Responsible Sourcing?
Theory and Evidence from Costa Rica*

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Abstract

Multinational enterprises (MNEs) increasingly impose "Responsible Sourcing" (RS) standards on their suppliers worldwide, including requirements on worker compensation, benefits and working conditions. Are these policies just "hot air" or do they impact exposed suppliers and their workers? What is the welfare incidence of RS in sourcing countries? To answer these questions, we develop a quantitative general equilibrium (GE) model of RS and combine it with a unique new database. In the theory, we show that the welfare implications of RS are ambiguous, depending on an interplay between what is akin to an export tax (+) and a labor market distortion (−). Empirically, we combine the near-universe of RS rollouts by MNE subsidiaries in Costa Rica since 2009 with firm-to-firm transactions and matched employer-employee microdata. We find that RS rollouts lead to significant reductions in firm sales and employment at exposed suppliers, an increase in their salaries to initially low-wage workers and a reduction in their low-wage employment share. We then use the estimated effects and the microdata to calibrate the model and quantify GE counterfactuals. We find that while MNE RS policies have led to significant gains among the roughly one third of low-wage workers employed at exposed suppliers *ex ante*, the majority of low-wage workers lose due to adverse indirect effects on their wages and the domestic price index.

1   Introduction

Demands by policy-makers and the general public for multinational enterprises (MNEs) to "clean up their supply chains" and implement more equitable production practices in low- and middle-income countries have become widespread over recent years. In response, it has become common practice for MNEs to impose *Responsible Sourcing* (RS) requirements on their suppliers in sourcing countries (e.g., ILO, 2016). RS requirements mainly take the form of "supplier codes of conduct" and include compulsory standards on working conditions (such as wage floors, guaranteed benefits, maximum working hours, paid leave and safety standards), other production practices (such as worker representation and environmental standards) and enforcement provisions (such as third-party auditing). Despite the growing adoption of RS by MNEs, there is relatively limited theoretical work or empirical evidence on the economic incidence of these policies and their effectiveness at raising the welfare of workers in sourcing countries. In this paper, we combine theory and data to shed light on these questions. Our analysis focuses on RS practices that concern working conditions, leaving other potential impacts of RS—such as their environmental implications—to future research.

Our paper makes several contributions. First, we develop a quantitative general equilibrium (GE) model to study the incidence of RS in theory and guide the analysis. Second, we build a unique database that allows us to track the rollout of RS requirements by MNEs and trace their effect on suppliers and workers in the sourcing country. Our empirical context is Costa Rica, a middle-income country with hundreds of foreign MNE subsidiaries that source inputs locally across a wide range of economic activities. The data confirm the growing reach of RS: by the end of our sample in 2019, 38% of all output by domestic firms was produced by suppliers to MNE subsidiaries in Costa Rica subject to active RS codes. We use this database to provide new evidence on the effect of RS rollouts on MNE suppliers and their workers. Third, we combine the estimated effects with the model's comparative statics to calibrate the model and conduct counterfactual analyses of the welfare implications of RS on average and across worker types.

We begin by laying out the model. Heterogeneous firms in the sourcing country produce final goods for their domestic market and may also produce intermediate inputs demanded by foreign-owned MNE subsidiaries. We model the core of RS policies as an increase in the labor costs of suppliers who sell to an RS-active MNE. We assume that they are binding for initially low-wage workers, but not for high-wage workers whose working conditions are unlikely changed by RS standards. In line with the RS codes in our data, these new standards affect all of the suppliers' production, including their sales to non-RS buyers. We allow for these labor cost increases to be only partially passed-through to the MNE. The lower the pass-through, the higher the buyer

market power of the MNE. In addition, RS cost increases may be accompanied by other facets of RS policies. MNEs may roll out RS policies in reaction to pressure from their consumers to implement more equitable practices. In the model, we thus allow MNEs to experience a demand increase as a result of adopting RS practices. Furthermore, we allow for RS rollouts to have labor productivity effects due to, e.g., contemporaneous transfers of technology or expertise by the MNE that may accompany RS policies. Finally, the impact of RS depends on the labor market structure in the sourcing country. In our baseline, labor markets are competitive. Alternatively, we also consider a model where local firms exert monopsony power so that wages are marked down and inefficiently low, providing a potential policy rationale for MNE-imposed wage increases.[1]

Armed with this framework, we dissect the welfare impact of RS policies in the sourcing country. We show that the labor cost increase imposed by RS has an *a priori* ambiguous impact on workers' welfare. On the one hand, if all the output produced by RS-affected suppliers is destined for exports, RS requirements can be isomorphic to an export tax. This makes RS welfare-improving for the sourcing country through a classic terms-of-trade effect. On the other hand, MNE buyer-market power vis-à-vis its suppliers attenuates these terms-of-trade gains as it limits the cost pass-through to the MNE and its foreign buyers. Furthermore, as suppliers produce not just for exports but also for domestic consumption, RS policies "leak" into the domestic price index. This force decreases welfare by introducing a labor market distortion where RS leads to misallocation between RS-compliant firms and others. If, in addition, RS is accompanied by a positive demand shock for the MNE's output or direct labor productivity gains for suppliers, the welfare effect will be more positive. Last, the welfare results derived in the baseline model also hold in a model with unemployment, albeit subject to an attenuating factor that we formalize. In terms of distributional implications, RS leads to symmetric aggregate welfare effects in GE for low- and high-wage workers. However, there are meaningful distributional effects within worker groups. Low-wage workers employed at exposed suppliers experience the direct improvement in their working conditions due to RS, while non-exposed low-wage workers only experience indirect GE adjustments on wages and their price index—that we show to be negative.

We then take the analysis to the data. We make use of several administrative datasets covering the 2008-2019 period, including firm-to-firm transactions, matched employer-employee data, customs microdata, corporate tax returns, foreign ownership data and linked information from the ORBIS database on the global outcomes of MNEs with subsidiaries in Costa Rica. We combine these data with a novel dataset identifying new rollouts of RS supplier codes of conduct among 481 MNEs with subsidiaries sourcing in Costa Rica over this period. Using a comprehensive double-blind search and data entry, we identify 165 RS rollouts by 135 of the MNE subsidiaries

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[1]We do not find empirical support for the comparative statics of this case in our setting.

targeted at improving working conditions at their suppliers over this period. This database allows us to trace the evolution of firm and worker outcomes among suppliers before and after the rollout of new supplier codes of conduct over this period. In the empirical analysis (as in the model's comparative statics below), we estimate the effects of "exposure" to a new RS rollout by comparing changes in outcomes of suppliers that were selling to the MNE in the year before the announcement of the new RS code vs. those of suppliers to other MNEs over the same period. To do so convincingly, we implement an event-study design and build on recent contributions on identification and inference using difference-in-differences (DiD) with staggered treatments.[2] We also address concerns that MNEs may target RS rollouts at time periods in which their Costa Rican suppliers are experiencing other shocks (that also may not be apparent in pre-trends) by instrumenting for local policies with rollouts that are decided at the global headquarters of the MNE and affect suppliers worldwide.

We find that RS policies significantly reduce total sales and employment at exposed suppliers. Sales decline by about 7% 4 years after the RS rollout and employment by 6%. These effects are concentrated among smaller suppliers in less regulated service sectors and are most pronounced when implemented by MNEs headquartered in countries with stricter labor regulations and higher management scores. Moving from supplier- to worker-by-firm-level event studies, we find a 1.5% average increase in monthly earnings that is driven by a 4.5% increase for workers in the bottom quarter of initial earnings. In line with this, the relative employment of low vs. high-wage workers (bottom vs. top quartiles) decreases by 14%. Using the firm-to-firm transaction data, we find that exposed suppliers experience sales declines both to non-RS buyers and to the RS-MNE (on both the intensive and extensive margins).

These findings suggest that RS requirements are on average not just "hot air", with effects on exposed suppliers and workers that are consistent with increases in labor-related costs concentrated among initially low-wage workers. But this reduced-form evidence, by design, would be insufficient to investigate the aggregate implications of RS, as it only measures relative effects on exposed vs. non-exposed suppliers in the wake of single MNE-specific RS rollout events—and is therefore partial equilibrium in nature. In the final part, we combine the evidence with the model to evaluate the overall welfare implications of RS policies in Costa Rica as of 2019. We derive comparative statics in the model that correspond to the ones in the event study—comparing changes in outcomes due to an RS rollout between suppliers to the RS-MNE and suppliers to other MNEs. We then confront these comparative statics with the event-study point estimates to rationalize the observed effects and estimate the key parameters of the model, including the size

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[2]See recent contributions by e.g., Callaway and Sant'Anna (2020), Sun and Abraham (2020), De Chaisemartin and d'Haultfoeuille (2020), Borusyak et al. (2021), Goodman-Bacon (2021), Roth and Sant'Anna (2021).

of the RS policies itself. We find that on average RS rollouts correspond to a labor cost increase of roughly 12% among low-wage workers that is only partially passed-through to the MNE (with a 0.8 pass-through), and that these RS cost increases are not accompanied by discernible positive productivity or demand effects.

Using the calibrated model, we quantify counterfactuals that compare an equilibrium without RS to one corresponding to the extent of RS policies that we observe to be in place at the end of our sample in 2019. We find that RS policies have had positive but minor aggregate implications on aggregate welfare (+0.2%) in our empirical context and decompose the opposing forces underlying this. These aggregate effects, however, mask significant heterogeneity within worker types: the roughly 30% of low-wage workers employed at exposed MNE suppliers *ex ante* experience significant welfare gains (+8.1%), while the remaining majority of low-wage workers at non-exposed firms experience real income losses (-3.1%) due to adverse equilibrium effects on their wages and leakage to the domestic price index. We also report a number of additional results obtained under alternative model assumptions and parameter values. They are informative to assess the sensitivity of our findings for Costa Rica, and to illustrate how the impact of RS may differ in other empirical contexts.

