

Responsible Sourcing? Theory and Evidence from Costa Rica

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The opinions are those of the authors, and not necessarily represent those of BCCR.

Responsible Sourcing (RS)

The adoption by MNEs of minimum standards on working conditions at their suppliers has become widespread

- ▶ Most commonly termed “supplier codes of conduct”
- ▶ Requirements on wage floors, benefits, safety standards, formality, unionization, etc.
- ▶ Stated objectives of RS: benefit workers in developing countries

What is the impact of RS policies on the ground?

- ▶ Are they only “hot air”? If not, what are their effects?
- ▶ Scarce theoretical work or evidence on the consequences of RS in host countries

This paper

1. Develop a quantitative GE theory to study the incidence of RS
 - ▶ Derive testable comparative statics to distinguish between hypotheses
 - ▶ Derive expressions of welfare effects (on average and by worker type)
2. Present evidence of the effects of RS policies on firms and workers
 - ▶ Build new database of RS rollouts of MNEs with subsidiaries in Costa Rica (CR)
 - ▶ 127 MNEs rolled out RS codes since 2009, affecting 45% of CR firms' output by 2017
 - ▶ Combine with firm-to-firm transactions and employer-employee data to trace RS exposure
 - ▶ Implement event-study design to provide new firm-, worker- and transaction-level evidence
3. Counterfactual analysis
 - ▶ Combine theory with evidence to study GE effects of RS in CR

Preview of findings

1. **Theory:** Welfare incidence in sourcing origin countries is ex-ante ambiguous
 - ▶ Depends on assumptions about market structure & MNE policy motivation
 - ▶ Welfare effect features interplay b/n “export tax” (+) and labor market distort. (-)
2. **Empirics:** RS not just “hot air”. Four years after RS rollout:
 - ▶ Significant reduction in supplier sales and employment (-8%)
 - ▶ Significant increase in wages, especially among low-wage workers (+6%)
3. **Quantification:** On net, positive effect of RS on economy as a whole (+0.3%)
 - ▶ Gains concentrated among initially low-wage workers (+1.3% nationwide)

Related literature

- ▶ Literature on the effects of FDI in developing countries
 - ▶ Javorcik (2004); Harrison & Rodriguez-Clare (2010); Alfaro-Ureña et al. (2020a and 2020b); Hjort et al. (2020)
- ▶ Literature on the economics and effects of RS programs
 - ▶ Macchiavello & Miquel-Florensa (2019); Harrison & Scorse (2010); Boudreau (2020); Bossavie et al. (2020); Amengual & Distelhorst (2020); Herkenhoff & Krautheim (2020)
- ▶ Literature on Fair Trade
 - ▶ De Janvry et al. (2015); Dragusanu & Nunn (2018), Podhorsky (2013, 2015)
- ▶ Literature on Corporate Social Responsibility
 - ▶ Kotchen (2006), Campbell (2007), Bénabou & Tirole (2010), Besley & Ghatak (2007), Hart & Zingales (2017)

Outline

Model and comparative statics

Data and context

Empirical strategy and results

Model selection and estimation

Welfare implications

Baseline environment: Workers

- ▶ 2 countries $k \in \{H, F\}$: Home=Costa-Rica; Foreign=Rest of the World

- ▶ Preferences:

$$U^k = \left(\int_{\Omega^k} d_\omega q_\omega^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}}$$

- ▶ d_ω demand shifter for variety ω

- ▶ Two types of workers $t = l, h$ (low-wage and high-wage)

- ▶ Imperfect substitutes in production

$$\ell = \left[\alpha^l \ell^l \frac{\rho-1}{\rho} + \alpha^h \ell^h \frac{\rho-1}{\rho} \right]^{\frac{\rho}{\rho-1}}$$

- ▶ Inelastic labor supply of each type L_k^t
- ▶ Income = labor income w_k^t + transfer of domestic firm profits, prop. to wage

Baseline environment: Production

- ▶ Final good produced by:
 - ▶ Non-MNE firms. Heterogeneous in productivity (Pareto θ). Use labor
 - ▶ Foreign MNE x with Home subsidiary. Homogeneous. Combine intermediate inputs produced by Home firms:

$$M_x = \left(\int_{\Omega_x} m_{\omega(x)}^{\frac{\sigma-1}{\sigma}} d\omega(x) \right)^{\frac{\sigma}{\sigma-1}}$$

