ESG Shocks in Global Supply Chains

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May 24, 2023

ESG Challenges in Global Supply Chains

Amazon workers strike in the US and 30 other countries on Black Friday in global 'Make Amazon Pay' campaign

Hayley Cuccinello Nov 26, 2022, 1:50 AM

An Amazon Warehouse worker participates in a protest in New Delhi, Friday, Nov. 25, 2022 AP Photo/Manish Swarup

ESG Challenges in Global Supply Chains

Costco Shareholder Vote Signals Focus on Supply-Chain Emissions

A Costco Wholesale store in Austin, Texas. The company said it takes climate change seriously and has a climate plan.

PHOTO: JOE RAEDLE/GETTY IMAGES

Multinational Firms' Responses: Engagement

STAKEHOLDERS ENGAGEMENT

Corporate Governance

- Statement of the Management
- Letter from Chief Sustainability Officer
- Board of Directors
- ESG Committee
- Human Rights and a High Standard of Professional Ethics
- Integrity Management
- Risk Management
- Privacy protection and information security risk management

Employee Care

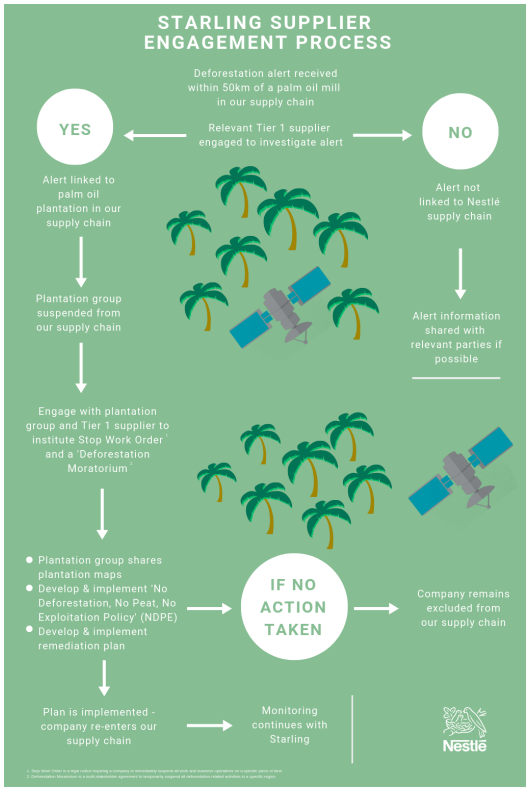
- Overview of Human Resource Structure
- Employee Health
- Talent Cultivation and Development
- Salary and Benefits

Sustainable Supply Chain

Suppliers are a vital factor for the continued success of HTC, we were founded in Taiwan and are a Taiwanese company whose operations and procurement drives the development of the related sectors. Besides key components, we try to purchase local raw materials and related equipment. The amount of local raw materials purchased accounted for 62.88%. While demanding high-quality services and products, we also use high ethical and environmental standards to manage our supply chain.

HTC requires all suppliers to maintain the same standard of corporate responsibility and announces the "Modern Slavery Act Transparency Statement" . We collaborate with suppliers to abide by the latest statement to embody justice and human rights.

HTC follow the Responsible Business Alliance Code of Conduct and formulated an "HTC Supplier Code of Conduct ", which aims to protect the environment with our supply chain partners, safeguard the human rights of our workers, their ethics, safety and health, and extend this social responsibility to the supply chain system. And organize irregular supplier meetings every year to promote relevant topics.



Multinational Firms' Responses: Exit

Indonesia: Nestlé and Pepsi cut ties with Indofood due to labour and environment concerns

Read more

"Major brands break ties with Indonesia palm oil giant," 05 October 2018

Nestlé and PepsiCo, both long time business partners of Indofood, have ended direct and indirect sourcing of palm oil from IndoAgri...due to concerns over ongoing deforestation and human rights abuses within its operations.

In an updated statement on its palm oil policy in Indonesia, PepsiCo said that it has decided to suspend sourcing palm oil from IndoAgri to its joint venture with Indofood, "pending further progress and visibility" around allegations of labour violations on its plantations. PepsiCo remains in business with the company under Indofood Fritolay Makamur (IFL)...

