



European Economic
and Social Committee

AI & SUSTAINABILITY: A HUMAN –CENTRIC APPROACH

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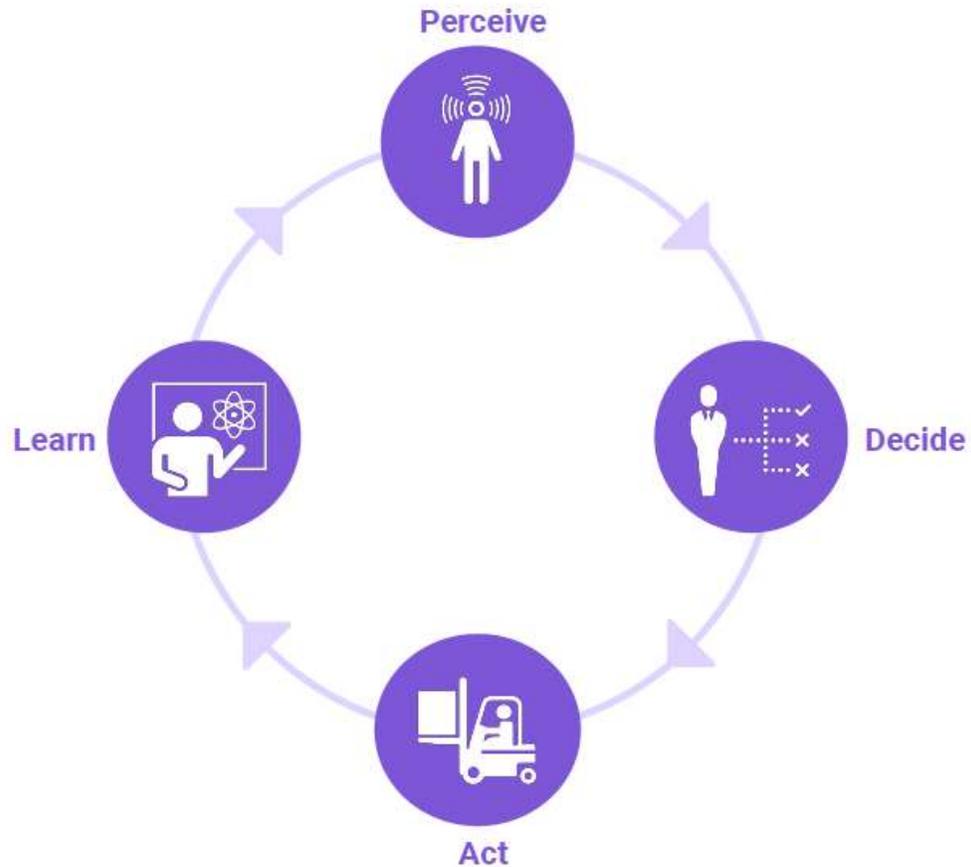
Previous experiences

- Professor Emlyon Business School (France)
- Professor Bocconi University (Italy)
- Visiting Scientists MIT Sloan Management (US)

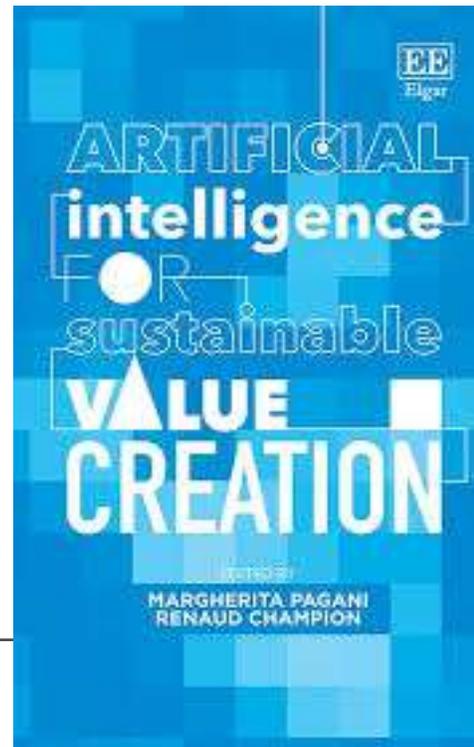
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Human-Centric AI