- ▶ Heterogeneous Home firms produce both final good and MNE inputs
 - ▶ Constant marginal cost (labor), fixed cost on each production line (\Rightarrow selection)
 - ▶ Assume tougher selection on MNE input market
- ▶ For simplicity:
 - ▶ Exports from Home to Foreign: done by MNE subsidiaries only
 - ▶ Exports from Foreign to Home: done by Foreign non-MNE firms only
- ▶ Monopolistic competition in each market

RS policies

- ▶ MNEs impose minimum standards on their suppliers = higher labor costs:
 - ▶ Binding for low-wage workers, not binding for high-wage workers
 - ▶ Must apply to all production, including domestic sales

- ▶ Wage for worker type l higher in RS supply chains than at other firms (by $\tau \geq 1$):

$$w_H^{l,RS} = \tau w_H^l,$$
$$w_H^{h,RS} = w_H^h.$$

Drivers of the impact of RS policies

Hyp. A vs. A': What is the motivation of the MNE for RS policy?

Hyp. B vs. B': What is the market structure on the Home labor market?

Hyp. C vs. C': Is RS accompanied by productivity gains among suppliers?

Hyp. D vs. D': How much of the cost of RS is passed through to the MNE?

Hypothesis A vs. A'. Motivation for RS

Why do MNEs implement RS policies?

Hypothesis A: RS policy is chosen outside of the firm profit maximization program

- ▶ E.g., choice of the MNE management pursuing other motives: $U^{manager} = U(\Pi, \tau)$
- ▶ Take τ as a parameter, chosen outside of $\max \Pi$ problem

Hypothesis A': RS policy is chosen to maximize profits

- ▶ Response of foreign consumers' demand (demand shifter d_x):

$$\frac{\partial d_x}{\partial \tau} \geq 0.$$

- ▶ Choice of RS τ :

$$\underbrace{\frac{\partial \Pi}{\partial d} \frac{\partial d}{\partial \tau}}_{>0} + \underbrace{\frac{\partial \Pi}{\partial \tau}}_{<0} = 0$$

Hypothesis B vs. B'. Labor market structure

Are RS policies put in place in a context where wages were too low to begin with?

Hypothesis B: The Home labor market is competitive

- ▶ Firms face perfectly elastic labor supply and are wage-takers. Baseline model.

Hypothesis B': The Home labor market is monopsonistic

- ▶ Firms are wage-setters, through monopsonistic competition
- ▶ Extend the model to feature upward-sloping labor supply and monopsonistic firms
 - ▶ Workers have idiosyncratic valuations of jobs at different firms + wage-setting firms
 - ▶ Rest is unchanged

Details

Hypothesis C vs. C'. Productivity gains from RS

Are RS policies accompanied by labor productivity gains among suppliers?

Hypothesis C: RS policies are not accompanied by labor productivity gains

- ▶ Pure cost increase τ . Baseline model.

Hypothesis C': RS policies are accompanied by labor productivity gains

- ▶ Training, technology transfers, higher incentives, etc
- ▶ Potential labor productivity gains $T \geq 1$ for all workers at RS firms. Labor compensation:

$$\begin{aligned}\tilde{w}_H^{l,RS} &= T\tau w_H^l, \\ \text{and } \tilde{w}_H^{h,RS} &= T w_H^h.\end{aligned}$$

Hypothesis D vs. D'. Pass-through of cost increase

How much of the cost of RS is borne by the intermediate supplier vs. the MNE?

Hypothesis D: The increased cost of RS policies is fully passed through to the MNE

- ▶ Pass-through $\beta = 1$. Baseline model.

Hypothesis D' The increased cost of RS is imperfectly passed-through to the MNE

- ▶ Capture potential buyer market power of MNE in a reduced-form way: $0 \leq \beta < 1$

Comparative statics across model variants and model selection

Hypotheses:	Baseline	A'	B'	C'	D'
	ABCD	Demand Shock	Labor Monopsony	Prod. Gains	Imp. Passthru
Outcomes					
<i>Compliers</i> <i>(intensive margin)</i>					
Sales to MNE	-	+	+	-	-
<i>Exposed firms</i> <i>(ext. + int. margin)</i>					
Sales to MNE	-	+	ambiguous	-	-
Domestic Sales	-	-	+	-	-
Total Sales (MNE + Home)	-	ambiguous	ambiguous	-	-