Multinational Firms' Responses: Exit

Canada terminates $222M PPE contract following forced labour probe

U.S. authorities banned disposable gloves manufactured by Supermax in Malaysia on Oct. 21

Janyce McGregor · CBC News · Posted: Jan 18, 2022 7:25 PM ET | Last Updated: January 19

Research Questions

- International trade cuts involve substantial costs
  - Finding new suppliers, re-optimizing shipping and production processes, setting up payment systems
- Do customers systematically cut trade after their suppliers are involved in ESG incidents?
  - Does the anecdotal evidence apply to a broad set of firms?
- What motivates these trade cuts?
  - Do they reflect purely monetary incentives?
    - E.g., supplier's business risk, risk of regulatory penalties
  - Do they reflect the non-monetary (ESG) preferences of some stakeholders?
    - E.g., ESG-conscious investors
    - If so, why exit and not engage?

What We Do

- Match data on
  - International suppliers' environmental and social (E&S) incidents
  - Universe of maritime imports by U.S. firms
- Study trade changes around supplier E&S incidents in stacked difference in differences setting
  - Baseline results with container imports as outcome variable
  - Cross-sectional tests on
    - Incident characteristics
    - U.S. importers' investor and end-consumer preferences
    - Supplier characteristics and switching costs
  - Supplier reallocation tests
  - Long-run analysis

What We Find

- Systematic evidence of trade cuts after supplier E&S incidents:
  - Imports decrease by 11.1%
  - Relationships 4.2% more likely to be terminated
- Reallocation to suppliers in other countries, with high ESG ratings
- Larger trade cuts for
  - Incidents with stronger externalities, periods of higher awareness
  - Customers with ESG-minded investors (*for the same incident*)
- Novel governance by exit mechanism:
  - Results stronger for small, private suppliers
  - Suppliers improve ESG ratings after trade cuts
  - Trade cuts and rating improvements lead to trade resumption

Our results suggest that firms take costly actions to meet non-monetary preferences of investors

Literature Review

- E&S in supply chains (Schiller, 2018; Pankratz and Schiller, 2019; Dai, Liang, and Ng, 2020; Ben-David, Jang, Kleimeier, and Viehs, 2021; Dai, Duan, Liang, and Ng, 2022; Koenig and Poncet, 2022)
  - Document (partial) trade cuts in a broad sample of firms
  - Study reallocation
  - Provide evidence of governance by exit
- Institutional investors and portfolio firms' E&S (Krueger, Sautner, and Starks, 2020; Azar, Duro, Kadach, and Ormazabal, 2021; Gantchev, Giannetti, and Li, 2022)
  - Study real effects on trade
  - Provide evidence on monetary costs of non-monetary preferences

Empirical Setting

Data: Supplier-Customer Relationships

- Universe of ocean freight shipments between foreign suppliers and U.S. customers from S&P Panjiva
  - Title 19 of the U.S. Code of Federal Regulation requires consignees to report shipment details to the Customs and Border Protection
  - Data includes information about shippers, consignees, product codes/descriptions, and container specifications
  - Sample period: 2007-2020
- Matched to Compustat at the U.S. customer-level
  - 7,032 publicly-listed U.S. customers
  - Suppliers from 211 countries
  - 44.32 (5) suppliers for the average (median) U.S. customer

Data: Environmental and Social (E&S) Incidents

- RepRisk collects ESG-related incidents by screening media, regulatory, and commercial documents
  - Environmental incidents: pollution, ecosystems and landscapes, overuse and wasting of resources, and animal mistreatment
  - Social incidents: community relations (e.g., human rights abuses) and employee relations (e.g., forced or child labor)
  - Governance incidents: corruption, bribery, fraud, tax evasion and optimization, and anti-competitive practices (...)
- We focus on E&S incidents during 2010-2018
  - E&S incidents more likely subject to negative externalities and downstream reputational effects
- We link Panjiva suppliers to RepRisk incidents using fuzzy name matching

Supplier E&S Incidents Matter for Customers' Value

Panel A: Entire RepRisk Sample

	Obs.	Mean (%)	Median (%)	*t*-stat: Mean = 0
CAR [-1,+1]	9,957	-0.10%	-0.08%	-2.79
CAR [-3,+3]	9,957	-0.19%	-0.08%	-2.79
CAR [-5,+5]	9,957	-0.19%	-0.07%	-2.47

Panel B: Within-sample Incidents

	Obs.	Mean (%)	Median (%)	*t*-stat: Mean = 0
CAR [-1,+1]	1,057	-0.15%	-0.02%	-1.38
CAR [-3,+3]	1,057	-0.27%	-0.01%	-1.71
CAR [-5,+5]	1,057	-0.46%	-0.20%	-2.39