It is also important to highlight some limitations of our study. Costa Rica is a middle-income country, more developed than many low-income countries where RS has also been implemented. The RS requirements that we study both theoretically and empirically—i.e., improved compensation, benefits, safety standards—likely differ from other dimensions of RS that may bind in low-income contexts, such as child labor bans. In theory, it would be a different counterfactual exercise to instead ban a type of employment (e.g., Faber et al., 2017). This and other differences in the institutional and labor market environments naturally demand some caution, and additional work in this area, when extrapolating findings from one study to other contexts. In addition, while our database is arguably unique, there are still limitations to what we can observe. In particular, informal work arrangements are not captured in the employer-employee database. Since RS consists in part of enforcing domestic labor laws and requiring formality, the administrative data on earnings and employment may not capture part of the effective increase in labor costs due to RS (e.g., missing wage increases or firing among initially informal workers). We address this concern by estimating the implied increase in supplier costs due to RS from the observed sales effects, instead of solely relying on the earnings effects in the employer-employee data.[3]

Our paper contributes to a small but growing empirical literature on the effects of MNE sourcing policies on supplier outcomes. Harrison and Scorse (2010) study the effect of anti-

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[3]We then also assess the sensitivity of the welfare results to different assumptions of how much of that estimated cost increase is captured by workers.

sweatshop campaigns targeting contractors for MNEs in the textile, footwear, and apparel sector in Indonesia. Using a DiD design across sectors and regions, they find that campaigns led to wage increases, falling profits and firm exit. More recently, Boudreau (2021) uses a randomized control trial to study the introduction of safety committees at apparel producers in Bangladesh, and Amengual and Distelhorst (2020) study compliance with Gap Inc's code of conduct for labor standards. Both studies find that RS requirements increase compliance with the law and safety measures.[4] Relative to this literature, our paper develops an open-economy model to study the welfare implications of RS in GE, and combines the theory with a unique new database.

The paper also relates to an existing literature on the implications of "fair trade" certification (e.g., Dragusanu et al., 2022, De Janvry et al., 2015, Podhorsky, 2013, 2015). This literature has emphasized the role of fair trade in redistributing agricultural profits from imperfectly competitive intermediary wholesalers to farmers in developing countries (e.g., Dragusanu et al., 2022, Podhorsky, 2015). In contrast, in our setting RS requirements are chosen and implemented by the MNEs on their own supply chain. More recently, Macchiavello and Miquel-Florensa (2019) study a "buyer-driven" quality and sustainability upgrading program among coffee farmers in Colombia. Using a spatial regression discontinuity design, they find that eligible farmers increased the quality of their coffee and the program led to significant income gains.

The paper also contributes to a larger literature on the direct effects of MNE production on worker and firm outcomes in developing countries—including through the MNEs' in-house policies on working conditions in their plants (see e.g., Harrison and Rodríguez-Clare (2010) for a review, earlier work by Javorcik (2004), and Alfaro-Ureña et al. (2021) and Alfaro-Ureña et al. (2022) for two recent studies in Costa Rica). Regarding in-house MNE labor policies, Hjort et al. (2020) find that MNEs anchor wages at their subsidiaries abroad to the level at headquarters.[5] In contrast, this paper evaluates the implications of the relatively more recent introduction of RS policies by MNEs for their suppliers in global value chains. As these policies have the stated objective to benefit worker welfare in sourcing markets, our analysis sets out to investigate this question theoretically and empirically.

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[4]Bossavie et al. (2020) study the effects of improvements in Bangladeshi labor regulations after the factory collapse of Rana Plaza in 2013. Using a synthetic control approach, they find that working conditions improved whereas female wages decreased. Herkenhoff and Krautheim (2022) introduce cost savings from unethical practices in a model of global sourcing decisions with incomplete contracts. Koenig et al. (2021) study the geography of international NGO campaigns against unethical practices in a model of international trade.

[5]Méndez-Chacón and Van Patten (2021) propose a historical case study of MNE investments by the United Fruit Company in non-wage amenities for its workers, also in the context of Costa Rica. They find that these investments can have positive long-run effects both locally and in the aggregate. McLaren and Im (2021) propose a model of the optimal labor bargaining chosen by origin countries who face a trade-off between attracting investment on one side and sharing of MNE rents on the other. They find that lowering cross-border transaction costs does not imply a race to the bottom in this setting.

2 Theory

To set the stage for our analysis of RS, we consider a model with two countries, Home (Costa Rica in our analysis) and Foreign (the rest of the world).[6] Foreign MNEs have subsidiaries in Home sourcing inputs from Home firms. Perhaps motivated by the demand of Foreign consumers, MNEs may engage in RS policies that impose a labor cost increase on their suppliers in Home. We now study the impact of such MNE policies on production and on the welfare of Home workers.

In what follows, we first lay out the model and derive comparative statics with respect to RS policies. These comparative statics will be useful to interpret the empirical results of Section 4 and to estimate the model's key parameters in Section 5.1. We then analyze the welfare implications of RS for Home workers in GE. Appendix A provides derivations and additional details.

2.1 Baseline setup

Workers The economy features two types of workers, low- and high-wage, indexed by $t = l, h$. They are endowed with one unit of labor that they supply inelastically.[7] The aggregate supply of type t in country $i = H, F$ (for *H*ome and *F*oreign) is $\bar{L}_i^t$. The two worker types are imperfect substitutes in production with constant elasticity of substitution ρ. It will be convenient to denote ℓ the labor composite used by a producer that hires ℓ^t type-t workers:

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

where the parameters $\left\{ \alpha^t \right\}_{t=l,h}$ shift demand for type-t workers. Workers derive utility from the consumption of local and imported goods ω, with CES utility:

$$U_i = \left(\int_{\Omega_i} d_\omega^{\frac{1}{\sigma}} q_\omega^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}}, \tag{2}$$

where Ω_i is the set of varieties available for final consumption in country i, q_ω denotes consumption of variety ω, d_ω is a demand shifter for ω and σ is the elasticity of substitution between varieties. The corresponding CES price index is $P_i = \left(\int_{\Omega_i} d_\omega p_\omega^{1-\sigma} d\omega \right)^{\frac{1}{1-\sigma}}$, where p_ω is the price of variety ω. Workers derive income from their labor as well as from their collective ownership of Home firms, whose profits are distributed proportionally to labor income.

Producers The model features two types of producers: "MNEs" and "firms". There is a fixed mass N_M of homogeneous MNEs that are headquartered in Foreign and have a subsidiary in Home. MNE subsidiaries produce in Home and export their production to their headquarters, while headquarters in Foreign sell products to final consumers. In addition, a fixed mass N_i of

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[6]In Appendix A.6.4, we lay out a multi-country version of the model, where MNE firms source from a range of countries. We show that in our context the results obtained in the simpler setup extend to the more general case.

[7]We also consider an extension with unemployment that we lay out in Appendix A.6.1 and quantify in Section 5.2.

non-MNE firms (hereafter simply referred to as "firms") operate in country i. They produce final varieties and Home firms may also produce distinct intermediate inputs for MNE subsidiaries.

Firms Firms are heterogeneous in productivity z and use labor as the sole factor of production. In each country, firm productivities z are distributed Pareto with parameter $\theta \geq \sigma - 1$ and with minimum $\underline{z}_i$ (i.e., $G_i(z) = 1 - (z/\underline{z}_i)^{-\theta}$). To sell in each market (the final good market or the intermediate input market for an MNE indexed by x), firms incur a fixed cost of production in terms of labor and produce at constant marginal cost. The total amount of composite labor required to produce q_ω units of final variety or $m_{\omega(x)}$ units of intermediate inputs for MNE x is:

$$\ell_\omega = \frac{q_\omega}{z} + f_{ii}, \tag{3}$$

$$\ell_{\omega(x)} = \frac{m_{\omega(x)}}{z} + f_M, \tag{4}$$

where f_{ii} is the fixed cost that firms in i incur to produce final varieties sold in the same country i and f_M is the fixed cost to produce an MNE-specific intermediate input. Composite labor is given by (1), with relative demand for high and low-wage workers common to all firms and denoted $\{\alpha_i^t\}$. Firms may also export their final variety, in which case they face fixed costs of exporting f_{ij} for $i \neq j$ and variable costs of exporting in the form of iceberg trade costs ϱ. The presence of fixed costs in production and exporting leads to firm selection, à la Melitz (2003). We assume that fixed costs are ordered such that firms that serve MNEs are the most positively selected followed by firms that export and lastly firms that only serve the domestic market.[8]

MNEs The subsidiary of MNE x produces M_x in Home combining local labor and a set of intermediate inputs Ω_x sourced locally, according to the CES production function:[9]

$$M_x = \left(\xi \ell_x^{\frac{\sigma-1}{\sigma}} + \int_{\Omega_x} m_\omega^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}}. \tag{5}$$

The parameter ξ shifts demand for labor compared to intermediate inputs. Composite labor ℓ_x is given by (1), with demand shifters for high and low-wage workers that can differ from the one faced by firms and are denoted $\{\alpha_M^t\}$. The corresponding CES cost index for the MNE subsidiary is denoted R_x. The MNE headquarters located in Foreign imports M_x from its subsidiary subject to an iceberg trade cost ϱ and markets it as a final good q_x, i.e.: $q_x = M_x/\varrho$. The headquarters can sell in Foreign or export the final good to Home, subject to iceberg trade costs ϱ. MNEs act as monopolistic competitors, and their profits are distributed to workers in Foreign.

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[8]For tractability, we do not explicitly model a traded vs. non-traded sector, where service providers sell to MNEs without exporting. Our calibration accounts for this, as we discuss in Section 5.2.

[9]We assume a common elasticity of substitution in Home production and intermediate inputs, which simplifies the analysis. Appendix A.6.2 provides the full derivations in the case when the two elasticities are allowed to differ.

Market structure The baseline model assumes that all product markets are monopolistically competitive. We also assume that the labor market is competitive. We explore alternative assumptions on market structure below, as we analyze the potential impact of RS policies.

2.2 Responsible sourcing

Starting from this baseline, we model the introduction of RS policies by MNEs as a set of parameters $\left(\hat{\tau}_R^l, \hat{T}_R, \hat{d}_R, \beta\right)$ defined in detail below. At the heart of these policies is the imposition by MNEs of higher labor-related costs on their suppliers, as we describe first. We then consider several alternative hypotheses about the market environment in which RS is implemented and the MNE's motivation behind RS. The impact of RS on the Home market depends on the perimeter of the policy as well as on parameters of conduct that we describe below and estimate in Section 5.1.