A: RS policies are chosen outside of the firm profit maximization program

B: Home labor market is competitive

C: RS policies are not accompanied by labor productivity gains

D: The increased cost of RS policies is fully passed through to the MNE

Model and comparative statics

Data and context

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Five administrative datasets from Costa Rica. 2008-2017

1. Firm-to-firm transactions: all formal supplying relationships $>$ \$4.2K per year
2. Matched employer-employee administrative data: e.g., labor earnings
3. Corporate income tax returns: e.g, total sales, employment
4. Customs records: e.g., value of goods exported
5. Foreign ownership records

New database on RS rollouts

- ▶ Start w/ 484 MNE subsidiaries in CR whose av. yearly local purchases $>$ \$1M
 - ▶ Account for 77% of local input purchases, 83% of employment and 95% of exports of all foreign-owned firms in CR

- ▶ Implement comprehensive search of RS reforms
 - ▶ Double-blind search process: all subsidiaries' and parent company webpages, corporate filings, reports, news releases, local and international media outlets
 - ▶ 152 RS-policy rollouts by 127 MNEs in CR between 2009-2017

Some descriptive statistics

MNEs with RS rollouts between 2009-2017

- ▶ Average employment: 685 workers. Average yearly sales: 97 million dollars
- ▶ 38% US-owned, 27% European-owned
- ▶ 40% manufacturing, 44% services, 14% retail (incl. repair & maint.), 2% agriculture
- ▶ Examples: Boston Scientific, Cisco Systems, Walmart, Standard Fruit Company

CR firms exposed to RS rollouts:

- ▶ Average number of workers: 16. Average yearly sales: 1.2 million dollars sales
- ▶ 11% manufacturing, 54% services, 26% retail (incl. repair & maint.), 9% agriculture
- ▶ Share of output from CR firms that are subject to active RS codes grew from 30% to 45% between 2009 and 2017

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Event-study designs

Supplier-level specification

$$y_{ist} = \alpha_i + \gamma_{st} + \sum_{\eta=k_l}^{\eta=k_u} \beta_{\eta} I(\text{Years since } RS_{it} = \eta) + \epsilon_{ist}$$

i = firm, s = 4-digit sector, t = year. Firm exposure to RS (RS_{it}) defined based on positive sales to RS-MNE one year before rollout (at period $\eta = -1$)

Worker-level and transactions-level specifications

$$y_{ijst} = \alpha_{ij} + \gamma_{st} + \sum_{\eta=k_l}^{\eta=k_u} \beta_{\eta} I(\text{Years since } RS_{jt} = \eta) + \epsilon_{ist}$$

Worker-level: j = employer (supplier), i = employee. Supplier exposure RS_{jt}

Transactions-level: j = MNE, i = supplier. RS_{jt} at the MNE level (rollouts)

Identification

Three main concerns:

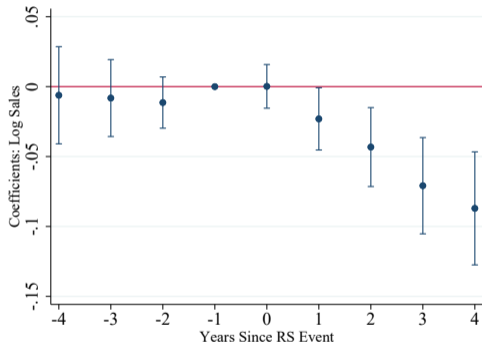
1. Non-random treatment assignments
2. Even if random, several concerns about “staggered D-i-D” setting
 - ▶ When i) treatments occur at different times, ii) effects evolve over time, and iii) shape of dynamic effects differs across cohorts (e.g. Goodman-Bacon, 2019; Abraham & Sun, 2020; Borusyak et al. 2021)
3. “Exposure” selected on positive sales event to an MNE at period $\eta = -1$

What we do:

1. Limit sample to CR firms supplying to an MNE at some point during 2008-2017 + Instrument for RS events using global roll-outs by the MNE
2. Estimate event study “cohort-by-cohort” using Abraham and Sun (2020)
3. Include parallel treatment timeline of having sold to any MNE at period $\eta = -1$