- Supplier incidents trigger negative CARs in customers' stocks
  - Current evidence suggests negative cash flow effects from reallocation costs and lower sales
  - No evidence of institutional investors' exit

In-Sample Anecdotal Evidence: Deckers and Stella

EMERGING MARKETS MARCH 11, 2015 / 2:30 PM / UPDATED 8 YEARS AGO

Chinese shoe factory workers strike over benefits

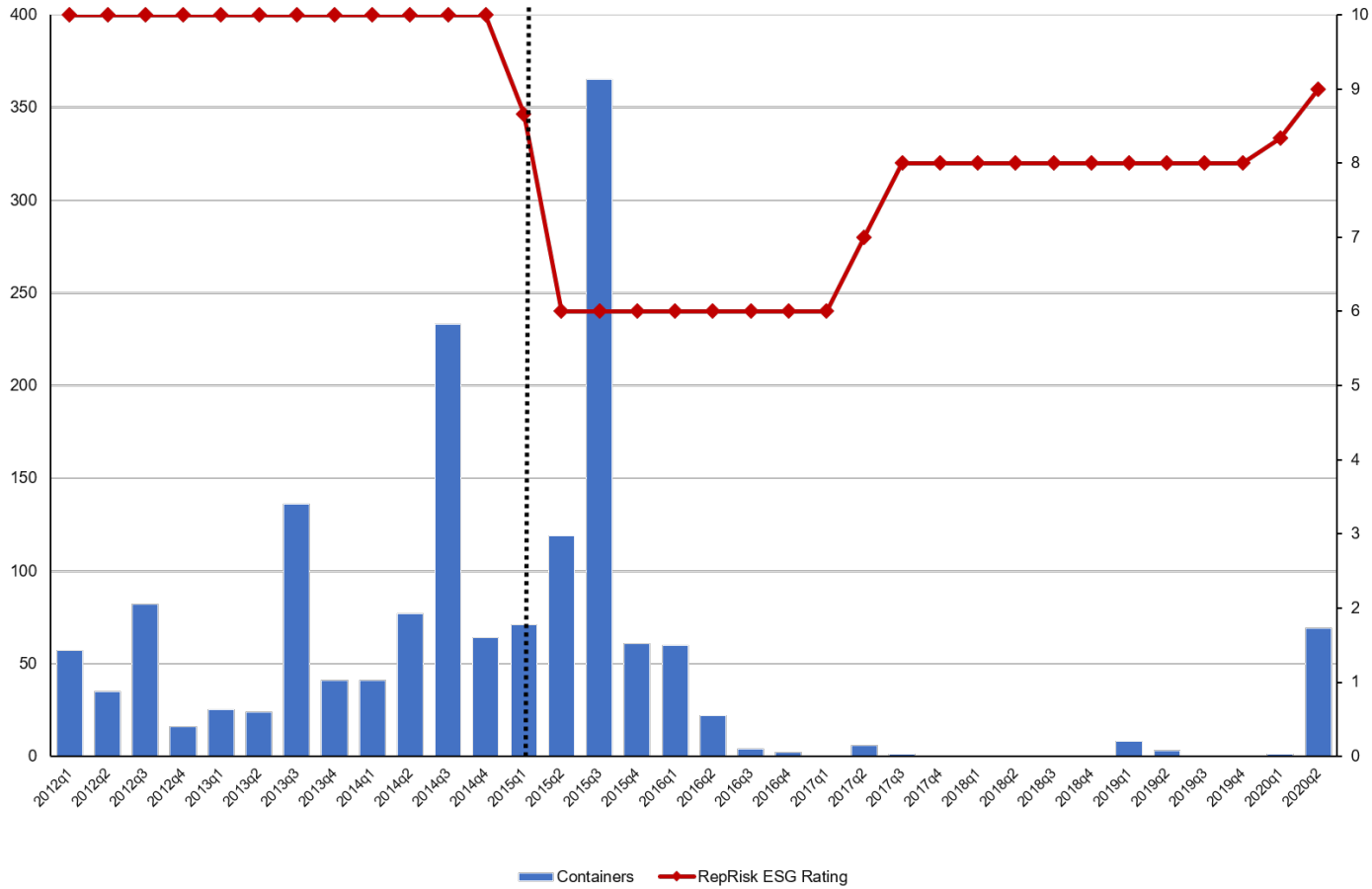
By Reuters Staff 3 MIN READ

SHANGHAI (Reuters) - About 5,000 workers have gone on strike at a shoe manufacturer in southern China over benefits, two activists and a worker said, marking one of the biggest work-stoppages in the country in months.