- **Human-Centric AI** combines technical capabilities like perception and reasoning with ethical considerations to empower and augment human abilities

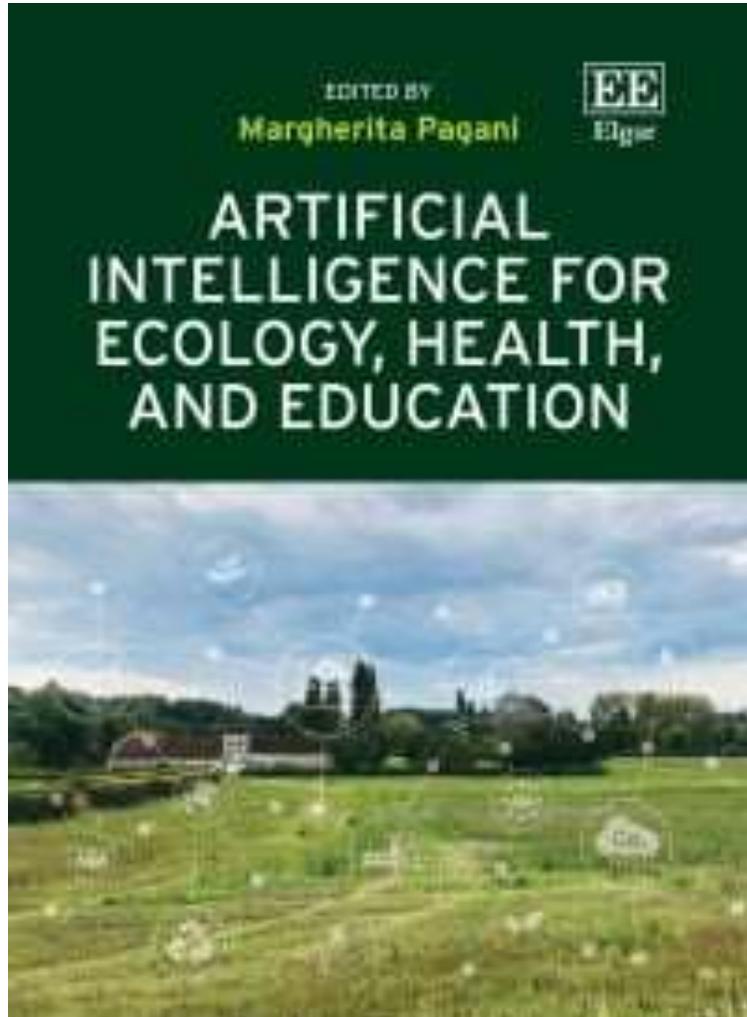


Artificial
Intelligence for
Business Creativity

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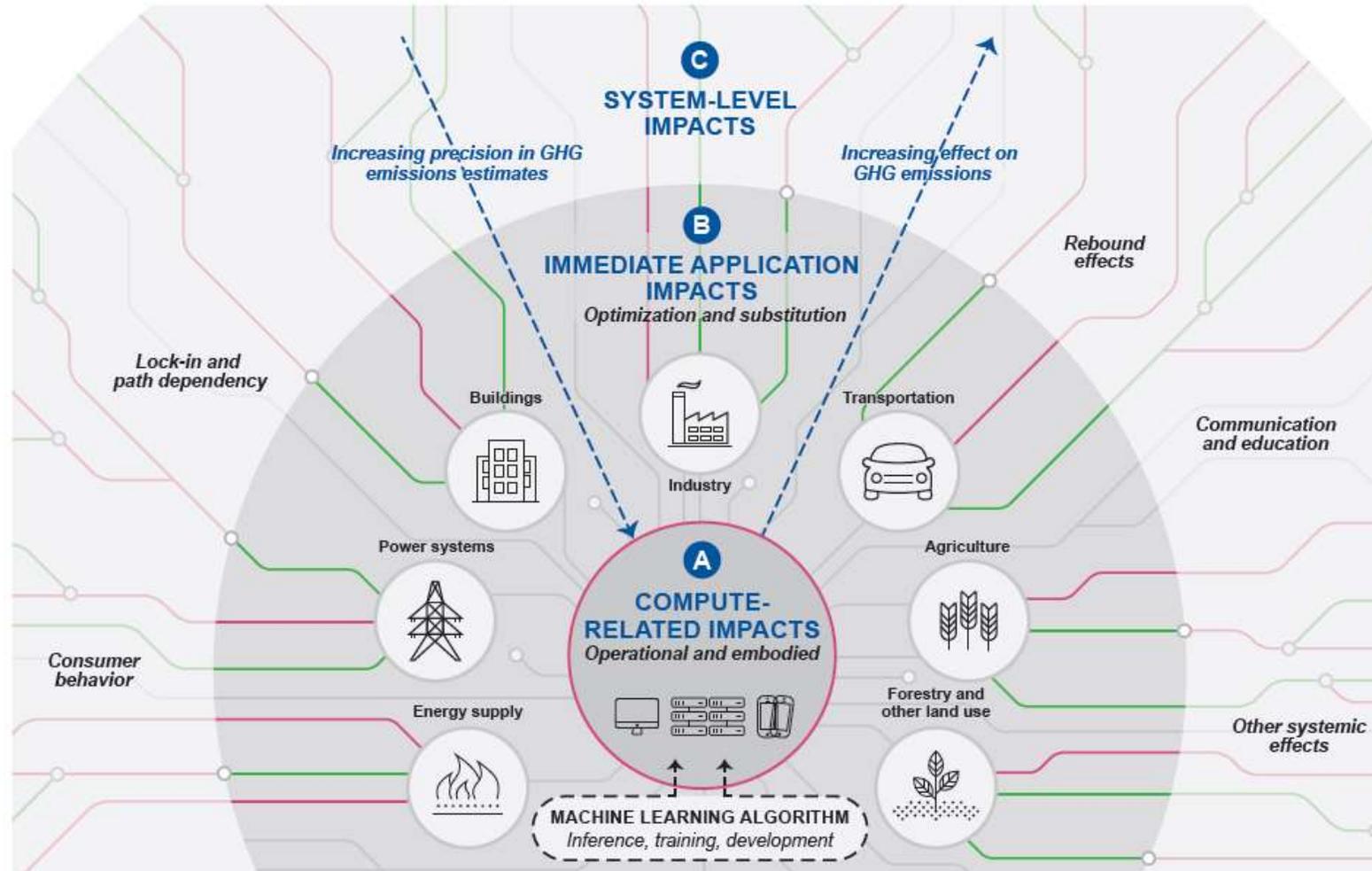


Societal Challenge: Aligning AI with Positive Impact



- 16 Contributors from 13 leading institutions in EU, US, Asia
- Upcoming book (August 2025 – Edward Elgar Publishing)

