

# One Hundred and Thirty Years of Corporate Responsibility

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September 4, 2024

# Motivation

1932  
Berle-Dodd debate

"What's the purpose of the public corporation?"



## Who Cares Wins

Connecting Financial Markets  
to a Changing World

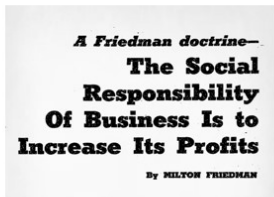
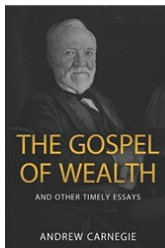
Recommendations by the financial industry to better integrate environmental, social and governance issues in analysis, asset management and securities brokerage

1889

1930

1970

2000



# Motivation

- ▶ Corporate responsibility is **not** a new concept
- ▶ But most studies in the literature confined to recent time periods ([Bolton and Kacperczyk, 2021; 2023](#); [Pastor, Stambaugh, and Taylor, 2022](#); [Dyck, Lins, Roth, and Wagner, 2019](#); [Liang and Renneboog, 2017](#); etc.)
- ▶ We do not understand which aspects of ESG become more pertinent issues to stakeholders at different points of time, why, and how that affects firms

# This Paper

- ▶ Natural Language Processing (NLP) to measure public attention to E&S issues throughout U.S. history in the last 130 years
- ▶ How has this measure evolved over time, and how is it correlated with socio/macroeconomic variables?
- ▶ How does exposure to this measure affect stock returns?
- ▶ How does public attention to E&S issues affect the level and efficiency of corporate investments in the short- and long-run?

## Preview of Results

- ▶ Corporate responsibility exists throughout history; varies in interesting patterns
  - ▶ Public attention to social issues increases at times of economic and social instability
  - ▶ Public attention to environmental issues increases at times of relative prosperity
- ▶ Limited ability of markets to price long-run real implications of the emphasis on corporate responsibility
- ▶ Public attention to corporate responsibility dampens corporate investment in the short-run, but benefits in the long-run

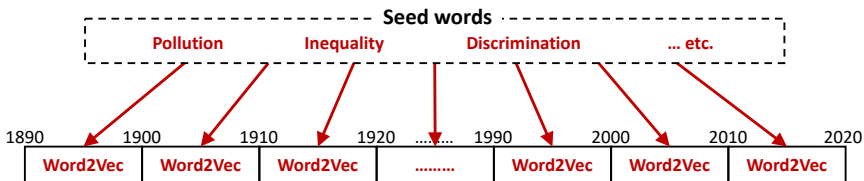
# Data

- ▶ Historical news articles
  - ▶ ProQuest TDM Studio
  - ▶ WSJ and NYT, 1890 to 2023
  - ▶ 4 million business news articles
- ▶ Historical macroeconomic variables
  - ▶ Real GDP growth rates and unemployment rates: the Jordá, Schularick, and Taylor (2016) Macrohistory database
  - ▶ NBER recession indicators: St. Louis Fed
  - ▶ Wealth inequality: Piketty, Saez, and Zucman (2018)
  - ▶ Political frictions: Poole and Rosenthal (1984); Azzimonti (2018)
  - ▶ Climate policy uncertainty: Gavriilidis (2021)
- ▶ Stock returns: CRSP, from 1926 onward
- ▶ Firm fundamentals: Compustat, from 1960 onward