Supplier level: Effect on log total sales and log employment

(a) Log total sales



(b) Log employment

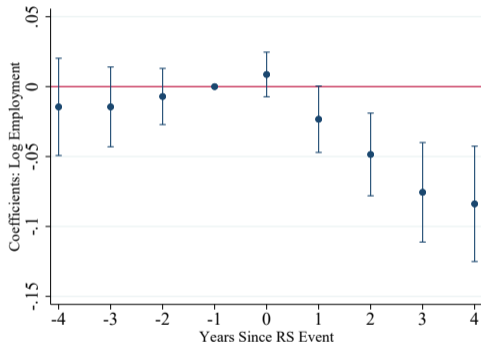
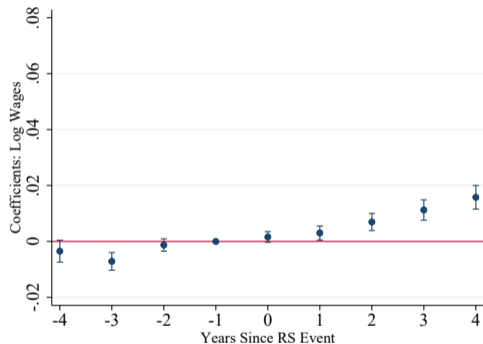


Table sales

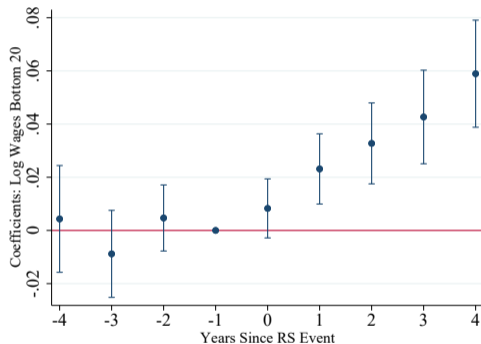
Table employment

Worker level: Effect on log monthly earnings

(a) All workers

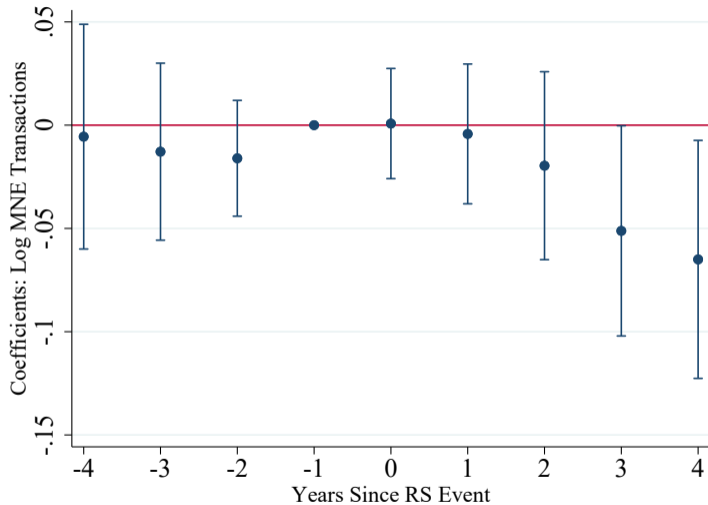


(b) Bottom 20%



Table

Transaction level: Effect on intensive-margin sales to MNE



Table

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Domestic Sales	-	-	+	-	-
Total Sales (MNE + Home)	-	ambiguous	ambiguous	-	-

Hence, derive equations for parameter estimation under the most general variant of the theory supported by the evidence (i.e., A, B, either C or C', either D or D')

Parameter estimation

- ▶ Estimate $\hat{\tau}$ using the effect on the wages of high-wage workers at RS-exposed firms: $\hat{w}^{h,RS} - \hat{w}^{h,N} = \hat{\tau}$
- ▶ Three moments to pin down $\hat{\tau}$, θ and β :
 - ▶ Compliers' sales to the RS-MNE: $\hat{y}_{x^{RS}} - \hat{y}_{x^N} = \beta (1 - \sigma) \chi^l \hat{\tau}$
 - ▶ Domestic sales of RS-exposed suppliers: $\hat{Y}_{HRS} - \hat{Y}_{HN} = (1 - \sigma) \chi^l \hat{\tau}$
 - ▶ Total sales of RS-exposed suppliers:
$$\hat{Y}_{tot^{RS}} - \hat{Y}_{tot^N} = \left[1 - \sigma - \xi \sigma \frac{\theta - \sigma + 1}{\sigma - 1} + (1 - \beta) \xi \left(\sigma - \frac{\theta}{\sigma - 1} \right) \right] \chi^l \hat{\tau}$$
- ▶ Estimate ρ using effect on relative employment of low- vs high-wage workers: $\ell^{l,RS} - \ell^{l,N} - [\ell^{h,RS} - \ell^{h,N}] = -\rho \hat{\tau}$
- ▶ Take $\sigma = 5.03$ from Alfaro-Ureña et al. (2020). Compute cost-share of low-wage workers ($\chi^l = 0.15$) and av. sales share to RS-MNEs by exposed firms ($\xi = 0.25$)
- ▶ Then, $\hat{\tau} = 0.014$, $\hat{\tau} = 0.149$, $\theta = 7.47$, $\beta = 0.96$, $\rho = 0.71$