Labor costs at suppliers We assume that MNEs ask their suppliers to incur labor costs that are higher than the prevailing market wage. This could capture both reduced hours at the same salary (through e.g., paid sick leave, maternity leave, etc.), higher labor-related operating costs (through e.g., safety standards or mandatory training workshops) and/or higher hourly wages. In addition, we assume that this increase in labor costs is binding for low-wage workers, but not for high-wage workers. Finally, in accordance with standard RS practices described in Section 3, a local firm that is part of an RS supply chain has to apply the same labor standards to all of its production, including sales to non-RS buyers. This translates into the model formally as follows. Denoting $w_{H,r}^t$ the wage of workers of type t working at Home firms whose RS status is $r = R$ (for RS-firms) or $r = N$ (for Non-RS-firms), we have:

$$w_{H,R}^t = \tau_R^t w_{H,N}^t \quad \text{for } t = h, l, \tag{6}$$

where $w_{H,N}^t$ is the market wage for type-t workers at Home. The parameters $\left\{\tau_R^t\right\}_{t=l,h}$ capture the net increase in the labor cost of workers at RS-suppliers. Specifically, we assume that $\tau_R^l \geq 1$ for low-wage workers while $\tau_R^h = 1$ for high-wage workers as the policy is non-binding for them.

Labor costs at the MNE subsidiary In addition to relying on suppliers, MNE subsidiaries directly hire local employees. We allow for the labor policies that impact these employees to be different from the ones in place at Home firms. Formally, let $w_{M,r}^t$ denote the cost of labor for worker type t in an MNE subsidiary with RS status $r = R, N$. We assume $w_{M,r}^t = \tau_{M,r}^t w_{H,N}^t$, where $\tau_{M,r}^t \geq 1$ captures the potential wage premium for type t in an MNE of RS status r. In our baseline specification, we maintain the assumption that all MNEs pay their employees at a premium, whether or not these MNEs implement RS, and that this premium is equal to the RS premium.[10]

In this baseline case, we assume that $\tau_{M,R}^t = \tau_{M,N}^t = \tau_{H,R}^t$ for $t = l, h$. Alternatively, in the

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[10] There is evidence that MNEs pay their employees at a premium and that labor standards at MNE subsidiaries in sourcing countries are linked to the standards at their headquarters (e.g., Hjort et al., 2020, Alfaro-Ureña et al., 2021).

counterfactual analysis in Section 5.2 we also consider the case in which MNEs put in place RS policies jointly both at their own facilities and on their suppliers, while non-RS-MNEs do not have them in place, that is:

$$\tau_{M,r}^t = \tau_{H,r}^t, \text{for } t = l, h; r = N, R. \tag{7}$$

Motivation behind RS   A natural question is why MNEs impose these cost-increasing policies on their suppliers in the first place? The literature on Corporate Social Responsibility (CSR) (e.g., Bénabou and Tirole (2010)) typically considers two views as to why firms engage in costly CSR activities: a choice made by the owners pursuing altruistic motives; or as a profit-enhancing response to an exigence of consumers, employees, or investors.[11] In our analysis, we therefore allow for the possibility that RS responds to stakeholders' demand for more equitable labor conditions in sourcing countries. We capture this force by allowing the demand shifter d_x for the variety produced by MNE x in (2) to depend positively on the presence of RS policies.[12] Formally, denoting $d_{x,r}$ the demand shock of MNE x of RS-type r, we write $d_{x,r} = d_x d_r$, with $d_N = 1, d_R \geq 1$. In the presence of this demand shifter, MNEs rolling out RS see their profits negatively impacted by higher production costs on the one hand, but they are impacted positively by the corresponding shift in demand on the other hand.

Pass-through of the cost increase   An important question, which will mitigate the effect of RS policies on Home welfare, is whether RS-induced cost increases are paid for by Home firms or by the MNE. We allow for the possibility that the labor cost increase is not fully passed through to MNE input prices by departing from the assumption of monopolistic competition in the intermediate input market. Specifically, we capture a range of possible pass-through rates of the RS policy to the input price paid by the MNE subsidiary with a reduced-form parameter $\beta \in (0, 1)$ taken to be constant across firms. When $\beta = 0$, Home firms bear the full cost of the RS policy; when $\beta = 1$ these costs increase are fully passed through to the MNE.

Increase in productivity   The RS policy described above induces a net increase in labor costs for firms hiring low-wage workers. However, it is possible that RS policies incentivize firms to make their workers more productive, or that they are accompanied by transfers of technology or expertise by the MNE to its suppliers.[13] We therefore allow for RS to be potentially accompanied by such direct changes in labor productivity. We define labor productivity gains associated with RS as $T_R \geq 1$ and assume that they impact the productivity of all workers of the firm affected RS and are paid to workers. Denoting $\tilde{w}_{H,R}^t$ the compensation paid to a type t worker by a supplier

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[11] See also Besley and Ghatak (2007), Campbell (2007), Hart and Zingales (2017), Eichholtz et al. (2010), Fioretti (2020) for analyses of conflicts and complementarities between firms' objectives and social responsibility.

[12] Results would be qualitatively similar if we allowed for an effect on foreign investment or foreign employees' effort.

[13] See e.g., Verhoogen (2016) for a case in which labor standards improved productivity.

adopting RS policies, we therefore have:

$$\tilde{w}^t_{H,R} = T_R \tau^t_R w^t_{H,N}, \text{ for } t = l, h. \tag{8}$$

From the point of view of suppliers, the net labor costs $w^t_{H,R}$ incurred for high- and low-wage labor per efficiency unit are still given by equation (6). That is, τ^l_R measures the pure labor cost increase on low-wage workers faced by an RS supplier, net of any labor productivity gains.

Labor market power   Finally, RS policies may be implemented to raise wages in a context where they are too low to begin with. In our baseline model, labor markets are competitive so that wages are those that clear the market, and are not too low from an efficiency perspective: raising these wages introduces, *a priori*, a distortion. Alternatively, it could be that Home firms exert market power on the Home labor market, marking down wages compared to an efficient benchmark. In this case, raising wages through RS may partially offset the inefficiency stemming from labor market power. In Appendix A.5, we extend the model to feature an upward-sloping labor supply curve that Home firms are facing, resulting in markdowns compared to the marginal revenue of labor in the baseline equilibrium without monopsony power. In the next section, we discuss how the comparative statics of RS differ between our baseline and this labor monopsony case.

2.3   Impact of RS policies: comparative statics

We now examine how firm-level outcomes are impacted by the rollout of RS, with the empirical application of Section 4 in mind. We assume that some MNEs implement RS while others do not, and consider the implementation of a small RS policy. Specifically, using hat notations $\hat{y} = d\log y$ to denote log changes in variable y, we derive comparative statics by computing the effect of RS summarized by $\left(\hat{\tau}^l_R, \hat{T}_R, \hat{d}_R, \beta\right)$ as defined above. In the comparative statics we present here, we compare first-order changes in the outcomes of firms "exposed" to RS by their MNE buyer—i.e., firms that sell to the MNE when RS is not yet implemented—to changes in outcomes of *ex ante* similar firms that sell to MNEs that do not implement RS. Table 1 provides a qualitative summary of the comparative static predictions of the model regarding the impacts of RS policies.

Consider the suppliers of an MNE that puts in place an RS policy. There are two types of responses to the policy—on the extensive and the intensive margin. To separately measure them, we consider the impact of RS on two groups of firms: *compliers* and *exposed* firms. Compliers are the subset of exposed firms that continue to sell to the MNE after its RS policy rollout, and hence reveal the effect of RS on the intensive margin. Compliers see their sales impacted by the increased labor costs, both on the intermediate input market and the final good markets. Exposed firms include these compliers as well as non-compliers, that is, firms that would supply the MNE absent RS but choose not to sell to the MNE after it implements RS.[14] The comparative statics that

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[14]Given the ordering of fixed costs, non-compliers keep on supplying non-RS buyers in the final goods market (i.e.,

pertain to exposed firms thus capture both the intensive and extensive margin effects of RS.[15]

Notation Let $y_{ij,r}^t$ denote outcome y of an entity with RS status r, and for workers of type t. When $i = H$, then $y_{ij,r}^t$ refers to a Home firm producing for destination market $j = H, F, M$ (respectively: Home, exports to Foreign, or production of inputs for MNE subsidiaries).[16] When $i = M$, then $y_{M,r}^t$ refers to the production of MNE subsidiaries at Home. Market-level aggregates are denoted with capital letters. Finally, $y_{ij,r}$ without superscript t sums outcomes across worker types $\left(y_{ij,r} = \sum_{t=l,h} y_{ij,r}^t \right)$ and $y_{i,r}^t$ without j subscript sums outcomes across all the production lines of a firm $\left(y_{i,r}^t = \sum_{j=H,F,M} y_{ij,r}^t \right)$. Similarly, Y_{ij}^t without subscript r sums outcomes across firms of all status $\left(Y_{ij}^t = \sum_{r=R,N} Y_{ij,r}^t \right)$.

Impact on compliers Complying firms see their labor costs increase, and workers at complying suppliers see their labor compensation increase. Workers' compensation is impacted by RS due to the labor cost wedge as well as the potential productivity gain that accompanies RS. Defining $\bar{w}_{H,r}^t$ the average compensation of workers of type $t = l, h$ across firms of type $r = R, N$, the relative effect of RS on workers' compensation is simply:

$$\hat{\bar{w}}_{H,R}^l - \hat{\bar{w}}_{H,N}^l = \hat{T}_R + \hat{\tau}_R^l, \tag{9}$$

$$\hat{\bar{w}}_{H,R}^h - \hat{\bar{w}}_{H,N}^h = \hat{T}_R. \tag{10}$$

These comparative statics imply that the productivity effect of RS, $\hat{T}_R$, can be measured by tracing out the relative effect of RS on high-wage workers' compensation (equation (10)). They also offer a possible strategy to estimate the labor cost shock $\hat{\tau}_R^l$ by tracing out the relative effect of RS on low-wage workers' compensation, net of the productivity effect (equation (9)). We will come back to this and alternative strategies to estimate the size of the RS cost shock in Section 5.1. The relative change in low-wage labor costs compared to high-wage labor costs at RS compliers leads to the reallocation of workers, which identifies the elasticity ρ as follows:

$$\hat{\ell}_{H,R}^l - \hat{\ell}_{H,R}^h - \left(\hat{\ell}_{H,N}^l - \hat{\ell}_{H,N}^h \right) = -\rho \hat{\tau}_R^l. \tag{11}$$

Turning to supplying firms, the relative impact of RS on their marginal costs is $\hat{W}_{H,R} - \hat{W}_{H,N} = \chi_H^l \hat{\tau}_R^l$, where $\chi_H^l = \frac{\alpha_H^l \left(w_{H,N}^l \right)^{1-\rho}}{W_{H,N}^{1-\rho}}$ is the cost share of low-wage types before the RS rollout. The quantity $\chi_H^l \hat{\tau}_R^l$ measures the size of the RS cost shock for RS-suppliers. Allowing for MNE buyer market power, a share β of this cost increase is passed through to the price of intermediate inputs sold to the MNE, while the final goods market is assumed to be monopolistically competitive so that the cost increase is fully passed through to domestic and export prices. As a result, the relative impact of RS on firms' output prices is:

$$\hat{p}_{Hj,R} - \hat{p}_{Hj,N} = \chi_H^l \hat{\tau}_R^l, \quad \text{for } j = H, F,$$

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their production does not drop to zero when exiting intermediate sales to the MNE).