# Methodology

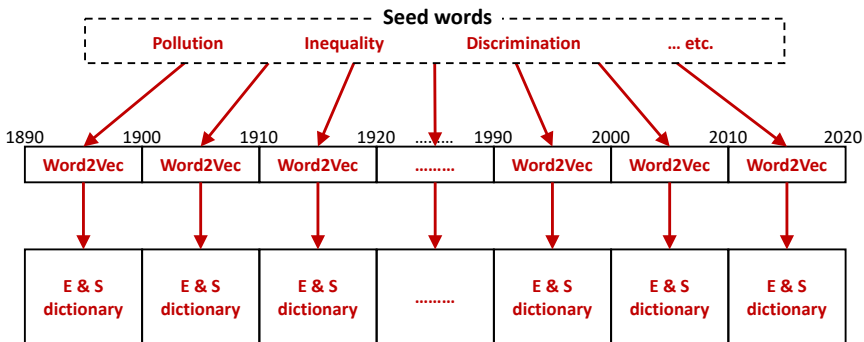


# Methodology

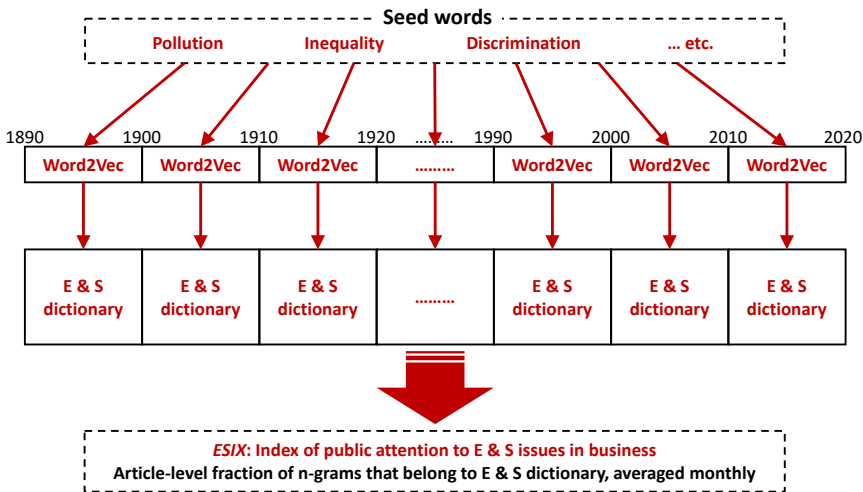




# Methodology



# Methodology



# Evolving Dictionaries

## Evolution of keywords related to "Pollution"

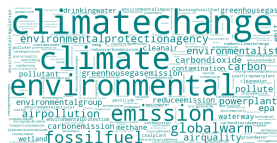
1920



1970



2020



## Evolution of keywords related to "Inequality" and "Discrimination"

1920



1970



2020

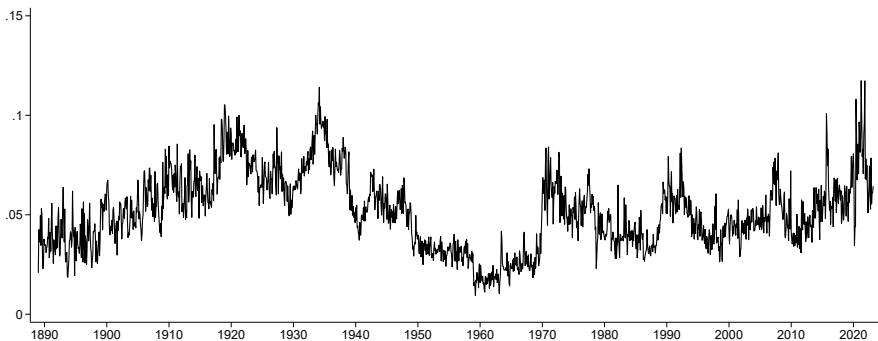


# ES-Index (ESIX)

Article-level share of n-grams belonging to E&S dictionary, averaged monthly

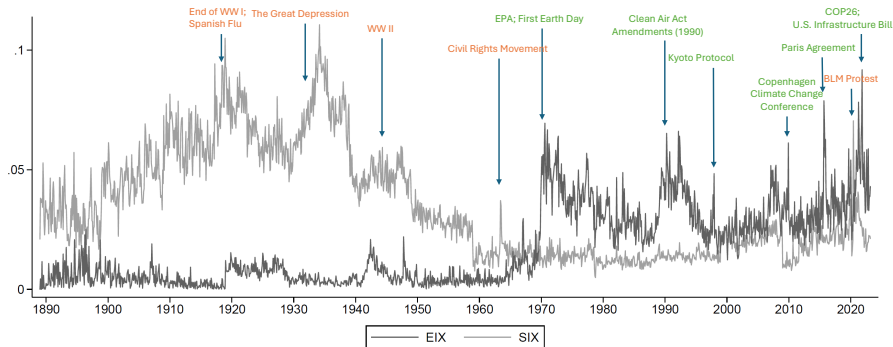
$$ESIX_t = \frac{1}{J} \sum_{j=1}^J \frac{\# \text{ E\&S n-grams}_{j,t}}{\# \text{ n-grams}_{j,t}}$$