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Welfare impact of RS policies

- ▶ Compute first-order effect of RS policy on Home welfare. Write $\hat{x} = d \log x$
 - ▶ Start at $\tau = 1, T = 1$ (no policy)
 - ▶ Assume a set of MNEs impose an RS policy $(\hat{\tau}, \hat{T})$, small shocks
 - ▶ In presentation: case with heterogeneous firms but w/o selection ($\theta \rightarrow \sigma - 1$)

Welfare and distributional effects of RS

$$\hat{U}_H = (\beta - \Lambda) W^{\text{tax}} \chi^l \hat{\tau} + (\lambda_{FH} + \Lambda \lambda_{HH}) W^{\text{prod}} \hat{\tau}$$

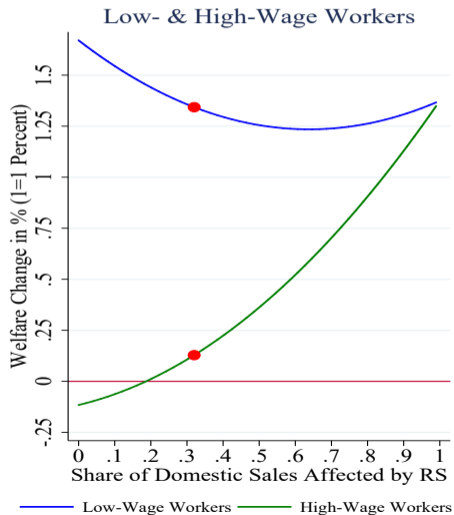
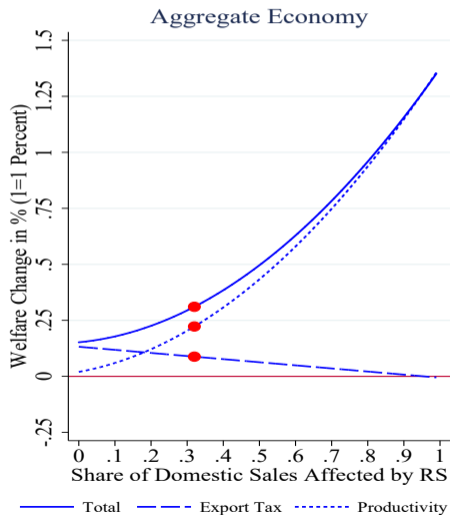
- ▶ W^{tax} : welfare gain from an **export tax** on all Home exports sufficient stats
 - ▶ Effective tax: $\chi^l \hat{\tau}$, χ^l = share of low-wage empl. in labor costs
 - ▶ Lower pass-through β to Foreign prices: less ToT effects, lower welfare gains
 - ▶ Larger leakage of RS-policy to domestic production Λ : higher distortion
 - ▶ Ambiguous sign of welfare effect from τ
- ▶ $W^{\text{prod}} \hat{\tau}$: welfare gain from a **productivity increase** for all workers in Home
 - ▶ Positive, scaled down by fraction of workers at RS-compliant producers
- ▶ The policy is **unambiguously progressive**: $\hat{U}_H^l - \hat{U}_H^h = (1 - \Lambda) \lambda_{FH} \hat{\tau} > 0$

distributional effects

Welfare effects in the aggregate and by worker type

Sensitivity to Λ (the leakage of RS into domestic production)

Sensitivity to other parameters



Conclusion

- ▶ Increasingly widespread adoption of Responsible Sourcing policies by MNEs
 - ▶ Imposed on their suppliers in sourcing countries
- ▶ We combine a unique database with a quantitative GE model to study the effects of RS policies in the context of Costa Rica
 - ▶ In the data, we find that RS is not just "hot air"
 - ▶ In the theory, the welfare effect of RS is a priori ambiguous...
 - ▶ ... but beneficial in our empirical context, especially for low-wage workers
- ▶ **Thank you for your comments!**