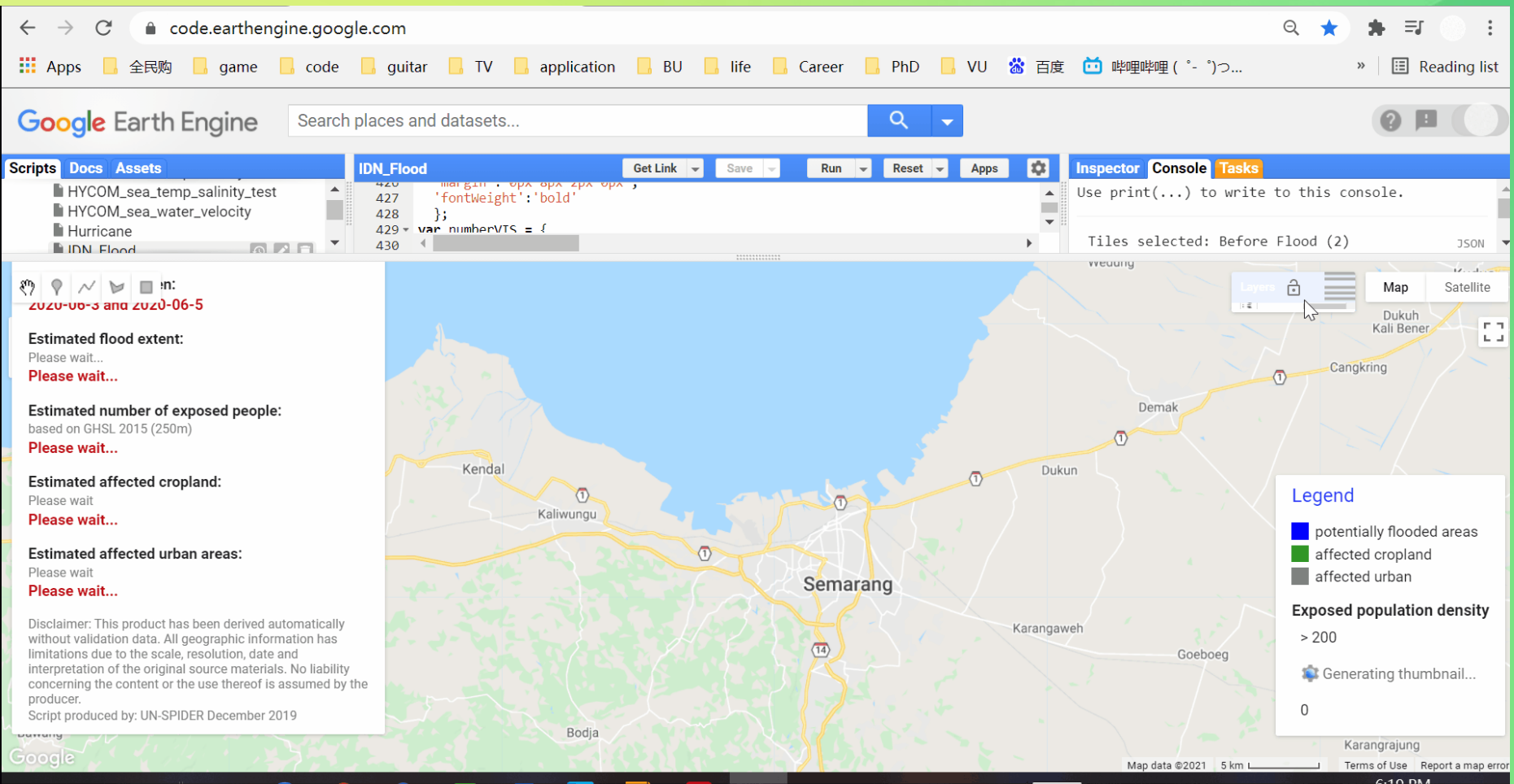
Harness 1000+ Data Sets and Over
10 Billion Data Points on ESG

ESG Materiality Estimates
in Different Equity Sectors
& Geographies

AI & ML Models
Data Validation

ESG
Insights

Data Processing – Satellite Data (Real Time Flooding)



ESG FILTERS (THEMES) METHODOLOGY - GENDER

Data Snapshot: March 2021

Color Coding

Attribute	an attribute of the row / Dimension
Measure	A Measure by row
Aggregate	Composed Metric

Content Mentions*

Field Name: Description

Company	The Public Operating Name of the Company
Ticker	Public Ticker Symbol
Date	Day of Mention
Country	Country of Mention
Description	Description of Specific Mention