[15]The model does not feature an entry margin to supplying to the RS-MNE (among firms not already supplying *ex ante*). We also find no evidence in support of this margin in the empirical analysis in Section 4.

[16]Notations are symmetric for Foreign.

$$\text{while} \quad \hat{p}_{HM,R} - \hat{p}_{HM,N} = \beta \chi_H^l \hat{\tau}_R^l, \quad \text{for the RS-MNE market.}$$

In turn, the sales of complying suppliers on both markets are impacted as follows:

$$\hat{y}_{Hj,R} - \hat{y}_{Hj,N} = (1 - \sigma) \chi_H^l \hat{\tau}_R^l < 0, \quad \text{for } j = H, F, \tag{12}$$

$$\text{while} \quad \hat{y}_{HM,R} - \hat{y}_{HM,N} = (1 - \sigma) \beta \chi_H^l \hat{\tau}_R^l + \hat{d}_R, \quad \text{for the RS-MNE market.} \tag{13}$$

Equations (12) and (13), which we will take to the data, show that sales react negatively to the change in prices, with elasticity $(1 - \sigma)$. Of course, the sales impact reflects the price impact above, and in particular the imperfect pass-through β. In addition, on the RS-MNE market, suppliers benefit indirectly from the potential positive demand shock associated with RS that increases the relative demand for RS-MNE final goods, all else equal.

Comparing compliers' sales responses on the RS-MNE market vs. the rest of their sales is therefore informative to estimate β. The lower the pass-through of the RS policy to input prices, the less affected are sales to the RS-MNE compared to other sales. In addition, this comparison is also informative about the size of the demand shock. If, for instance, one were to observe a *positive* effect of RS on the intensive margin of sales to the RS-MNE, one could conclude that there exists a large enough positive demand shock associated with RS (compared to the input price shock) that dominates the impact of RS on sales. If, on the other hand, one observes a less negative effect of RS on these sales (compared to the negative effect of RS on sales on other markets), this difference is informative about β and $\hat{d}_R$ but they are not separately identified at this point. We use additional comparative statics below to disentangle β and $\hat{d}_R$.

Lastly, note in equation (12) that the sales of compliers to buyers other than the RS-MNE itself are unambiguously negative. This qualitative moment will be useful to discriminate our baseline model from the alternative model with labor monopsony, as we discuss at the end of this section.

Impact on exposed firms Consider next the impact of the policy on the group of exposed firms, including both compliers and non-compliers, hence both the intensive and the extensive margin responses to the policy. The total effect of RS on the sales of exposed firms by market is:

$$\hat{Y}_{Hj,R} - \hat{Y}_{Hj,N} = (1 - \sigma) \chi_H^l \hat{\tau}_R^l < 0, \quad \text{for } j = H, F, \tag{14}$$

$$\hat{Y}_{HM,R} - \hat{Y}_{HM,N} = [\underbrace{\beta(1 - \sigma)}_{\text{intensive}<0} + \underbrace{\sigma \frac{\sigma - 1 - \theta}{\sigma - 1}}_{\text{extensive}<0}] \chi_H^l \hat{\tau}_R^l + \underbrace{\frac{\theta}{\sigma - 1}}_{\text{int+ext}>0} \hat{d}_R. \tag{15}$$

On the domestic market, the first-order effect of RS is simply the intensive margin response. This is because when RS hits, firms may respond on the extensive margin by dropping out of the relationship with the RS-MNE, but even when they do so, they remain active selling to non-RS buyers. On the MNE market, the effect of RS on the sales of exposed firms is stronger than the intensive margin effect alone, as some firms decide to drop out of the relationship with the

RS-MNE, leading to a more negative effect of the RS cost shock on exposed firms compared to complying firms. At the same time, the positive effect of the demand shock is also amplified by the corresponding positive extensive margin response to that aspect of the RS policy.

Qualitatively, these comparative statics are similar to the ones in (12) and (13), showing that the effect of RS on exposed firms is unambiguously negative on the domestic market, while it is ambiguous on sales to the RS-MNE. Turning to the total sales of exposed suppliers, $Y_{Htot} = Y_{HM} + Y_{HH} + Y_{HF}$, they are impacted as follows (summing up equations (14) and (15)):

$$\hat{Y}_{Htot,R} - \hat{Y}_{Htot,N} = \underbrace{\left[1 - \sigma - \zeta\sigma\frac{\theta - \sigma + 1}{\sigma - 1} + (1 - \beta)\zeta(\sigma - 1)\right]}_{<0}\chi_H^l\hat{\tau}_R^l + \underbrace{\zeta\frac{\theta}{\sigma - 1}}_{>0}\hat{d}_R, \qquad (16)$$

where $\zeta \equiv \frac{Y_{HM}}{Y_{Htot}}$ is the share of firm sales that correspond to MNE inputs prior to RS. Total firm sales combine the intensive and extensive margin effects of RS. The extent of the latter is governed in the model by the shape parameter of the productivity distribution θ, that governs the strength of selection effects and the extensive margin response to the imposition of RS.[17] Combining the intensive-margin response with that in total firm sales is therefore informative to estimate the model parameter θ. In practice, in the data we observe Consistent with the discussion above, in our calibration, this moment (16) helps pin down the parameter θ that governs the selection effect and the extensive margin responses.

Impact on the MNE subsidiary   Finally, it is also useful to consider the relative impact of RS on the total sales of MNE subsidiaries themselves, $R_r M_r$ for an MNE of type r:

$$\widehat{R_R M_R} - \widehat{R_N M_N} = \underbrace{\left[\beta(1 - \sigma) - \frac{\sigma(\theta - \sigma + 1)}{\sigma - 1}\right]}_{\text{suppliers}<0}\Xi\chi_H^l\hat{\tau}_R^l + \left[\underbrace{1}_{\text{direct}} + \underbrace{\Xi\frac{\theta - \sigma + 1}{\sigma - 1}}_{\text{suppliers}>0}\right]\hat{d}_R, \qquad (17)$$

where $\Xi = \frac{\int_{\Omega_x} p_{HM}(\omega(x))^{1-\sigma}}{R^{1-\sigma}}$ is the cost share of intermediate inputs for MNE subsidiaries before an RS rollout. On the one hand, MNE sales are negatively impacted by RS through the input cost shock $\hat{\tau}_R^l$, although this negative impact is mitigated both by the extent of pass-through β and by the fact that RS affects only a share Ξ of the MNE input costs. On the other hand, MNE sales can also be positively affected through the potential demand shift $\hat{d}_R$. Therefore, this moment is informative about both β and $\hat{d}_R$, just like the moments that summarize the intensive margin among compliers' sales above (equations (12) and (13)). However, the partial pass-through β and the demand shock $\hat{d}_R$ have differential relative impacts on these two outcomes,

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[17]The relative change in the productivity cutoff for serving the MNE market is: $\hat{z}_{HM,R}^* - \hat{z}_{HM,N}^* = \frac{\sigma}{\sigma-1}\chi_H^l\hat{\tau}_R^l - \frac{1}{\sigma-1}\hat{d}_R$. On the final goods market, however, we have: $\hat{z}_{Hj,R}^* - \hat{z}_{Hj,N}^* = 0$ for $j = H, F$, because only infra-marginal firms are impacted by RS.

because the demand shock impacts the RS-MNE sales both directly (through increased demand) and indirectly (through its effect on supplier's entry), while it impacts suppliers only indirectly. Therefore, considering them jointly allows to disentangle β from $\hat{d}_R$.

Alternative model with monopsony power   We conclude this section by summarizing our analysis of an alternative model in which wages are too low absent RS, because of labor market power among domestic suppliers. Appendix A.5 derives the impact of RS on firms' outcomes in this case and shows that the effect of increasing wages among complying suppliers is actually to increase their sales (to both the RS-MNE and non-RS buyers), rather than decrease them. Indeed, higher wages make monopsonistic firms hire more employees by moving up the labor supply curve they face as firms were voluntarily restricting their hiring by maintaining wages low absent RS. This leads to higher production and higher sales so long as the wage increase is moderate (but, of course, to lower profits). Comparative statics in this case are therefore qualitatively different from our baseline case, as summarized in Table 1.

2.4   Welfare implications of RS

The overall desirability of RS from the point of view of Home workers is *a priori* unclear: on the one hand, some workers see a wage increase, paid for at least in part by foreign MNEs and their customers, which can be beneficial. On the other hand, this policy can introduce distortions in labor and output markets, leading to efficiency losses. We use the model to derive and decompose the welfare incidence of RS on workers in the Home country. To gain intuition, we first consider a simplified version of the model, in which the welfare implications of RS can be derived and analyzed in closed form. We then derive the full set of equations that govern the welfare impact of the policy in the full model discussed above, as we report in detail in Appendix A.3.[18] We put them to use in Section 5.2, where we quantify the welfare effects of RS in the full calibrated model and present sensitivity analyses across alternative assumptions and parameter values. Throughout these analyses, we assume that a fraction $\gamma \in [0,1]$ of MNEs put in place a small RS policy $\left(\hat{\tau}_R^l, \hat{T}_R, \hat{d}_R, \beta \right)$, and focus on the first-order welfare impact of this policy.[19] We first analyze the average welfare impact of the RS policy on all Home workers, $\hat{U}_H$. We then proceed to examine the distributional impact of the policy $\left(\hat{U}_H^l, \hat{U}_H^h \right)$ on low- vs. high-wage workers and "exposed" vs. "non-exposed" workers within those groups.