AI & Sustainability: Three Levels of Impact



(Kaack et al., 2022)

AI Integration & Business Success: Sustainability Perspective



Enablement Effect: AI enhances efficiency and supports sustainable practices.



Global Jevons Paradox: AI-driven efficiency may increase overall resource use.



Evidence Gap: Long-term effects of AI on sustainability remain uncertain.

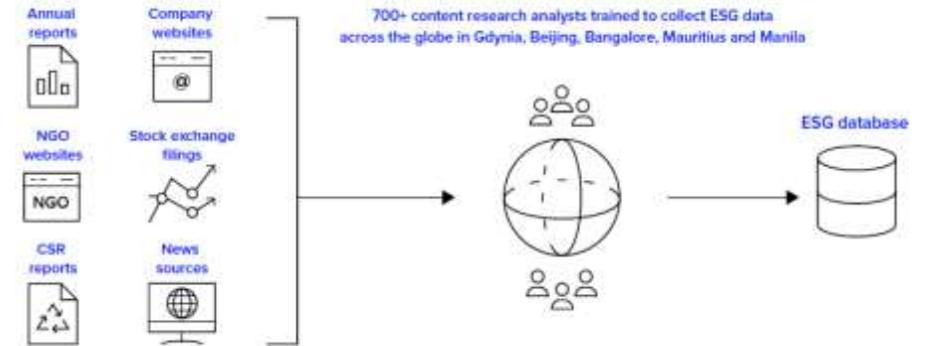
Research question



What is the relationship between a company's strategic AI focus and its environmental performance?