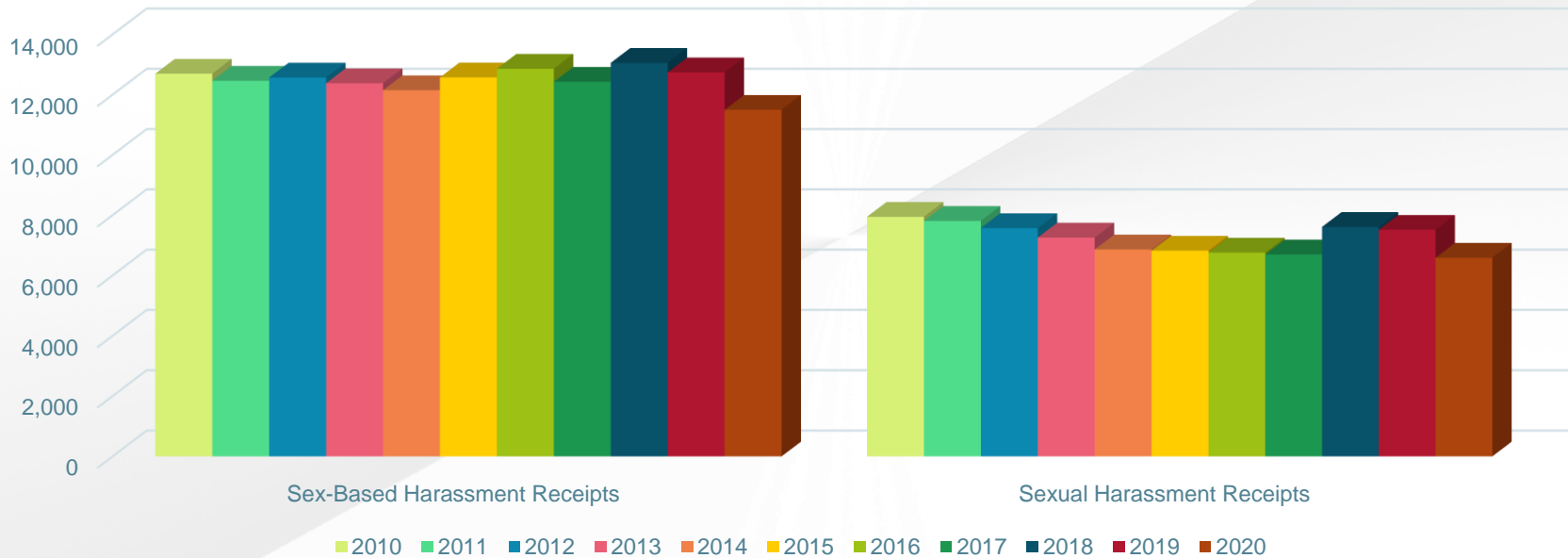
Social Mentions**

Field Name: Description

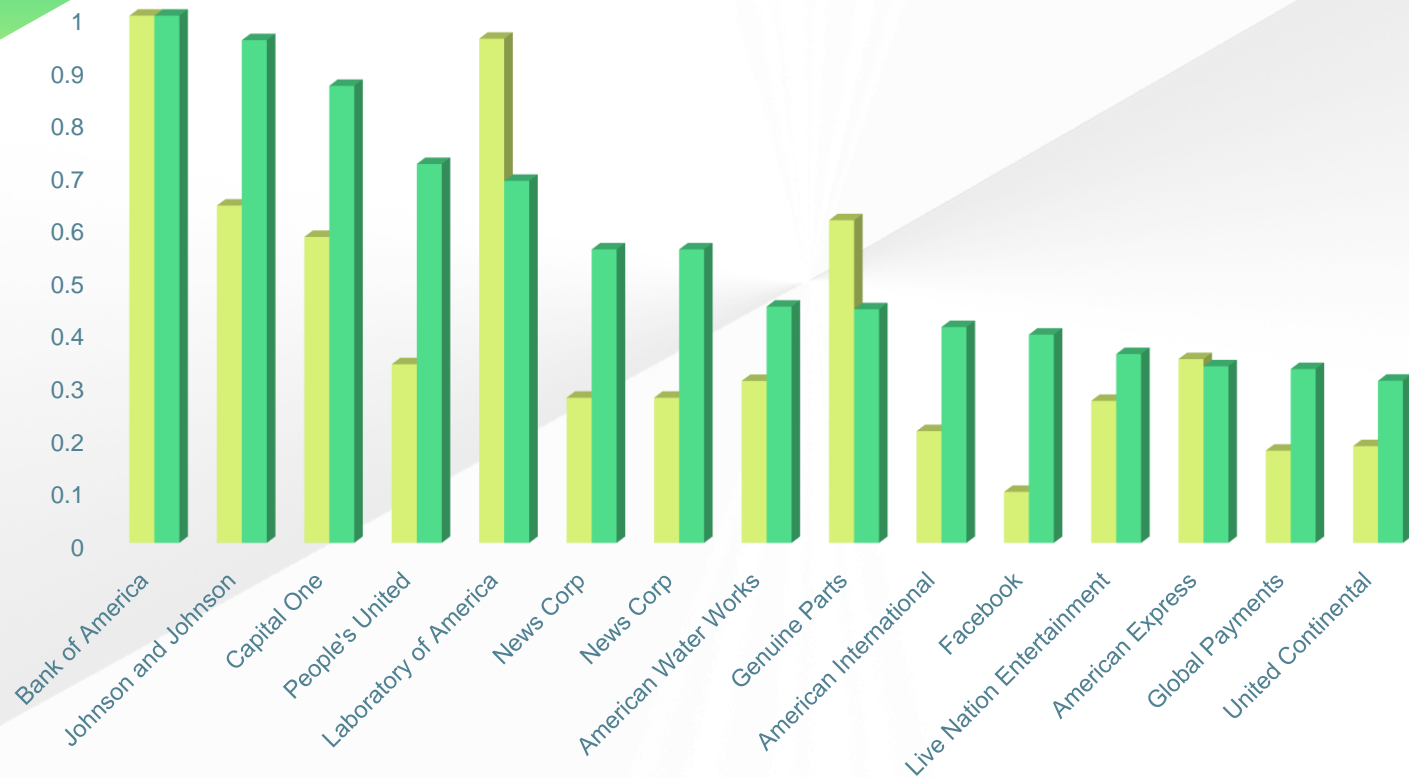
Company	The Public Operating Name of the Company
Ticker	Public Ticker Symbol
Web	Mention-Rate across non-news discussion and online sites
Twitter	Mention-Rate across Twitter (past 12 months)
YouTube	Mention-Rate across YouTube Videos; Includes video content, comments (past 12 months)
Facebook	Mention-Rate across Facebook; public pages and discussions (past 12 months)