The company that owns the factory, Stella International Holdings Ltd, lists Guess? Inc, Michael Kors Holding Ltd, Prada SpA and Burberry Group PLC among its customers.

- Deckers Outdoor Corp. (Deckers) was a major U.S. customer of Chinese manufacturer Stella International Holdings (Stella)
- On March 11, 2015, 5,000 workers started protesting over wage benefits in one of Stella's factories

In-Sample Anecdotal Evidence: Deckers and Stella



- Trade is cut and Stella's ESG ratings drop around incident
- ESG scores increase and trade resumes in the long-run

"Stacked" Panel Structure

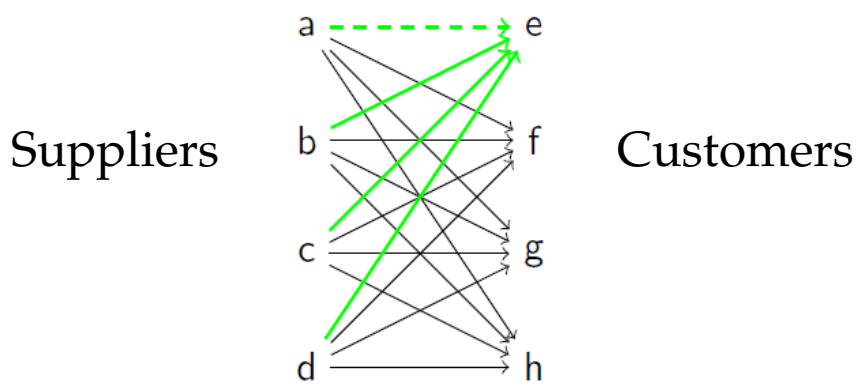
- Denote by t the supplier incident year
- We construct *cohorts* of treated and control trade relationships in a $[t-3, t+3]$ year window around the incident
  - Treated Relationships: Supplier-customer relationships in which suppliers experience E&S incidents at t
  - Control Relationships: Supplier-customer relationships in which suppliers do not experience any E&S incident in $[t-3, t+3]$
    - Includes *other suppliers of the same customer*
- We drop incidents that follow/are followed by other incidents in $[t-3, t+3]$
- Resulting panel contains 1,049 unique events, 1,010 unique suppliers, and 838 unique customers

Summary Statistics

"Stacked" Difference in Differences

$$Y_{i,j,c,t} = \beta_1 Treat\ Supp_{j,c} \times Post_{c,t} + \beta_2 X_{i,t-1} + \gamma_{i,j,c} + \tau_{i,c,t} + \epsilon_{i,j,c,t}$$

- i, j, and c index customers, suppliers, and cohorts, respectively
- $Treat\ Supp_{j,c}$ indicates the supplier hit by the E&S incident in cohort c
- $Post_{c,t}$ indicates years following the E&S incident
- $\tau_{i,c,t}$ is a customer firm-cohort-year fixed effect to capture time-varying customer characteristics (e.g., demand shocks)
- In our main specifications, we measure $Y_{i,j,c,t}$ with annual containers



Supplier E&S Incidents and Trade Relationships

Baseline Results

Dep. Var. =	Log(1+Containers)	1(Trade>0)	Log(1+Containers)
		Extensive Margin	Intensive Margin
	(1)	(2)	(3)
Treat Supp×Post	-0.111***	-0.042***	-0.095*
	(0.039)	(0.014)	(0.054)
Pair×Cohort FE	Yes	Yes	Yes
Firm×Year×Cohort FE	Yes	Yes	Yes
Obs.	990,439	990,439	410,322
Adj. R^2	0.392	0.160	0.640

After the supplier experiences an E&S incident:

- Container shipments to U.S. customers drop by 11.1%
- Relationships are 4.2% more likely to be terminated
  - Unconditional 9% annual termination rate
- For firms continuing to trade, shipments drop by 9.5%
  - Novel intensive margin effect

Incident Characteristics

Dep. Var. =	Log(1+Containers)			
	(1)	(2)	(3)	(4)
Treat Supp, E×Post	-0.111**			
	(0.049)			
Treat Supp, S×Post	-0.110*			
	(0.062)			
Treat Supp, High Severity×Post		-0.140**		
		(0.059)		
Treat Supp, Low Severity×Post		-0.086*		
		(0.051)		
Treat Supp, High Reaction×Post			-0.178***	
			(0.062)	
Treat Supp, Low Reaction×Post			-0.069	
			(0.058)	
Treat Supp, High Attention×Post				-0.137***
				(0.047)
Treat Supp, Low Attention×Post				-0.060
				(0.068)
Pair×Cohort FE	Yes	Yes	Yes	Yes
Firm×Year×Cohort FE	Yes	Yes	Yes	Yes
Obs.	990,439	990,439	990,439	990,439
Adj. R^2	0.392	0.392	0.392	0.392