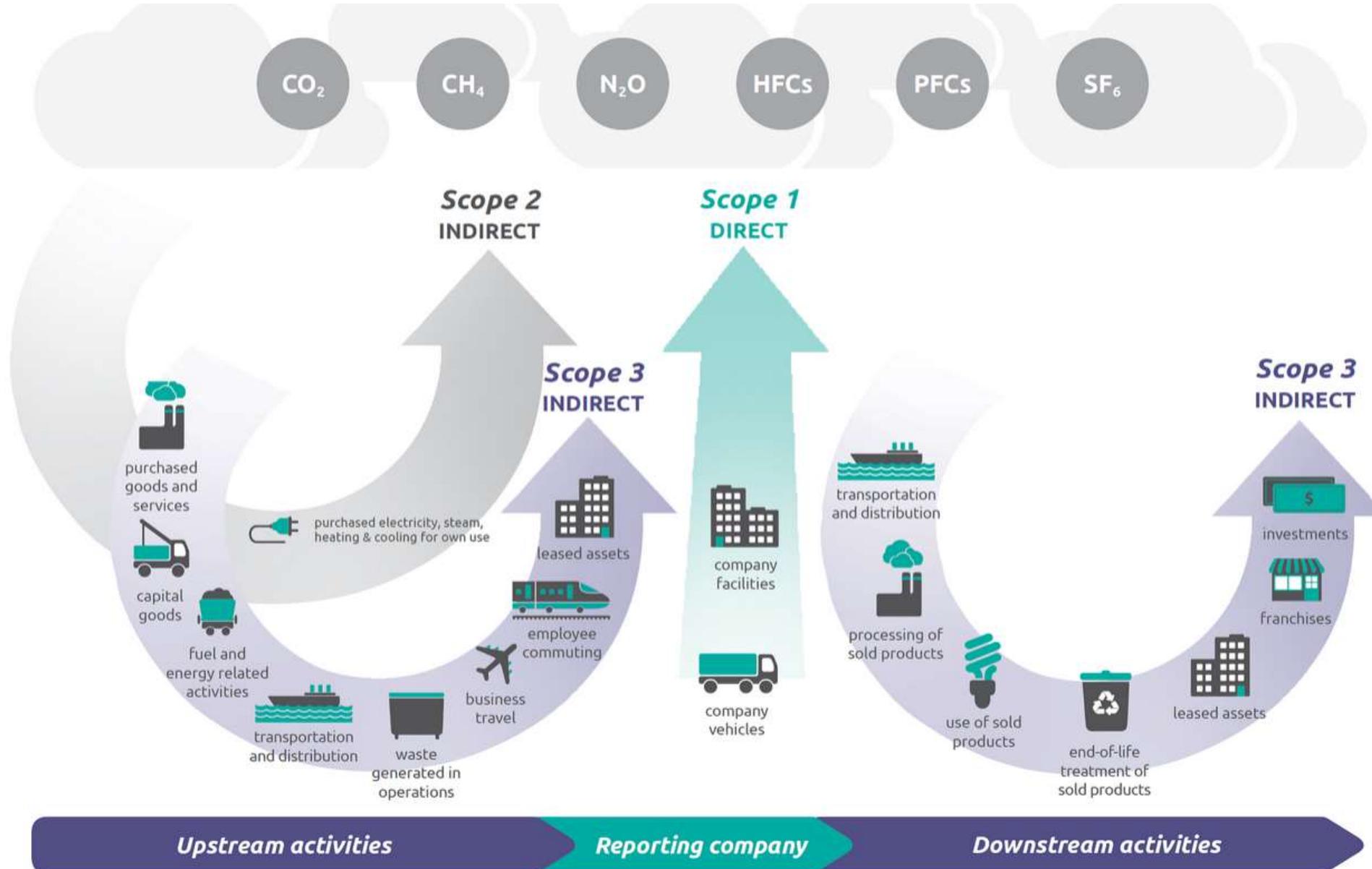
Link Between AI Focus and E(SG) Scores (N=3.071 companies in Refinitiv)

