

ESG Performance and Firm Productivity: Evidence from South Korea

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C O N T E N T S



Part 1. Motivation

Part 2. Data and Methodology

Part 3. Findings and Discussions

Part 1

How does ESG ratings affect Productivity

KPI

Non-fundamental ESG

E

Environmental strategy, structure, management, performance, and response to stakeholders

S

Employee protection, competition and acquaintances, consumer protection, and regional community facilitation

G

Shareholder rights, board of directors quality, audit, and transparency

Motivation Behind ESG Efforts

- Consumers
 - Recent abnormalities in weather conditions around the world
 - How corporations treat their employees (wrongful termination, coercion, etc.)
- Investors
 - UN's Principles for Responsible Investment
 - Preference for ESG-friendly assets
 - Risk management (sustainability)
 - Less financial friction

High ESG
Performance

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graph LR; A[High ESG Performance] --> B[Represents better work environments  
Socially and environmentally responsible  
Firm is operated with competent management]; B --> C[Labor Productivity  
Higher quality workers want to work for this firm  
More able to headhunt]; B --> D[Total Factor Productivity  
With more access to finance, firms will invest in innovation and technology];
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- Represents better work environments
- Socially and environmentally responsible
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Labor Productivity

Higher quality workers want to work for this firm

More able to headhunt

Total Factor Productivity

With more access to finance, firms will invest in innovation and technology

- Labor productivity
 - Barrymore and Sampson (2021)
 - Fonseca and Van (2022)
- Total factor productivity
 - Deng, Li, and Ren (2023)
 - Luo, Wei, and He (2023)

Part 2

Data and Methodology

KPI

ESG Scores

- ESG ratings and scores are obtained from Korea Corporate Governance Service (KCGS)
- E : environmental strategy, structure, management, performance, and response to stakeholders
- S : employee protection, competition and acquaintances, consumer protection, and regional community facilitation
- G: shareholder rights, board of directors quality, audit, and transparency

- In 2021, 1,009 firms were rated by KCGS, but only 940 were public
- Data ranges from 2011 to 2021 for ESG

- ESG score ranges from 0 to 7
- G score ranges from 0 to 100

Productivity Measures

- **Total Factor Productivity**
 - Akerberg, Caves, and Frazer (2015) control for the unobserved productivity shock and endogeneity issues by using an intermediate input
 - Generally, energy or materials
 - Levinsohn and Petrin (2003) use a similar method
- **Labor Productivity**
 - Total Sales / Labor Cost
 - Total Sales / # of Employees
- **Control Variables**
 - Herfindahl index, capital intensity, size, book to market ratio, leverage, and profitability

Empirical Specification

$$Productivity_{i,t} = \alpha + \beta_1 ESG_{i,t} + \gamma Controls_{i,t} + \delta_i + \theta_t + \varepsilon_{i,t}$$

- Productivity is TFP and Labor Productivity
- ESG is the quantified ESG rating that ranges from 0 to 7
- Fixed-effect and year-effect are included
- Endogeneity issue: IV method
 - The average of industry ESG score (Benlemlih, 2019)


Part 3

Findings and Discussions

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Total Factor Productivity

VARIABLES	ESG TFP	G Only TFP
ESG Score	-0.039 (-1.51)	
G Score		0.007* (1.92)
Constant	3.534*** (54.75)	3.044*** (21.30)
Observations	8,074	16,100
R-squared	0.17	0.16
Firm Fixed Effect	Yes	Yes
Time Effect	Yes	Yes
Controls	Yes	Yes
Number of Firms	1,054	1,608

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- By size
 - No significance
 - By ESG performance improvements
 - No significance
 - By industry
 - Only few industries showed significance but the sign was not consistent

Labor Productivity

	ESG	G Only
VARIABLES	Labor Productivity	Labor Productivity
ESG Score	3.478**	
	(2.38)	
G Score		0.811***
		(4.20)
Constant	-101.153***	-123.740***
	(-4.93)	(-9.37)
Observations	8,065	16,023
R-squared	0.08	0.1
Firm Fixed Effect	Yes	Yes
Time Effect	Yes	Yes
Controls	Yes	Yes
Number of Firms	1,049	1,593

Potential Determinant

- Financial constraint
- Whited and Wu's (2006) financial constraint measure is constructed (WW)
- WW is divided into quartile
 - Firms in the lowest quarter are financially unconstrained
 - Firms in the highest quarter are financially constrained

	Unconstrained	Unconstrained	Constrained	Constrained
VARIABLES	Labor Productivity	Labor Productivity	Labor Productivity	Labor Productivity
ESG Score	5.203**		-2.469	
	(2.55)		(-0.58)	
G Score		0.646**		-0.362
		(2.29)		(-1.01)
Constant	-169.295***	-211.733***	206.383	-29.583
	(-4.70)	(-7.44)	(1.01)	(-0.97)
Observations	4,776	6,523	1,421	5,141
R-squared	0.03	0.05	0.07	0.13
Firm Fixed Effect	Yes	Yes	Yes	Yes
Time Effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Number of Firms	737	845	365	979

Conclusion

1. ESG affects firm productivity through the labor market (Short-run)
2. Financial constraint affects the relationship between ESG and labor productivity
 - Already financially constrained firms do not benefit from higher ESG performance while unconstrained firms do

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