computed using articles related to *“business”*, *“economy”*, or *“corporation”*

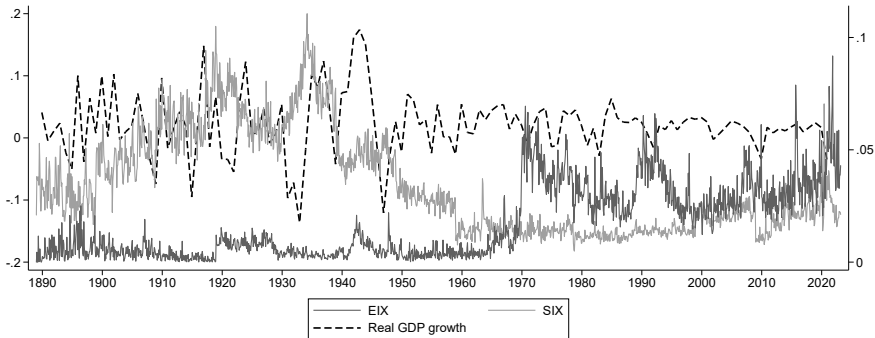


# Environmental (EIX) and Social (SIX) Components

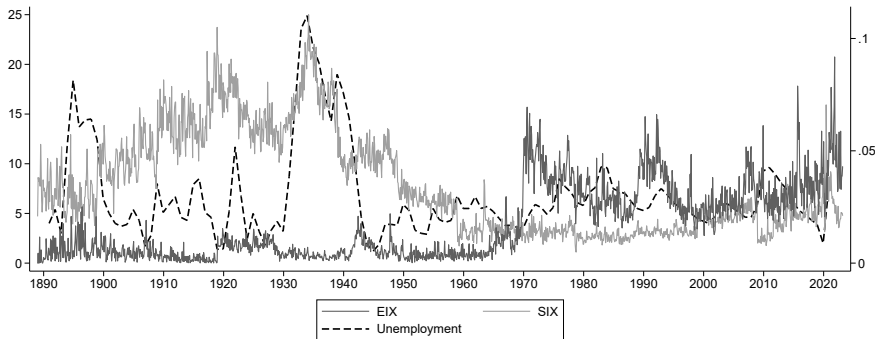
Peaks around notable historical events



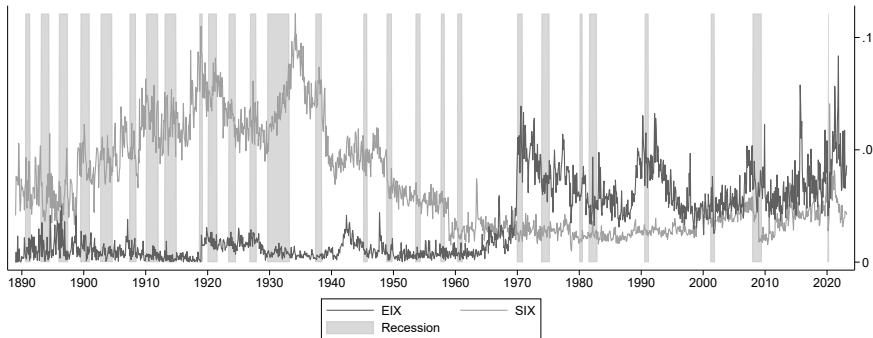
# GDP Growth



# Unemployment

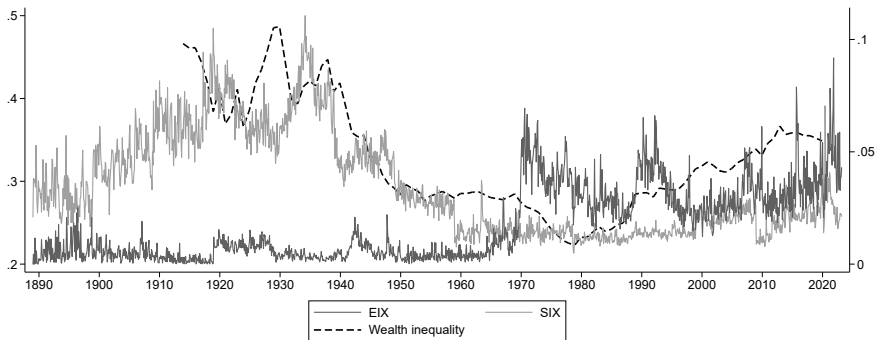


# Recessions





# Income Inequality



## Exposure to ESIX and Future Stock Returns

Stocks that have tended to do well amid high ESIX do not earn higher returns

- ▶ Five-year rolling-window factor regressions ( $\tau = t-60$  to  $t-1$ )

$$r_{i,\tau} - rf_{\tau} = \alpha_i + \beta_i \cdot \Delta ESIX_{\tau} + \gamma_i \cdot [rm_{\tau} - rf_{\tau}] + \delta_i \cdot SMB_{\tau} + \eta_i \cdot HML_{\tau} + \epsilon_{i,\tau}$$

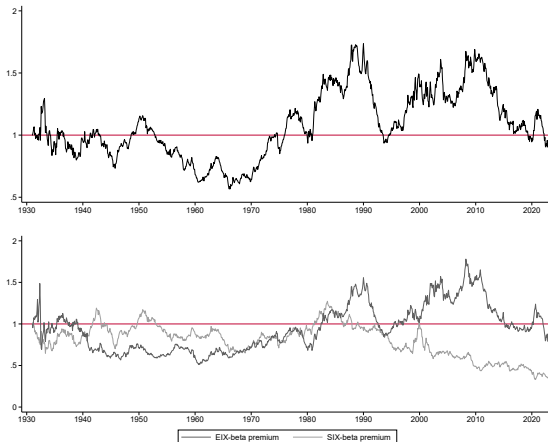
- ▶  $\beta_i$ : ESIX exposure for firm  $i$

$$r_{i,t} = \beta \cdot ESIX \text{ exposure}_{i,t-1} + \gamma' \cdot \mathbf{X}_{i,t-1} + \eta_i + \theta_t + \epsilon_{i,t}$$

	Dependent variable: Monthly stock return $_{i,t}$					
	Full sample period		Pre-1970		Post-1970	