Simplified setup   To characterize the forces at work in closed form, we streamline the full model in four ways. First, we simplify trade patterns: we assume that Home firms only export indirectly by selling to MNE subsidiaries, and that only non-MNE firms in Foreign export to Home (shutting

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[18]While the forces governing the simplified setup continue to govern the full model, the latter requires numerical analysis to account for, e.g., more realistic trading patterns or MNEs' direct employment of domestic labor.

[19]We find that the aggregate size of the RS shock in GDP is indeed small, in line with the first-order approach we adopt here.

down re-exports by MNEs back to Home). Second, we assume that MNE subsidiaries at Home do not employ local labor directly, i.e., $\Xi = 1$. They only use local inputs in production. Third, we follow Burstein and Vogel (2017) by taking the limit $\theta \to \sigma - 1$ to shut down Melitz-type selection, but maintaining firm heterogeneity. Finally, we assume that all MNEs implement RS, hence set $\gamma = 1$. Detailed derivations of the results we report below are given in Appendix A.4.

Aggregate welfare impact As above, we use hat notations to denote log changes in outcomes following the implementation of RS. For a worker type $t = l, h$ in Home, welfare per capita is:

$$U_H^t = \frac{1}{L_H^t} \frac{X_H^t}{P_H},$$

where X_H^t is the total expenditure of type t workers and P_H is the ideal price index, common to both types, derived from the utility in equation (2). We first analyze the average welfare impact of the RS policy on all Home workers, $U_H = \sum_{t=l,h} \frac{L_H^t}{L_H} U_H^t$, for which $\hat{U}_H = \hat{X}_H - \hat{P}_H$, where $X_H = \sum_{t=l,h} X_H^t$ is the total expenditure of country H. To report the results, we first introduce some notation. Let $\lambda_{kk'}$ denote trade shares as is standard in the literature in international trade, and let Λ denote the share of total Home expenditure that is spent on goods produced by RS-compliant firms.[20] Λ thus measures the degree of "leakage" of RS policies into the domestic price index. Finally, as before, the cost share of low-wage workers is χ_H^l, so that the direct size of the cost shock for impacted suppliers is $\chi_H^l \hat{\tau}_R^l$. With these definitions, the welfare impact of RS rollouts by Foreign MNEs at Home can be expressed as:

$$\hat{U}_H = (\beta - \Lambda) W^{tax} \chi_H^l \hat{\tau}_R^l \ + \ (\lambda_{FH} + \Lambda\lambda_{HH}) W^{prod} \hat{T}_R \ + \ \lambda_{FH} W^d \hat{d}_R, \tag{18}$$

where the sufficient statistics W^{tax}, W^{prod} and W^d are detailed below, and all positive. The first term in the sum on the right-hand side measures the welfare impact of the RS cost shock, $\chi_H^l \hat{\tau}_R^l$. The second term measures the welfare impact of the productivity shock, $\hat{T}_R$. The third (last) term measures the welfare impact of the demand shock, $\hat{d}_R$. We examine each in turn.

First, we find that the welfare impact of the RS cost shock, in isolation, is $(\beta - \Lambda) W^{tax} \chi_H^l \hat{\tau}_R^l$, where $W^{tax} = \frac{\sigma \lambda_{HH} \lambda_{FH}}{1 + (\sigma-1)(\lambda_{FF} + \lambda_{HH})}$ and $\chi_H^l \hat{\tau}_R^l$ is the size of the shock. The sufficient statistic $W^{tax} \geq 0$ is isomorphic to the first-order effect of imposing a unilateral export tax on all Home exports (e.g., Caliendo and Parro, 2021). RS may, thus, lead to welfare gains due to its labor cost increase alone, through a mechanism akin to an export tax and a classic terms-of-trade effect. This effect, however, is mitigated (or over-turned) by the degree of cost pass-through to the MNE, β, and the

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[20]Formally, we define $\lambda_{ii} = \int_{\Omega_{ii}} \left(\frac{\sigma}{\sigma-1} \frac{W_i}{z} \right)^{1-\sigma} dG_i(z) / P_i^{1-\sigma}$ and $\lambda_{ji} = 1 - \lambda_{ii}$ for $i \neq j$, where $\Omega_{ii'}$ denotes the set of varieties produced in i and marketed in i' and $\Lambda = \int_{\Omega_{HH,R}} \left(\frac{\sigma}{\sigma-1} \frac{W_H}{z} \right)^{1-\sigma} dG_H(z) / \int_{\Omega_{HH}} \left(\frac{\sigma}{\sigma-1} \frac{W_H}{z} \right)^{1-\sigma} dG_H(z)$, where $\Omega_{HH,R}$ denotes the subset of final varieties produced by firms impacted by RS.

degree to which higher costs affect production destined for domestic use, Λ. This leakage into the domestic price index is akin to a distortive tax on domestic production. RS leads compliant firms to face a wedge on their labor cost, even when they produce for the domestic market. This wedge leads to efficiency losses, and the price of consumption for Home workers increases—working against the positive effect of the export tax. At the limit, $\beta = 0$, the welfare effect of the labor cost increase due to RS becomes unambiguously negative for Home workers, for any $\Lambda > 0$: the policy is then only distortive. Similarly, when the policy "leaks" to all domestic production ($\Lambda = 1$), the welfare effect of the policy is unambiguously negative for any $\beta < 1$, as the policy becomes a distortive tax on domestic production. In the knife-edge case where $\beta = \Lambda$, the RS policy becomes welfare-neutral for Home workers.

Note that the RS policy we study shares elements with a minimum wage policy, as it imposes higher wages for low-wage workers (at some firms). However, the key features governing the welfare incidence of RS that we include here are typically absent from the existing literature on minimum wages.[21] The key ingredients that matter here—and are inherent to RS policies—are: (i) an open economy context in which RS may affect exports asymmetrically; and (ii) the fact that the take-up of the policy is optional and only applies to a targeted subset of firms and their workers. As impacted firms tend to export both indirectly (selling to MNEs) and potentially directly (positive selection), (i) implies that part of the policy's cost is paid by Foreign, leading to potential unilateral gains from the perspective of Home (akin to a terms-of-trade improvement). RS policies inherently bundle this positive effect with a distortive impact on Home production, leading to ambiguous overall effects. Through (ii), the distortive nature of RS will also differ from a standard minimum wage policy, as RS only applies to a (selected) subset of producers, giving rise to additional wedges between firms and, thus, misallocation.

The second term in the welfare expression (18) captures the effect of an increase in labor productivity due to RS, which is, unsurprisingly, unambiguously positive. The sufficient statistic $W^{prod} = \frac{(\sigma-1)\lambda_{FF} + \sigma\lambda_{HH}}{1+(\sigma-1)(\lambda_{FF}+\lambda_{HH})} \geq 0$ captures what would be the welfare effect of a productivity increase for all workers at Home. As the RS policy only applies to a fraction of workers (those at RS-compliant producers), that effect is scaled by the fraction $\lambda_{FH} + \Lambda\lambda_{HH}$. The third term in equation (18) is also unambiguously positive. The sufficient statistic $W^d = \frac{\lambda_{FF}}{1+(\lambda_{FF}+\lambda_{HH})(\sigma-1)} \geq 0$ measures the effect of a positive demand shock to what is produced at Home. This effect is then scaled by 1-λ_{HH}, capturing the share of Home production dedicated to MNE production subject to the demand shock in our simplified setup.

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[21]See Cengiz et al. (2019) for recent empirical work, Berger et al. (2022) for recent theoretical work, and Dube (2019) for a review of this literature.

Distributional implications The model also allows us to investigate the heterogeneous effects of RS across workers. First, one can show that low- and high-wage workers, in the aggregate—viewed as two representative agents, experience the same change in welfare in this simple setup, i.e., $\hat{U}_H^l = \hat{U}_H^h$. The intuition here is that GE forces have to bring back the level of wages for low-wage workers at non-RS firms to a level that restores equilibrium on the labor market, after RS is imposed. Relative supply of high and low-wage workers is unchanged after RS in our baseline setup, hence their relative labor payments must remain unchanged too, on aggregate. Since both worker types face the same change in prices, they also face the same welfare change.

We then decompose the aggregate welfare effects into the effect among exposed and non-exposed workers of each type. As in our definition of exposed firms, exposed low- or high-wage workers are defined as those who were working at suppliers to the RS-MNE before the RS rollout. We denote $\hat{U}_{H,R}^t$ the per-capita welfare gains of workers of type t exposed to RS, and $\hat{U}_{H,N}^t$ the per-capita welfare gains of non-exposed workers. The policy can have stark distributional implications within groups $t = l, h$. Specifically, the non-exposed group typically loses from the policy. In fact, unless RS triggers a large enough positive demand shock (third term in (18)), this group systematically loses. Formally, we find that, for non-exposed workers, the welfare impact of RS is:

$$\hat{U}_{H,N}^t = \underbrace{\left[(\beta - \Lambda) W^{tax} \chi_H^l - \lambda_{FH} + \Lambda \lambda_{HH} \right]}_{<0} \hat{\tau}_R^l + \underbrace{(\lambda_{FH} + \Lambda \lambda_{HH}) \left(W^{prod} - 1 \right)}_{<0} \hat{T}_R + \lambda_{FH} W^d \hat{d}_R,$$

while for exposed workers $\hat{U}_{H,R}^t - \hat{U}_{H,N}^t = \hat{\tau}_{H,R}^t + \hat{T}_R$. Directly impacted workers may benefit from RS even in a scenario with incomplete pass-through β and leakage to the local price index Λ, and they always do when aggregate welfare gains are positive. In contrast, the overall labor market consequences of RS are negative for non-exposed workers due to GE effects on wages (reduced aggregate demand for low-wage workers) and leakage into the domestic price index. The only source of welfare gains for non-exposed workers is the demand shock which, in GE, impacts wages favorably for all Home workers. In our quantification we will report welfare results across both types of workers and exposed vs. non-exposed workers within those groups.

3 Data and context

3.1 Administrative data from Costa Rica

Firm-to-firm transaction data This dataset tracks the near-universe of formal firm-to-firm relationships in Costa Rica (henceforth, CR) between 2008 and 2019.[22] This information is collected by the Ministry of Finance through the D-151 tax form. Firms must report the tax identifier of all their suppliers and buyers with whom they generate at least 2.5 million Costa

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[22]Alfaro-Ureña et al. (2022) and Alfaro-Ureña et al. (2021) describe in detail all administrative data from Section 3.1.