- Stronger effects in the cross-section for incidents more likely to generate negative externalities, downstream effects
- Stronger effects in the time series in periods of high E&S awareness

Robustness

- Alternative trade measures — Trade
  - Number of shipments, weight, number of items
- Control relationships matched on — Matching
  - Customer industry and size
  - Supplier country
- Alternative restrictions on confounding events — Incidents
  - Exclude only confounding events in $[t-2, t+2]$ and $[t-1, t+1]$
- Less-stringent sets of fixed effects — Fixed Effects
- Alternative samples and specifications — Sample
  - Include G-related incidents with potential externalities
  - Use quarterly data frequency
  - Scale containers by size
  - Poisson regression specifications

Investor (or End-Consumer) Preferences?

Investor Preferences: Overview

- Cross-sectional tests based on *customers'* investor characteristics
  - U.S. customers' ESG scores
  - ESG-conscious investors of U.S. customers
  - E&S shareholder proposals
  - Public vs. private U.S. customers

- Within-supplier-incident methodology:
  - We estimate the reaction across different customer characteristics for the same supplier incident
  - Absorbs trade changes arising from general business risks, irrespective of E&S concerns
    - E.g., due to supplier default after the incident

U.S. Customer ESG Ratings

	Log(1+Containers)	Extensive Margin
	(1)	(2)
Treat Supp×Post	-0.054	-0.021
	(0.050)	(0.019)
Treat×Post×High CustESG	-0.138*	-0.047*
	(0.079)	(0.027)
Partition Var. × Year FE	Yes	Yes
Supplier×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	990,439	990,439
Adj. R^2	0.353	0.160

- We use Refinitiv data on customers' ESG ratings as first proxy for investor selection
- We find larger effects for customers with higher ESG scores
  - May also capture ability to manage financially-relevant ESG risks

E&S-Conscious Investors in U.S. Customers

	Log(1+Containers)	Extensive Margin
	(1)	(2)
Treat Supp×Post	-0.030	-0.011
	(0.055)	(0.021)
Treat×Post×High IO ESG	-0.151**	-0.056**
	(0.077)	(0.028)
Partition Var. × Year FE	Yes	Yes
Supplier×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	990,439	990,439
Adj. R^2	0.353	0.160

- We identify E&S-conscious institutional investors by large holdings in firms with high E&S ratings
  - As in Gantchev, Giannetti, and Li (2022)
- We find that trade cuts are concentrated in sub-sample of customers held by E&S-conscious funds

ESG Proposals in U.S. Customers

	Log(1+Containers)	Extensive Margin
	(1)	(2)
Treat Supp×Post	0.017	-0.002
	(0.067)	(0.026)
Treat×Post×ESG Proposal	-0.235**	-0.070**
	(0.100)	(0.035)
Partition Var. × Year FE	Yes	Yes
Supplier×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	559,468	559,468
Adj. R^2	0.364	0.173

- We use Institutional Investors Services data to identify Socially-Responsible Investing "ESG" proposals
  - Our most direct proxy of investor preferences
- We only find trade cuts when the customer received *at least one ESG proposal* in the pre-incident period

Public vs. Private U.S. Customers

	Log(1+Containers)	Extensive Margin
	(1)	(2)
Treat Supp×Post	-0.023*	-0.017***
	(0.013)	(0.005)
Treat×Post×Public Cust	-0.109***	-0.028*
	(0.041)	(0.015)
Partition Var. × Year FE	Yes	Yes
Supplier×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	28,005,984	28,005,984
Adj. R^2	0.279	0.105

- We expand the customer sample to private U.S. firms
- We find small baseline effects for private firms
  - Other stakeholders, business risk might drive some adjustments
- Much larger effects for publicly-listed firms
  - Difference unlikely driven by financial constraints
  - Highlight potential costs of being public

Constraints

U.S. End Consumers' Preferences

- Work in progress
  - We have results, need to wait for provider's approval to present them
- Main idea: Study how *end-customer* purchasing behavior changes around scandal
  - Use Nielsen scanner data on customer-level purchases
- Results:
  - Reduction in consumer-level purchases
  - Increase in point-of-sale prices
  - Suggests quantity drops due to lower supply
    - Liaukonyte et al. (2022) show limited effects of consumer boycotts