	(1)	(2)	(3)	(4)	(5)	(6)
ESIX exposure $_{i,t-1}$	-0.002 (0.002)		-0.001 (0.003)		-0.002 (0.003)	
EIX exposure $_{i,t-1}$		-0.000 (0.003)		-0.063*** (0.018)		0.001 (0.003)
SIX exposure $_{i,t-1}$		-0.007*** (0.002)		0.001 (0.003)		-0.009*** (0.002)
Observations	1,817,883	1,817,883	246,322	246,322	1,571,559	1,571,559
Stock FE	Y	Y	Y	Y	Y	Y
Year-by-month FE	Y	Y	Y	Y	Y	Y
Stock controls	Y	Y	Y	Y	Y	Y
Adj R <sup>2</sup>	0.136	0.136	0.390	0.390	0.109	0.109

# Exposure to ESIX and Future Stock Returns

Cumulative return on high–low ESIX exposure portfolio rebalanced each month



# ESIX and Corporate Investments

- ▶ Do public concerns about environmental and social externalities have real effects on corporate investments?

$$\frac{Capex_{i,t}}{Assets_{i,t-1}} = \beta_1 \cdot ESIX_{t-1} + \beta_2 \cdot \Delta ESIX_{t-1} + \gamma' \cdot \mathbf{X}_{i,t-1} + \eta_i + \theta_{j,[t-10 \rightarrow t-1]} + \epsilon_{i,t} \quad (1)$$

- ▶  $\mathbf{X}$ : Tobin's  $q$ , ROA, long-term debt, firm size
- ▶  $\eta_i$ : firm fixed effects
- ▶  $\theta_{j,[t-10 \rightarrow t-1]}$ : industry-by-decade fixed effects