Rican colones (around 4,000 U.S. dollars) in transactions that year, in addition to the total amount transacted. We use these data both to identify the suppliers exposed to a new RS policy of an MNE subsidiary in CR and to estimate effects on different types of sales transactions.

Matched employer-employee data   Based on data from the CR Social Security Administration, we construct a panel of employment records for all formal workers in CR between 2006 and 2019. We observe (at least once) 1.9 million individual workers. For each worker, these data record employer identifiers that we can link to the other datasets, monthly labor earnings, full-time or part-time employment status, and maternity leave status.

Other firm-level data and the MNE sample   We then add from the Ministry of Finance the yearly corporate income tax returns from 2008-2019 for all taxpaying firms in CR. These returns contain typical balance sheet variables, such as total sales and employment. In addition, they also track the primary 4-digit industry of each firm (out of a total of 375 4-digit industries observed in CR). Moreover, we bring in data from CR customs declarations on yearly firm-level imports and exports. Finally, we use a comprehensive dataset on firm-level foreign ownership combining information from annual surveys conducted by BCCR, reports of firms active under the Free Trade Zone regime, records of the investment promotion agency of CR (CINDE), and Orbis from Bureau van Dijk (allowing us to confirm which foreign-owned firms in CR are part of an MNE group). For each MNE subsidiary, we identify its MNE group and link the subsidiary to the RS policies put in place at the group level. We then focus our analysis on the 481 MNEs with a subsidiary in CR whose total average yearly input purchases exceed 1 million U.S. dollars (where the average is computed across all years of operation of that subsidiary in CR).[23] As Appendix Table B1 shows, these 481 subsidiaries account for 80% of MNE input purchases and 85% of total sales.

3.2   Global data on MNE groups

Orbis data   We link MNE subsidiaries in CR to historical Orbis panel data about their MNE group. As global MNE sales, we use the consolidated turnover of the global ultimate owner of the subsidiaries in CR (according to the ownership module of Orbis). Through this procedure, we observe the global sales of 204 of the 481 MNEs of interest over the sample period 2008-2019.[24]

Sigwatch data   The consultancy firm Sigwatch collects detailed information on international consumer-facing NGO campaigns focused on MNE production practices, including their sourcing practices (Hatte and Koenig, 2020).[25] Between 2010 and 2020, Sigwatch records on average more than 10,000 NGO campaigns per year. After matching the MNEs both by name and ISIN

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[23]We consider an MNE subsidiary as a firm with positive MNE ownership. Most subsidiaries are fully owned by the MNE, and the median ownership share is around 95%.

[24]The matching rate with Orbis sales data is constrained by its varying geographical coverage (which tends to be lower outside Europe and North America).

[25]We thank Pamina Koenig for making these data available to us.

identifiers, we observe the NGO campaigns for 191 of the 481 MNEs of interest. We use these data to investigate whether negative NGO campaigns against MNEs tend to precede their RS rollouts.

BoardEx data   We combine data from BoardEx and Orbis to track leadership changes at the MNE group level. BoardEx and Orbis provide us with the identity of all current and previous workers in key leadership positions in the MNEs of interest, together with their date of appointment and resignation from a given position. From the two datasets combined, we can identify leadership changes in 271 of the 481 MNEs of interest. We use this data to check whether RS rollouts might be systematically associated with prior MNE-level leadership changes.

3.3   Responsible sourcing (RS) codes and policy context

Data construction and analysis sample   We construct a new database that tracks the RS policies rolled out by the 481 MNEs with a subsidiary in CR we describe above. To build these data, we implemented a double-blind search process by two independent research teams whose output we then cross-check and consolidate into one final database. For each MNE, we searched for information about corporate social responsibility and supplier requirements in all its publicly-available company reports and publications, press releases, and corporate filings. This information was mainly found on the website of the MNE group. In addition, for each MNE, we conducted online searches in both CR and international media outlets to gather additional information on rollouts. For each RS policy, we recorded the year of implementation, whether the policy was MNE-wide (introduced by the MNE headquarters for suppliers to subsidiaries worldwide) or specific to CR (or the Central American region), and a number of additional details we describe below. Given that 2008 is the first year when we observe firm-to-firm transaction data to evaluate supplier linkages, we focus the search on RS rollout events over the 2009 to 2019 period. In the analysis, we focus on RS requirements that include provisions on working conditions, broadly defined.[26] Requirements on working conditions tend to be the main component of RS policies.[27] Working conditions are also at the center of the RS policies in our analysis sample, based on the space and detail devoted to working conditions imposed on suppliers. More systematically, we find that the top five most common words used in the text of the RS codes in our sample (after removing neutral expressions such as "the", "a", etc.) are "suppliers", "safety", "rights", "code" and "labor". "Wages" and "compensation" are in the top 15 most frequent words in the RS codes (and mentioned more frequently than "workers"). As summarized in Appendix Table B2, the analysis sample consists of 165 RS policy rollouts by 135 distinct MNEs. Of these 135 MNEs, 84% have

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[26]In practice, 88% of all RS rollout events we identified fall in this category.

[27]A survey conducted by The Economist Intelligence Unit among 800 MNE executives shows that workplace safety, working hour limits, minimum wages and compensation for injury/sickness are the areas most frequently addressed by RS policies. See report here.

only one RS policy rollout between 2009 and 2019.[28] 85% of these RS rollouts apply to the entire MNE group (suppliers worldwide).

Policy context   Combining the firm-to-firm transactions with the RS rollouts by MNEs with subsidiaries in CR, we first measure the extent of RS exposure as the fraction of production by domestic (non-MNE) firms that are subject to active RS supplier codes.[29] That fraction increased from 25% in 2009 to 38% in 2019. The prevalence of RS in domestic production and its increase over time suggest that the incidence on workers may extend beyond directly affected firms and workers, motivating an analysis that goes beyond comparative statics in partial equilibrium.

Appendix Tables B3 and B4 provide descriptive statistics about MNEs rolling out RS policies and their suppliers. Subsidiaries of MNEs with RS rollouts are larger than other MNE subsidiaries in CR and are more likely to be headquartered in the US and the EU. Exposed suppliers (defined as those supplying to the MNE subsidiary the year before its RS rollout) have an average (median) of 30 (8) employees. 14% of exposed suppliers operate in the manufacturing sector, 52% in services, 29% in retail (including, e.g., repair and maintenance services) and 4% in agriculture.

An example of a typical RS event in our analysis sample is Panasonic's 2016 "Supply Chain CSR Promotion Guideline", which applied to all suppliers of Panasonic globally.[30] Panasonic's RS code lays out a comprehensive list of its suppliers' requirements vis-à-vis their workers, covering working hours (e.g., workers must be allowed to take at least one day off per seven working days), living wages (e.g., suppliers must comply with minimum wage laws and pay workers without delay), freedom of participation (e.g., workers can organize and join a labor union), occupational safety standards and training, emergency preparedness and training, work-related injuries and illness, and industrial hygiene, among other provisions.

Compliance with local labor laws and regulations is a common minimum requirement of RS rollouts, above which MNEs can impose stricter requirements.[31] If local laws are strong and well-enforced, RS rollouts may be redundant. Conversely, if local laws are strong but not well-enforced, then even the least ambitious RS codes—only requiring adherence to local laws and regulations—can have meaningful implications for suppliers if the private enforcement of RS improves the previous oversight by public regulators. Our empirical context resembles this latter scenario: there is a national minimum wage among low-skill occupations that is about 70% of the

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[28]Of the 165 RS rollouts, 94% involve a new supplier code of conduct. Among the remaining 6%, six RS policies involve a recurrent workshop (training course or consultancy) for suppliers, three involve a recurrent meeting event or awards ceremonies for suppliers, and one involves a one-off workshop (training course or consultancy) for suppliers.

[29]The numerator is the sum of the sales of all CR non-MNE firms that are selling to an MNE subsidiary with an active RS code that year.

[30]See document here.

[31]E.g., Microsoft's 2011 "Vendor Code of Conduct imposes a "limit of 60 hours of work per week, even if local law allows more" (see here). Similarly, Panasonic's 2016 RS code requires a maximum 60-hour workweek, adding: "Any local law or regulation shall apply if it is stricter than this provision" (see here).

median wage, a higher percentage than in all OECD countries (OECD, 2017). Moreover, at 36.5% of gross salaries, CR's Social Security contributions are higher than the OECD average (27.2%). Employer contributions are notably high (26.3%)—the OECD average is 17.7% (OECD, 2016).

Enforcement of these labor laws in CR, however, has been weak. CR's chief enforcement process relies on state-employed labor inspectors whose job is to investigate potential violations of minimum wages, Social Security payments, payroll records, occupational risk, insurance payments, mandated maternity leave, holidays, overtime pay, working-time regulations, and health and safety regulations. In 2015, there were 92 labor inspectors in CR (or 0.4 inspectors per 10,000 employees), who reportedly lacked basic resources (e.g., Gindling et al., 2015). According to the Ministry of Labor, their staffing level is insufficient to even inspect 10% of firms, with small and medium enterprises effectively operating outside of public enforcement (La Nación, 2009). In line with these reports, there is evidence that even toward the end of our sample, in 2017, one quarter of formal sector employees (and the majority of informal employees) earned less than the legal minimum wage (OECD, 2017). Weak enforcement of existing regulations is not specific to CR, of course, and is widespread in low- and middle-income countries (e.g., Harrison et al., 2003).

Due to MNE resources and private incentives not to be caught lying about advertised sourcing practices, the enforcement of RS requirements by MNEs is likely to be, on average, significantly more effective than the *status quo* of public oversight and enforcement. According to The Economist Intelligence Unit MNE survey, to ensure compliance, MNEs subject suppliers to regular on-site inspections (which are commonly contracted to third-party auditors). This is consistent with the provisions in our analysis sample of RS codes: the word "compliance" is among the top 15 most frequent words in these codes.[32] But, of course, the many detailed assessment and compliance provisions included in RS codes could in principle just be "hot air". In that case, we would not expect to find significant impacts on exposed suppliers. The following empirical analysis—including the quantification in our analysis sample of the average increase in supplier production costs due to RS rollouts—will help shed light on these questions.