Switching Costs and Reallocation

Supplier Switching Costs

	Log(1+Containers)	
	(1)	(2)
Treat Supp, High HHI×Post	-0.036	
	(0.048)	
Treat Supp, Low HHI×Post	-0.217***	
	(0.064)	
Treat Supp, High Differentiation×Post		-0.086**
		(0.042)
Treat Supp, Low Differentiation×Post		-0.294***
		(0.103)
Pair×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	990,439	990,439
Adj. R^2	0.392	0.392

- We perform cross-sectional cuts based on supplier industry HHI and Rauch (1999) specificity index
- We document larger trade cuts when supplier industries are more competitive and differentiated
  - Higher availability of alternatives/lower switching costs

Supplier Switching Tests

Within each cohort, we estimate:

$$\begin{aligned} Y_{i,j,c,t} \quad = \quad & \beta_1 Treat\ Supp_{j,c} \times Post_{c,t} \\ & + \beta_2 \%Treat\ Supp_{i,c} \times TreatSupp_{j,c} \times Post_{c,t} \\ & + \beta_3 \%Treat\ Supp_{i,c} \times TreatCust,\ ControlSupp_{j,c} \times Post_{c,t} \\ & + \beta_4 X_{i,t-1} + \gamma_{i,j,c} + \tau_{c,t} + \epsilon_{i,j,c,t}, \end{aligned}$$

- Borrows from Giroud and Mueller (2019), Berg et al. (2021)
- Spillover coefficient of interest is β_3:
  - $\%Treat\ Supp_{i,c}$ measures the fraction of treated suppliers in a cohort
  - β_3 measures effect on imports by the same customer from *control suppliers* when the share of treated customers changes

Supplier Switching Tests: Results

Dep. Var. =	Log(1+Containers)		
	(1)	(2)	(3)
Treat Supp×Post	-0.119**	-0.119**	-0.086*
	(0.048)	(0.048)	(0.052)
%Treat×Treat Cust, Control Supp×Post	0.857***		
	(0.177)		
%Treat×Treat Cust, Control Supp, Same Country×Post		0.046	
		(0.336)	
%Treat×Treat Cust, Control Supp, Diff Country×Post		1.080***	
		(0.202)	
%Treat×Treat Cust, Control Supp, High SuppE&S×Post			10.345***
			(3.953)
%Treat×Treat Cust, Control Supp, Low SuppE&S×Post			-1.044
			(0.942)
Controls	Yes	Yes	Yes
Pair×Cohort FE	Yes	Yes	Yes
Year×Cohort FE	Yes	Yes	Yes
Obs.	990,439	990,439	39,182
Adj. R^2	0.266	0.266	0.239

- U.S. customers switch to other international suppliers:
  - In different countries
  - With high ESG ratings

New Suppliers Seem More Expensive

Dep. Var. =	Gross Margin t	Gross Margin $t+1$	Gross Margin $t+2$	Gross Margin $t+3$
	(1)	(2)	(3)	(4)
Treat Cust (CutTrade=1)×Post	-0.003	-0.006*	-0.010**	-0.010**
	(0.003)	(0.004)	(0.004)	(0.004)
Treat Cust (CutTrade=0)×Post	0.004	0.003	0.004	0.000
	(0.004)	(0.004)	(0.004)	(0.004)
Controls	Yes	Yes	Yes	Yes
Year×Cohort FE	Yes	Yes	Yes	Yes
Firm×Cohort FE	Yes	Yes	Yes	Yes
Obs.	24,434	22,996	21,147	19,105
Adj. R^2	0.928	0.934	0.930	0.930

- Collapse panel to the customer-cohort-year level to study effects on customers
- Gross profit margins drop for customers that cut trade
  - CoGS per dollar of revenue increases
  - Firms take costly actions to meet their investors' E&S preferences

Costco: Non-Monetary Benefits and Monetary Costs

Costco Shareholder Vote Signals Focus on Supply-Chain Emissions

Shareholders voted for a resolution calling for a tougher climate plan, against the wishes of the retailer's board

A Costco Wholesale store in Austin, Texas. The company said it takes climate change seriously and has a climate plan.