## ESIX and Corporate Investments

	Dependent variable: $\text{Capital expenditures}_t / \text{Assets}_{t-1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ESIX</i>	-0.085*** (0.025)				-0.081*** (0.025)	
$\Delta$ <i>ESIX</i>		-0.027* (0.017)			-0.018 (0.017)	
<i>EIX</i>			-0.098*** (0.029)			-0.096*** (0.030)
<i>SIX</i>			-0.015 (0.084)			-0.004 (0.090)
$\Delta$ <i>EIX</i>				-0.028* (0.017)		-0.015 (0.017)
$\Delta$ <i>SIX</i>				-0.026 (0.033)		-0.033 (0.036)
Observations	202,664	202,664	202,664	202,664	202,664	202,664
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Industry-by-decade FE	Y	Y	Y	Y	Y	Y
Adj R <sup>2</sup>	0.420	0.420	0.420	0.420	0.420	0.420

- ▶ Economic magnitude: one standard deviation increase in *ESIX* (0.02) is associated with 0.17 percentage point decrease in firm investment

# ESIX and Investment Efficiency

- ▶ Is higher ESIX associated with changes in investment efficiency?

$$\begin{aligned} \frac{Capex_{i,t}}{Assets_{i,t-1}} = & \beta_1 \cdot ESIX_{t-1} \times Tobin's\ q_{i,t-1} \\ & + \beta_2 \cdot \Delta ESIX_{t-1} \times Tobin's\ q_{i,t-1} \\ & + \gamma' \cdot \mathbf{X}_{i,t-1} + \eta_i + \theta_{j,t} + \epsilon_{i,t}, \end{aligned} \tag{2}$$

- ▶  $\mathbf{X}$ : Tobin's  $q$ , ROA, long-term debt, firm size
- ▶  $\eta_i$ : firm fixed effects
- ▶  $\theta_{j,t}$ : industry-by-year fixed effects

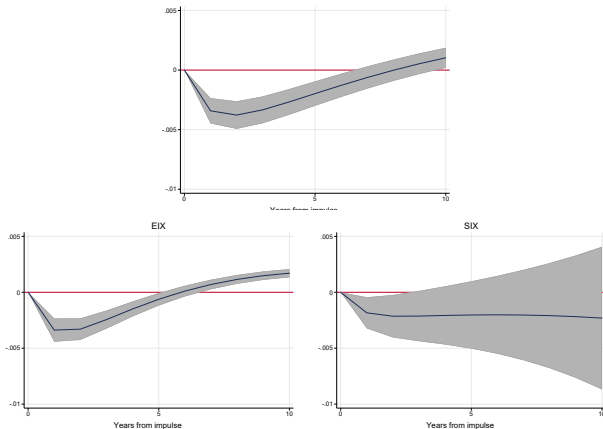
# ESIX and Investment Efficiency

	Dependent variable: Capital expenditures <sub>t</sub> /Assets <sub>t-1</sub>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ESIX</i> × Tobin's <i>q</i>	-0.085*** (0.018)				-0.070*** (0.018)	
$\Delta$ <i>ESIX</i> × Tobin's <i>q</i>		-0.073*** (0.027)			-0.058** (0.027)	
<i>EIX</i> × Tobin's <i>q</i>			0.072** (0.030)			0.094*** (0.032)
<i>SIX</i> × Tobin's <i>q</i>			-0.517*** (0.057)			-0.543*** (0.077)
$\Delta$ <i>EIX</i> × Tobin's <i>q</i>				-0.066** (0.026)		-0.057** (0.026)
$\Delta$ <i>SIX</i> × Tobin's <i>q</i>				-0.096** (0.040)		0.056 (0.055)
Tobin's <i>q</i>	0.018*** (0.001)	0.014*** (0.001)	0.021*** (0.001)	0.014*** (0.001)	0.017*** (0.001)	0.021*** (0.001)
Observations	202,657	202,657	202,657	202,657	202,657	202,657
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Industry-by-year FE	Y	Y	Y	Y	Y	Y
Adj R <sup>2</sup>	0.437	0.437	0.437	0.437	0.437	0.437