- **AI Focus:** Proportion of AI-related terms in annual reports
- **ESG Scores:** Commitment and Action compared to Industry Peers
 - **Resource Use**
 - **Emissions** (Scope 1, 2, 3 & other such as e-waste)
 - **Environmental Innovation**



Pillars	Categories	Themes
Environmental	Emission	Emissions
		Waste
		Biodiversity*
		Environmental management systems*
	Innovation	Product innovation
		Green revenues, research and development (R&D) and capital expenditures (CapEx)
	Resource use	Water
		Energy
		Sustainable packaging*
		Environmental supply chain*

Measured Emissions



Main Findings – Emissions (N=3071)

Explanatory variables	Outcome variables		
	Δ Emissions performance	Δ Resource use performance	Δ Environmental innovation performance
	Model 1	Model 2	Model 3
Δ Strategic AI focus	53.356* (24.917)	-747.423 (486.593)	2.271 (22.027)
Δ Lag Outcome	-0.013 (0.014)	-0.031† (0.017)	-0.051** (0.016)
Δ Firm size	0.339 (0.564)	-0.773 (0.590)	-0.272 (0.273)
Δ Firm indebtedness	-6.422** (1.847)	-0.014 (0.221)	-0.107 (0.193)
Δ Firm age	1.984 (1.285)	4.614 (3.405)	-0.391 (0.682)
Δ Firm profitability	-2.968* (1.420)	-0.547 (0.806)	0.407 (0.395)
Δ Firm capital expenditures	0.018** (0.006)	-0.009** (0.003)	-0.002† (0.001)
Constant	3.565*** (0.199)	4.560*** (0.486)	2.067*** (0.145)
Observations	6,925	3,629	8,335

- **Emissions:** Positive association with AI focus.
- **Resource Use:** No significant impact observed.
- **Environmental Innovation:** No significant impact observed.

Standard errors clustered at the firm level are in parenthesis. Levels of significance are indicated by †, *, **, and *** for 10, 5, 1 and 0.1%, respectively.