PHOTO: JOE RAEDLE/GETTY IMAGES

Governance by Exit

Governance by Exit

- So far, we have shown that firms take costly actions to meet the (non-monetary) E&S preferences of their investors
- If investors have E&S preferences, why exit and not engage?
  - Suppliers could keep misbehaving
- We argue that exit is used as a *governance tool*:
  - Trade cuts are stronger for small, private suppliers
    - Do not receive external governance from public markets
    - Engagement or monitoring can be expensive/ineffective
    - U.S. customers' exit may have large impact on their revenues
  - Customer exit leads to subsequent supplier ESG improvements
  - Customer exit and ESG improvements lead to trade reversals

Trade Cuts in the Cross-Section of Suppliers

	Log(1+Containers)	
	(1)	(2)
Treat Supp, Public×Post	-0.088	
	(0.059)	
Treat Supp, Private×Post	-0.124**	
	(0.050)	
Treat Supp, Large×Post		-0.088
		(0.057)
Treat Supp, Small×Post		-0.147***
		(0.041)
Pair×Cohort FE	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes
Obs.	990,439	990,439
Adj. R^2	0.392	0.392

- Trade cuts larger for
  - Private suppliers: lower governance from own capital markets
  - Small suppliers: U.S. customer exit constitutes bigger threat

Customer Exit and Supplier ESG Ratings

Dep. Var. =	Supplier RepRisk ESG Score		
	< P25	P25-P75	>P75
	(1)	(2)	(3)
Treat×Post(0)	-0.918***	-0.984***	-1.010***
	(0.060)	(0.045)	(0.066)
Treat×Post(+1)	-0.934***	-0.932***	-1.038***
	(0.069)	(0.053)	(0.072)
Treat×Post(+2)	-0.301***	-0.350***	-0.442***
	(0.095)	(0.054)	(0.082)
Treat×Post(+3)	-0.053	-0.265***	-0.430***
	(0.105)	(0.061)	(0.105)
Treat×Post(+4)	0.063	-0.125*	-0.337**
	(0.112)	(0.075)	(0.134)
Treat×Post(+5)	-0.053	-0.046	-0.252*
	(0.150)	(0.087)	(0.150)
Treat×Post(+6)	-0.160	0.050	-0.306*
	(0.182)	(0.105)	(0.177)
Supplier×Cohort FE	Yes	Yes	Yes
Year×Cohort FE	Yes	Yes	Yes
Obs.	17,871	37,634	15,936
Adj. R^2	0.866	0.860	0.857

- Columns sorted by trade change distribution percentiles
  - Large cuts (column 1) associated with fast ESG ratings reversals
  - Small cuts (column 3) associated with persistent ESG ratings drops

Trade Reversals

Dep. Var. =	Log(1+Containers)		
	where CutTrade=1 if		
	ΔTrade < 0	ΔTrade < -0.29	ΔTrade < -0.5
	(1)	(2)	(3)
Treat×Post4 (CutTrade=1, Inc_Rating=1)	0.377***	0.449***	0.549***
	(0.106)	(0.109)	(0.119)
Treat×Post4 (CutTrade=1, Inc_Rating=0)	0.219	0.296	0.477
	(0.241)	(0.252)	(0.319)
Treat×Post4 (CutTrade=0, Inc_Rating=1)	-0.126	-0.160	-0.142
	(0.156)	(0.146)	(0.127)
Treat×Post4 (CutTrade=0, Inc_Rating=0)	-0.298	-0.313	-0.303*
	(0.207)	(0.199)	(0.177)
Relationship×Cohort FE	Yes	Yes	Yes
Firm-year×Cohort FE	Yes	Yes	Yes
Obs.	233,442	233,442	233,442
Adj. R^2	0.566	0.566	0.566

- Double split the sample by:
  - Trade cuts between pre- and post-incident periods ($CutTrade = 1$)
  - Supplier ESG improvements in post-period ($IncRating = 1$)
- Joint trade cuts and ESG improvements lead to resumption of trade

Conclusions

- U.S. customers (partially) cut, reallocate trade after suppliers' E&S incidents
  - Imports drop by 11.1%, relationship 4.2% more likely to be terminated
  - Reallocation to other countries, better-ESG suppliers
- Firms take costly actions to meet E&S preferences of investors
  - Only customers with ESG-conscious investors cut trade more *after the same incident*
  - Privately-held customers cut trade by much less
  - Consistent with Costco anecdotal evidence
- Trade cuts are used as a governance tool
  - Stronger for small, private supplier
  - Lead to ESG improvements and subsequent trade reversals