4 Empirical evidence

In this section, we use the database described above to provide evidence on the effects of RS rollouts by MNEs on suppliers (firms), workers, firm-to-firm transactions and the MNEs themselves. In Section 5.1 we then combine these estimates with the model's comparative statics from Section 2.3 to rationalize the evidence through the lens of the theory and to calibrate the

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[32]E.g., Walmart's "Audit and Assessment Policy and Guidance" includes: "choosing an appropriate third party audit program from the list of Walmart-approved programs, contacting the audit program chosen, arranging for the audit, paying for the audit, having an audit conducted by an APSCA-registered auditor, cooperating with the audit firm and/or program to complete the audit, sending the results to Walmart within the specified timelines, and working with the audit program and facility to remediate non-compliances and to resolve issues." See document here.

model for counterfactual analysis.

4.1 Empirical strategy

Firm-level specifications   We estimate event-study specifications of the following form:

$$y_{ist} = \alpha_i + \gamma_{st} + \sum_{\eta=k_l}^{\eta=k_u} \beta_\eta I(\text{Years since RS}_{it} = \eta) + \epsilon_{ist} \,, \tag{19}$$

where y_{ist} is an outcome (e.g., log firm sales or log employment) of firm i from the sample of firms who are suppliers to MNE subsidiaries in CR at some point over the sample period 2008-2019. The subscript s indexes the 375 4-digit sectors in CR and t indexes years, α_i are firm fixed effects and γ_{st} are sector-by-year fixed effects.

The term $\sum_{\eta=k_l}^{\eta=k_u} \beta_\eta I(\text{Years since RS}_{it} = \eta)$ captures the event-study design: $I(\cdot)$ is an indicator function and η indexes the number of years before or after the rollout of the RS policy by the MNE that is linked to the firm.[33] Following the theory, we define exposure to a given RS rollout (RS_{it}) for domestic firms that were selling to the MNE in question in the year before the rollout (at $\eta = -1$). For suppliers that were exposed more than once during our sample, we focus on the effects of first-time exposure to an RS rollout. To adjust for autocorrelation across years for the same firm, we cluster the standard errors (ϵ_{ist}) at the level of firms i. In the results below, we estimate and report the event studies both before and after pooling the point estimate at $\eta \geq 4$ side-by-side (i.e., showing the point estimate for $\eta = 4$ in a specification without pooling, and for $\eta \geq 4$ from a specification with pooling longer-run effects, everything else left unchanged).

The primary identification concern for estimating the β_η coefficients is that the timing of the RS rollouts may not be as good as random from the perspective of CR suppliers. For instance, MNEs may have rolled out their RS policies during periods when CR suppliers experienced other contemporaneous shocks (e.g., to their productivity). We address this concern in several ways. First, to limit concerns of different time trends across different types of firms, we restrict the estimation sample to only CR firms that have been suppliers to MNE subsidiaries in CR at some point during the estimation sample 2008-2019.

Second, we assess the presence of confounding shocks that may have preceded the MNE's RS rollout decision using the event-study design (documenting the β_η both before and after the rollout). To do so convincingly, we build on recent advances in the applied econometrics literature on difference-in-difference (DiD) estimation with "staggered" treatment events. Several papers have shown that estimating the specification in (19) with two-way fixed effects regressions

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[33]We include all periods η observed in the sample (i.e., $k_l = -11$ and $k_u = 10$) except the omitted period at $\eta = -1$, and we report estimates for $\eta \geq -4$ and $\eta \leq 4$ in the figures and tables.

can fail to recover average treatment effects even if the treatment events are randomly assigned.[34] This can happen when treatment effects are dynamic, as already-treated units enter the control group in a given period. In our context, the concern would be that firms exposed to RS earlier (e.g., around 2010) may experience systematically different dynamic effects compared to firms exposed in later years (e.g., 2015-2019). Moreover, the two-way fixed effects estimation produces variance-weighted averages of potentially heterogeneous treatment effects, complicating their interpretation and link to theory. Next to the standard two-way fixed effects event-study estimates, we thus report estimates from the procedure developed by Sun and Abraham (2020)—who focus on event-study designs with leads and lags of treatment indicators. In particular, their method estimates the dynamic effect for each treatment cohort separately, and calculates the weighted average of these cohort-specific effects with weights equal to each cohort's sample size.

Third, we present the event study both before and after using only RS rollouts in other MNE sourcing countries (due to global RS rollouts) as instruments for rollouts among CR suppliers. Using RS rollout decisions that were made by the MNE headquarters, covering all supplier relationships worldwide, as an IV aims to address the concern that RS rollouts could still have been targeted at the point in time during which CR suppliers started to experience contemporaneous shocks (without showing up in pre-trends).[35] To further explore the MNE-level context of RS rollout decisions, we also estimate event studies with MNE outcomes on the left-hand side of equation (19), where firm i is now the subsidiary in CR of the MNE that rolls out RS and the event-study timeline I(Years since $RS_{it} = \eta$) traces MNE subsidiary outcomes in the years before and after a given RS rollout.[36] We also match the MNE subsidiaries in our sample to panel data on the corresponding global outcomes of the MNE in the Orbis database. This allows us to check if local CR subsidiary sales respond differently from global MNE sales (suggesting substitution across sourcing countries as we discuss in Section 2 and Appendix A.6.4). Furthermore, we use the Sigwatch data to test whether RS rollouts may have responded to negative publicity campaigns in the years prior to the RS rollout decision, and we use the BoardEx data to test whether RS rollouts occur after MNEs change leadership positions.

Finally, our definition of rollout exposure in RS_{it} can give rise to a somewhat mechanical bias in the estimation of the event-study coefficients: given that supplier sales to MNEs can be subject to annual fluctuations for many reasons, defining exposure to RS in terms of a positive MNE sales event in year $\eta = -1$ may on average pick up particularly successful or lucky periods

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[34]See De Chaisemartin and d'Haultfoeuille (2020), Sun and Abraham (2020), Borusyak et al. (2021), Goodman-Bacon (2021), Roth and Sant'Anna (2021).

[35]Also note that our theory in Section 2 and quantitative analysis in Section 5 allow for contemporaneous effects on MNE output (and thus their input demand from suppliers).

[36]Focusing, as above, on first-time rollouts in case the same MNE experienced multiple rollouts during our sample period.

for the exposed suppliers. This lumpy nature of sales could give rise to positive pre-trends and negative post-trends even in the absence of any actual impacts of RS. To address this concern, we estimate the specification in equation (19) both before and after including an additional set of event-study indicators, $\sum_{\eta=-4}^{\eta=4} \delta_\eta I(\text{Years since MNE}_{it} = \eta)$, where the η years are identical to the RS event-study years and MNE_{it} switches to unity for all CR suppliers that had active sales relationships to any MNE in CR in event year $\eta = -1$ (one year before the RS policy was rolled out). When including these additional event-study terms in equation (19), we thus estimate the event study of RS rollouts among exposed CR suppliers after controlling for the full timeline of potential effects that may stem from having had a positive sales relationship to any MNE at the event time $\eta = -1$.

Worker-level specifications   Next, we estimate the effects of RS rollouts at the level of individual workers using the matched employer-employee data. We adapt the event-study strategy outlined above to include a richer set of fixed effects that reflect the change in the dimensionality of the worker-level panel data. We estimate event-study specifications of the following form:

$$y_{ijst} = \alpha_{ij} + \gamma_{st} + \sum_{\eta=k_l}^{\eta=k_u} \beta_\eta I(\text{Years since RS}_{jt} = \eta) + \epsilon_{ijst} , \qquad (20)$$

where α_{ij} are now fixed effects for worker (i)-by-firm (j) pairs. γ_{st} and $\sum_{\eta=k_l}^{\eta=k_u} \beta_\eta I(\text{Years since RS}_{jt} = \eta)$ remain defined as the sector-by-year fixed effects of the employing firm j and the firm (j)-level RS event-study terms. As above, we estimate this specification before and after including the full timeline of effects for having sold to any MNE (to address any mechanical biases discussed above), using the IV specification, and using the estimation procedure by Sun and Abraham (2020). We continue to cluster the standard errors at the level of firms (j here).

As outcome y_{ijst}, we focus on the log monthly earnings of workers—measured as their annual earnings divided by the number of months of employment. Given the α_{ij} fixed effects, the β_η estimates capture potential changes in the labor earnings of continuing workers at exposed suppliers (relative to continuing workers at non-exposed suppliers).[37]

Transaction-level specifications   To estimate the effect of RS on the intensive margin of sales to the MNE, we estimate event-study specifications at the firm-to-firm transaction level. We create an estimation sample that only includes firm-to-firm transactions where the buyer is any MNE subsidiary in CR. We then estimate the same specification as in equation (20), where y_{ijst} is the log transaction amount sold by CR supplying firm i to MNE buyer j. α_{ij} are thus supplier-by-MNE buyer fixed effects. Given the bilateral nature of the transaction data, we also include

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[37]While we do not separately observe the number of hours worked per month, in these regressions we only focus on workers in full-time employment.

both supplier i's sector-by-year and MNE j's sector-by-year fixed effects. Here, the event-study terms are defined at the level of the MNE buyer j instead of that of its exposed suppliers, so that η indexes the number of years before or after the MNE j rolls out its RS policy.

The transaction-level version of the specification in equation (20) thus estimates the timeline of the effects of RS rollouts by MNEs j on the average transaction sales amount among their continuing suppliers. The identification strategy (and battery of specifications) is the same as discussed above.[38] In addition to the intensive margin, we also use the transaction database to estimate the effect on the total sales to RS-active MNEs (intensive plus extensive margins). To this end, we estimate the specification in equation (19) using PPML with total supplier sales to RS-active MNEs as the outcome.

4.2   Results

We first investigate the effect of RS on total supplier sales and employment.[39] Panels A and B of Figure 1 plot the respective point estimates for the IV specification. They correspond to column 4 in Panels A and B of Table 2. For each outcome in each panel, column 1 of Table 2 presents the two-way fixed effect specification with firm and sector-by-year fixed effects. Column 2 adds the flexible controls for having sold to any MNE at event period $\eta = -1$. Column 3 presents the same specification as in column 2 but is estimated using the method by Sun and Abraham (2020). Column 4 presents the same specification as in column 2, but after instrumenting for the treatment event dummies using only RS rollouts that were global in nature. Each specification (column) reports both the baseline event-study point estimates without pooling effects at $\eta \geq 4$ and the point estimate for $\eta \geq 4$ from a separate event-study regression (where we pool the longer-term effects keeping all else unchanged).