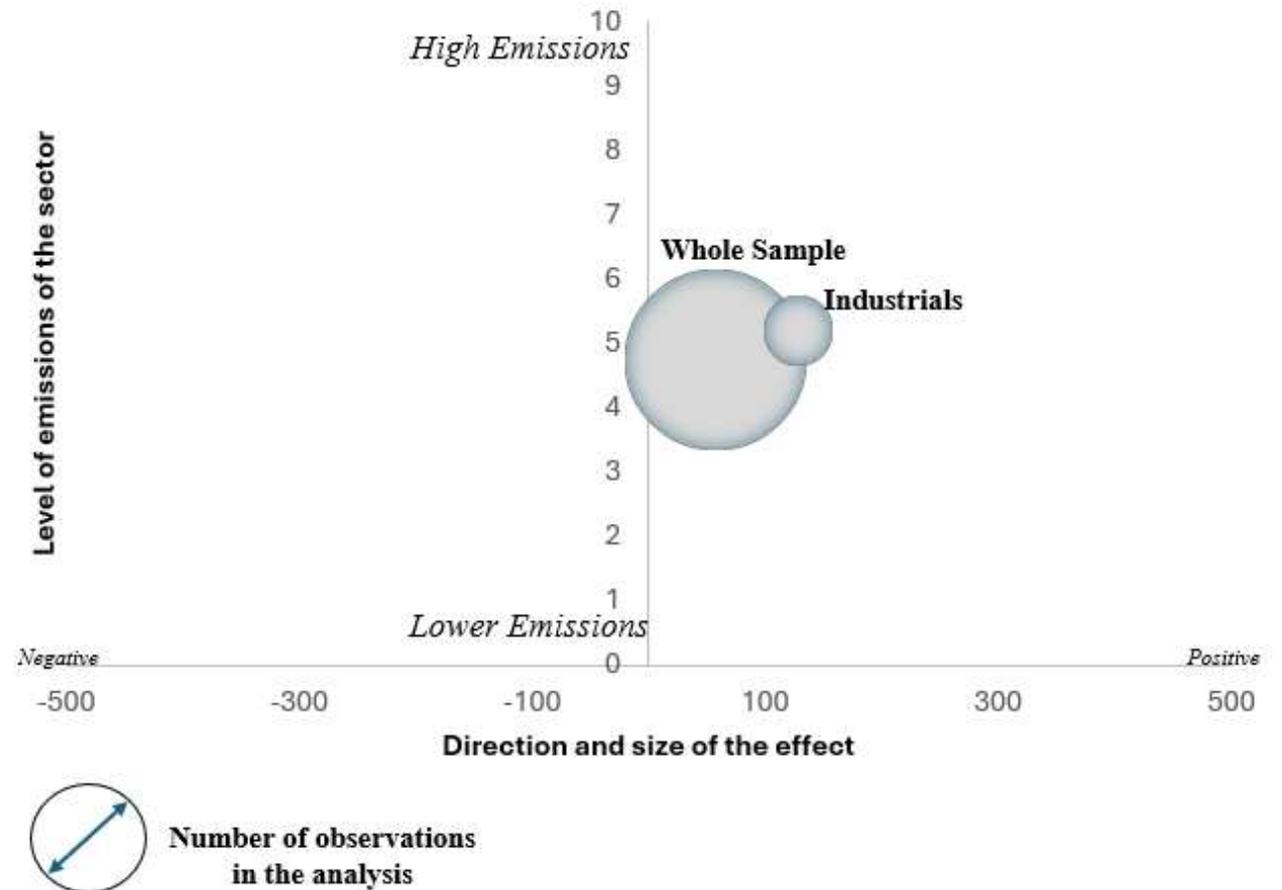
Categories Driving the Relationship between Strategic AI Focus and Emissions Score within “Industrials”

Business Sector	Industry Groups & Industries	Obs.	Emissions Performance
INDUSTRIAL & COMMERCIAL SERVICES	Professional & Commercial Services	300	245.352* (122.152)
	Business Support Services	138	496.841* (200.738)
INDUSTRIAL GOODS	Machinery, Tools, Heavy Vehicles, Trains & Ships	371	61.858 (58.209)
	Industrial Machinery & Equipment	195	239.907** (72.570)

Standard errors clustered at the firm level are in parenthesis. Levels of significance are indicated by †, *, **, and *** for 10, 5, 1 and 0.1%, respectively.

Association between AI focus and Emissions Score: sector analysis

- Positive association with **emissions score**; primarily in **industrial firms through efficiency gains**.
- No effect observed on resource use and environmental innovation performance



Setting emission targets

Explanatory variables	Outcome variable Emissions performance
Δ Strategic AI focus	63.371* (25.132)
Δ Strategic AI focus * Emissions Target	-64.774** (23.876)
Δ Emissions Target	17.727*** (0.870)
Δ Lag Outcome	-0.025* (0.012)
Δ Firm size	0.429 (0.404)
Δ Firm indebtedness	-3.125* (1.447)
Δ Firm age	2.103 (1.106)
Δ Firm profitability	-1.162 (1.053)
Δ Firm capital expenditures	0.009 (0.005)
Constant	2.789*** (0.172)
Observations	6,886

Standard errors clustered at the firm level are in parenthesis. Levels of significance are indicated by †, *, **, and *** for 10, 5, 1 and 0.1%, respectively.

Implications



strategic AI focus is positively associated with emissions performance, primarily in industrial firms



setting an emissions target negatively moderates this relationship



no significant impact is observed on resource use and environmental innovation performances

Thank you

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