Appendix

Summary Statistics

Variable	Obs.	Mean	Std. Dev.	P25	P50	P75
Treat Supp	1,000,950	0.007	0.084	0.000	0.000	0.000
Treat Cust, Control Supp	1,000,950	0.711	0.453	0.000	1.000	1.000
Post	1,000,950	0.559	0.496	0.000	1.000	1.000
Container	1,000,950	0.942	1.308	0.000	0.000	1.609
1 (Trade>0)	1,000,950	0.471	0.499	0.000	0.000	1.000
Size	1,000,950	8.418	2.251	6.846	8.272	9.813
MTB	1,000,950	1.350	1.147	0.515	1.075	1.741
Lev	1,000,950	0.221	0.166	0.088	0.225	0.308
R&D	1,000,950	0.020	0.040	0.000	0.000	0.026
Capx	1,000,950	0.045	0.031	0.020	0.038	0.063
Cash	1,000,950	0.128	0.113	0.041	0.095	0.182

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Robustness: Alternative Trade Measures

Dep. Var. =	#Shipments	Weight	Quantity
	(1)	(2)	(3)
Treat Supp×Post	-0.092***	-0.462***	-0.237**
	(0.036)	(0.151)	(0.099)
Pair×Cohort FE	Yes	Yes	Yes
Firm×Cohort×Year FE	Yes	Yes	Yes
Obs.	990,439	990,439	990,439
Adj. R^2	0.393	0.246	0.315

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Robustness: Control Sample Matching

	Log(1+Containers)			
	Industry	Industry, Size	Industry, Size, Supplier Country	Firm-countries with both treated and control suppliers
	(1)	(2)	(3)	(4)
Treat Supp×Post	-0.110***	-0.110***	-0.103**	-0.090*
	(0.039)	(0.038)	(0.044)	(0.047)
Controls	No	No	No	Yes
Pair×Cohort FE	Yes	Yes	Yes	Yes
Firm×Year×Cohort FE	Yes	Yes	Yes	No
Year×Cohort FE	No	No	No	Yes
Obs.	788,608	735,878	163,495	161,095
Adj. R^2	0.393	0.393	0.434	0.262

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Robustness: Confounding Incidents

Dep. Var. =	Log(1+Containers)	
	No confounding incidents two years before and after the event	No confounding incidents one year before and after the event
	(1)	(2)
Treat Supp×Post	-0.105***	-0.057**
	(0.034)	(0.027)
FirmÃCohort FE	Yes	Yes
FirmÃCohortÃYear FE	Yes	Yes
Obs.	811,101	1,093,221
Adj. R^2	0.394	0.393

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Robustness: Alternative Fixed Effects

Dep. Var. =	Log(1+Containers)			
	(1)	(2)	(3)	(4)
Treat Supp	0.137***	0.164***		
	(0.035)	(0.035)		
Treat Supp×Post	-0.091**	-0.101***	-0.098**	-0.091**
Controls	Yes	Yes	Yes	Yes
Year×Cohort FE	Yes	Yes	Yes	Yes
Firm×Cohort FE	No	Yes	Yes	No
Supplier×Cohort FE	No	No	Yes	No
Pair×Cohort FE	No	No	No	Yes
Obs.	990,439	990,439	990,439	990,439
Adj. R^2	0.016	0.057	0.230	0.266

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Robustness: Alternative Samples and Specifications

Dep. Var. =	Log(1+Containers)		Containers	Containers
	Including corruption, bribery, fraud	Quarterly data	Scaled by Size	Poisson Regression
	(1)	(2)	(3)	(4)
Treat Supp×Post	-0.095***	-0.063***	-0.007***	-0.264***
	(0.035)	(0.023)	(0.002)	(0.081)
Pair×Cohort FE	Yes	Yes	Yes	Yes
Firm×Year×Cohort FE	Yes	Yes	Yes	Yes
Obs.	1,027,861	4,080,488	990,439	936,179
Adj. R^2	0.392	0.398	0.481	
Pseudo R^2				0.721

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Financial Constraints

Dep. Var. =	Log(1+Containers)	
	(1)	(2)
Treat Supp × Post	-0.107**	-0.151***
	(0.053)	(0.052)
Treat × Post × High KZindex	-0.020	
	(0.082)	
Treat × Post × High WWindex		0.085
		(0.080)
Partition Var. × Treat	Yes	Yes
Supplier × Cohort FE	Yes	Yes
Firm × Year × Cohort FE	Yes	Yes
Obs.	940,259	942,722
Adj. R^2	0.352	0.352

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