# ESIX and Short-/Long-Term Investment Dynamics

Level of investment initially declines, but ultimately recovers/improves long-run

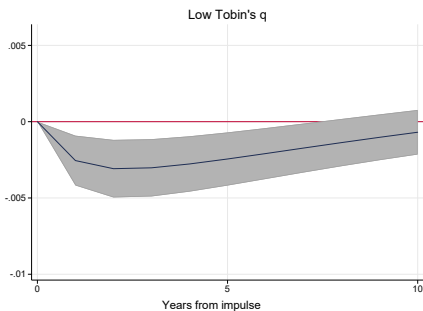
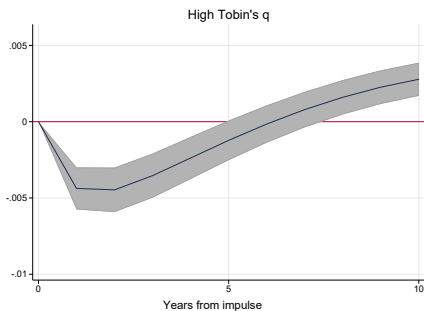
- ▶ Impulse responses from panel VARs estimated via GMM





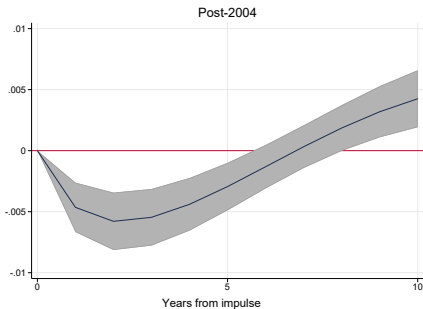
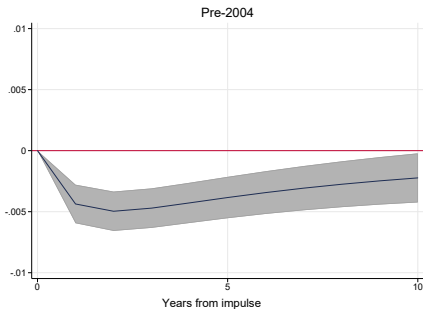
# ESIX and Short-/Long-Term Investment Dynamics

Efficiency of investment initially declines, but ultimately recovers/improves long-run (i.e., faster and sharper recoveries in investments by high- $q$  firms)



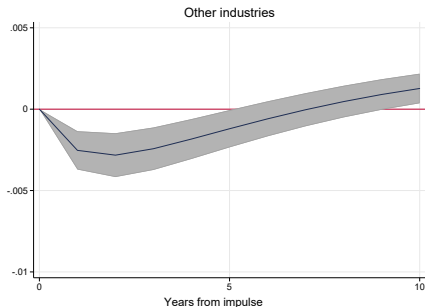
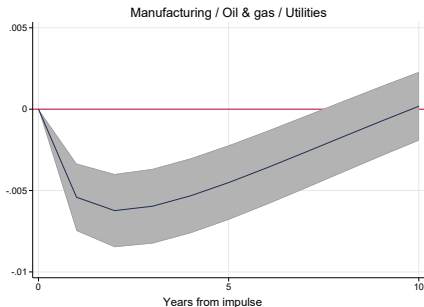
# ESIX and Short/Long-Term Investment Dynamics

Faster and sharper recoveries in investments after 2004 (i.e., post-ESG era)



# ESIX and Short-/Long-Term Investment Dynamics

Initial decline stronger and recovery slower for firms in emission-intensive sectors



# Conclusion

- ▶ Create long-run historical ESIX (1890 to present) to capture public attention to environmental and social issues related to business
  - ▶ SIX: arise during times of internal economic and social instability
  - ▶ EIX: increase during times of relative prosperity
- ▶ Demonstrate how we can apply ESIX in asset pricing
  - ▶ Limited ability of markets to price long-run real implications of the emphasis on corporate responsibility
- ▶ Relate ESIX to corporate investment
  - ▶ Heightened public attention dampens investment in the short-run, but enhances it in the long-run

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