* Content Mentions: Content Mentions are defined as discussions in direct context of "Sexual Harassment." An example would be a mention in The New York Times of a discrimination complaint against an executive at a business. ** Social Mentions: Social Mentions include consumer-driven discussions around the topic of Sexual Harassment. For example, this would include a discussion (informal complaint) of a sexual- or gender-based discrimination allegation.

EEOC Filing of Sexual Harassment (2010-2020)



Sexual Harassment and CEO - # Searches and #Social Mentions



ESG FILTERS (THEMES) FINAL SCORING

Company Group	Country Domicile	Sector	Subsector	Year	Total waste generation	Waste recovered	Recycled	Thermally recovered	Waste disposed of	In underground landfills	In surface landfills	Through incineration	Classification of waste for disposal	Non-hazardous waste	Hazardous waste	Transported hazardous waste
Royal Dutch Shell	United Kingdom	Energy	Oil, Gas & Coal	2019	2340	990	450	540	1350	190	380	780		430	920	280

Sector	Unadjusted GPG	Overall Explained Gap	Age	Education levels	Levels Occupation - ISCO-08	Job Experience	Employment Contract (full)	Working time	Economic Sector	Enterprise Size	Unadjusted Score
Metallurgy	14.2	-4.2	-0.5	-4.6	-2.2	-2.4	0.1	0.1	2.2	1.7	18.4
Electronics	22.5	3.8	-0.6	-0.1	-0.4	0	0.3	0.2	4.8	0	18.7

Company	River Basin	Country	area_km2	Baseline water stress	Baseline water depletion	Inter-annual variability	Seasonal variability	Ground-water table impact	Flood risk	Coastal flood risk	Drought risk	Untreated connected wastewater	Coastal eutrophication potential	Un-improved / no drinking water	Un-improved / no sanitation	Peak ESG risk index	Connected Index	Overall Water Score
Airbus	Scheldt	France	4273.244	Extremely High (>80%)	Low - Medium (5-25%)	Low - Medium (0.25-0.50)	Low (<0.33)	Insignificant trend	Low - Medium (1 in 1,000 to 2 in 1,000)	Low (0 to 9 in 1,000,000)	Medium (0.4-0.6)	Low (<30%)	High (1 to 5)	Low (<2.5%)	Low (<2.5%)	Low - Medium (25-50%)	Low (<30%)	Low - Medium (1-2)

Species Vulnerability (threatened, endangered, critically endangered)

Company Name	Location	Species Richness Impact	Mammals	Fish	Birds	Marine Fish	Sharks, Rays, Chimaeras	Amphibians	Proximity to Coasts (meter)	Proximity to Settlements (meter)	% Indigenous pop. with 25 K buffer	Weighted Risk Rank (0-100)
Royal Dutch C #1756		885	89	481	291	6	0	18	0km	0km	15%	78.00
Michelin	#2234	885	89	481	291	6	0	18	1km	1.76km	18%	68.00

ESGANALYTICS.AI PLATFORM (SAAS)

FUNDED BY BOSTON UNIVERSITY (R&D)

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ESGAnalytics.Ai was recognized by The Forrester New Wave™: Climate Risk Analytics, Q3 2020 as the leading provider of AI and advanced data analytics in this space. Our customers use this insight to make better investment and business decisions to stay ahead in a dynamic global system.

ESGAnalytics.Ai is a provider of extensive ESG data collections as well as composite materiality scores in ESG. Our customers use this insight to make better investment and business decisions to stay ahead in a dynamic global system.



Suchi Gopal

President & CEO

- Over 20 Years in AI and Data Science
- Proven Track Record in Geospatial Analytics
- AI Thought Leader



Joshua Pitts

CTO and Data Scientist

- 10+ years in Analytics and Software Engineering
- \$100MM+ Full Lifecycle Software Development and Project Management

Yingqiang Xu (Geospatial Analyst)

THANKS!

**Any questions? Pubs on the
website**

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