According to the IV specification, the total sales of exposed suppliers decrease by, on average, 6.5% 4 years after the first exposure to an RS rollout and by on average 9.8% when pooling 4 years or more after the event. This is accompanied by a fall in employment of 6.2% 4 years after and 8.6% after 4 years or more. For both outcomes, the two-way fixed effects, Sun-and-Abraham and IV specifications in columns 2-4 yield similar point estimates. This suggests that the heterogeneity in dynamic adjustments across treatment cohorts or the MNEs targeting the timing of RS to CR-specific shocks are unlikely confounders in our empirical setting. The concern of mechanical positive pre-trends and negative post-trends is apparent in column 1, where we do not control for having sold to any MNE at event year $\eta = -1$. After we include the event timeline for having sold to any MNE at $\eta = -1$, pre-trends disappear (see Figure 1 and Table 2 columns 2-4).[40]

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[38]Except that for outcomes at the MNE level we do not require additional controls for the potential mechanical bias (of having (lucky) sales to any MNE at year $\eta = -1$) that we address in the supplier-level event study.

[39]We measure employment as the total number of worker-months at the firm.

[40]The rest of the paper focuses on event-study figures, but we present the companion tables in Appendix B.

To further explore these effects, we also break up the average sales impact among exposed suppliers into different groups by supplier or MNE types. In Appendix Figure B1, we show that the negative impact on supplier sales is driven by firms in sectors that tend to be less regulated, namely sectors where small firms are more prevalent and services sectors. In Appendix Figure B2, we find that the effects are driven by RS events from MNEs headquartered in countries with more stringent labor regulations and higher average firm management scores.

We then investigate the effect of RS on workers using the specification in equation (20). Panels A and B of Figure 2 plot the event-study coefficients from the IV specification, while Appendix Table B5 presents the point estimates for all specifications (as in Table 2 above). Panel A of Figure 2 presents the results including all workers who have at some point during the sample worked at a supplier to an MNE. Panel B of Figure 2 breaks up the average effect on all workers into three different groups: workers in the bottom quarter of monthly earnings, in the top quarter of monthly earnings and the group in the middle between the two. To classify workers, we use their average monthly earnings in the first year that we observe each worker in the data (starting in 2006) to assign them to low, high or middle earnings groups.[41]

We find that workers' earnings increase on average post-RS rollout: by 1.5% 4 years after the rollout and 1.6% 4 years or more post-rollout. In Panel B of Figure 2, we interact the treatment timeline with the worker type dummies and find that the effect is concentrated among the initially low-wage workers, who see their monthly earnings increase by on average 4.3% 4 years after the rollout and by 4.8% 4 years or more post-rollout. We find an insignificant and close to zero point estimate of the effect on the initially high-salary workers and a weaker effect on workers for the middle group. In line with these effects, we find that the relative employment share of workers in the bottom quarter of initial earnings relative to workers in the top quarter of initial earnings significantly declines. Panel C of Figure 1 and Appendix Table B6 show these supplier-level event-study estimates. As before, the figure displays estimates from the IV specification (column 4 of Table B6), finding that the relative employment of initially low vs. high-wage workers decreases by about 8% 4 years after the rollout (similar for $\eta \geq 4$). Given the possibility of employing zero workers classified in the low-wage group, we add an additional column 5 in Table B6 where we use PPML estimation including the extensive margin. The reduction in relative employment increases to -14.3% 4 years after the rollout and -17.7% 4 years or more post-rollout.

We then use the transaction-level version of specification (20) to investigate the effect of RS on the intensive margin of sales to the RS-MNE. Panel A of Figure 3 plots the event-study coefficients from the IV specification (also shown in column 3 of Appendix Table B7). We find

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[41] If we observe a worker for the first time after 2006, we adjust their first-time monthly earnings for inflation using the annual consumer price index in CR.

that compliers' sales to the RS-MNE decline by on average 5.7% 4 years post-rollout and by 6.9% 4 years or more post-rollout. These regressions include buyer-by-seller as well as supplier and MNE sector-by-year fixed effects. In Panel B of Figure 3, we include the extensive margin as well. We estimate the effect on supplier sales to RS-active MNEs using PPML (also reported in Panel B, column 2 of Appendix Table B7). We find that the total sales to RS-active MNEs among exposed suppliers decrease by 27.2% 4 years or more post-rollout, suggesting that RS has both intensive and extensive-margin effects.[42] Panel C of Figure 3 and Panel C of Appendix Table B7 use the transaction data to estimate the effect of RS exposure on supplier sales to their other (non-RS) buyers. We find that the sales to non-RS buyers are also negatively affected among exposed suppliers. Four years after exposure those sales have decreased by 5.3% and they decreased by on average 8.8% 4 years or more post-rollout.

Finally, we study the effect of RS rollouts on the MNE itself. Appendix Figure B4 presents the MNE-level event study of the effect of RS on (i) the sales of the MNE subsidiary in CR (Panel A), and (ii) the share of the sales of the MNE subsidiary in CR in the global sales of the MNE (Panel B). As above, the graph plots the estimates from the IV specification, while Appendix Table B8 provides point estimates for all specifications. We find no discernible effect on either the total sales of the MNE subsidiary in CR or its sales relative to global group-level MNE sales. Moreover, we find no evidence of significant pre-trends at the MNE level.

Additional results   To provide additional context and assess potential alternative interpretations, we report additional results in Appendix B. Appendix Figure B3 presents suggestive evidence that exposed suppliers increased the length of maternity leave for women who took such leave (by on average 3 quarters of a month from a baseline of three months). Appendix Figure B6 explores whether part of the decline in exposed supplier sales and employment may be driven by suppliers splitting their production into separate firm entities. Such splitting may allow firms to apply the new requirements for workers to only those serving the RS-MNE. Using the matched employer-employee data, we test whether groups of workers from exposed suppliers are more likely to move jointly to new entities. We find no evidence of such worker relocation. In Appendix Figure B7, we investigate at whether RS rollout decisions by MNEs tend to be preceded or coincide with negative publicity campaigns or changes in MNE leadership positions. Using the Sigwatch, BoardEx and Orbis data described in Section 3, we find no evidence in support of either scenario, suggesting that RS policies are subject to longer-term considerations by the MNE.

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[42]Our model does not feature an entry margin to supplying the RS-MNE (among firms not already supplying). In Appendix Figure B5 we find no evidence for this margin.

5 Model quantification and counterfactual analysis

The empirical evidence presented above suggests that MNE rollouts of RS codes are, on average, not just "hot air". Instead, their effects on exposed suppliers and workers are qualitatively consistent with an increase in labor-related costs concentrated among initially low-wage workers. To rationalize these effects through the lens of the theory and quantify their welfare implications, we confront the comparative statics from the theory (Section 2.3) with the corresponding estimates from the event study (Section 4.2) to estimate the model's key parameters. We then proceed to the counterfactual analysis.

5.1 From evidence to model quantification

Model selection While the evidence in Section 4 is qualitatively consistent with the predictions of our baseline model, it does not support the alternative model with labor market monopsony power among CR suppliers. Table 1 summarizes the predictions of both models. Monopsony power held by CR suppliers would imply the opposite sign (+) of the estimated effects (-) of RS on compliers' sales, both to the RS-MNE and non-RS buyers. The intuition is that higher wages induce monopsonistic firms to move up the labor supply curve they face, increasing employment and sales of compliers.[43] Hence, we proceed to estimate the baseline model of Section 2.

Model estimation We need to quantify, first, the size and nature of the RS policy, namely, the size of the RS-induced cost increase $(\hat{\tau}_R^l)$, the size of any contemporaneous increase in labor productivity $\left(\hat{T}_R\right)$, the fraction of the cost increase that is passed through to the MNE (β) and the size of the RS-induced change in MNE output demand from MNE consumers $\left(\hat{d}_R\right)$. To complete the quantification of the model, we also need estimates of the elasticity of substitution that firms face in their output demand (σ), the shape parameter of the firm productivity distribution (θ) and the elasticity of substitution between worker types (ρ). Table 3 summarizes the moments used for the estimation of these parameters and their estimates that we now describe below. We also revisit this baseline calibration as part of the sensitivity analysis below.

First, we calibrate $\hat{T}_R$ using the estimate of the effect of RS on the monthly earnings of high-wage workers (defined as the top quarter as in the previous section), 4 years or more after RS rollout. This empirical counterpart of equation (10) yields an estimate close to zero (0.003) that is statistically insignificant (s.e. 0.004, see Panel B of Figure 2). Through the lens of the model, we do not find evidence of increases in broad based labor productivity at exposed suppliers, and calibrate $\hat{T}_R = 0$.

Second, we estimate the size of the RS cost shock $\hat{\tau}_R^l$. In principle, there are two natural approaches to this. We could directly use the measured effect of RS on low-wage (bottom quarter)

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[43]The absence of discernible monopsony power in our context seems consistent with the median size of 8 employees for exposed CR suppliers.

worker earnings (i.e., 4.8% at $\eta \geq 4$ in Panel B of Figure 2) and set $\hat{\tau}_R^l = 0.048 - \hat{T}_R = 0.048$ (using equation (9)). Alternatively, we could back out the size of the cost shock from the sales responses of suppliers. This second approach has advantages. As discussed in Section 3, requirements on labor earnings are only one of the many requirements imposed by RS codes. For instance, paid leave, health benefits, training or safety standards are not captured by labor earnings. It could also be that our estimates from the employer-employee microdata do not capture part of the cost imposed on RS suppliers, as they omit informal work arrangements. If firms have to formalize (previously unobserved) informal work relationships to comply with RS codes, this cost increase would not be reflected in our earnings regressions with worker-by-firm fixed effects. We could therefore be underestimating the true labor cost increase. The sales responses of exposed vs. non-exposed suppliers, on the other hand, capture such cost changes irrespective of whether they are directly observed in the earnings regressions. We follow this second approach and then compare the estimated size of the cost shock to the one reflected in worker earnings.

Specifically, the size of the RS cost shock $\chi_H^l \hat{\tau}_R^l$ is directly revealed by how much the sales to non-RS buyers of exposed suppliers decline following RS, conditional on a value of the elasticity of substitution σ (see model equation (14)). We take $\sigma = 5.03$ from Alfaro-Ureña et al. (2022), who estimate σ in a way consistent with our model and with the same firm-level CR microdata.[44] Combining this with the event-study estimate of equation (14) (-0.088 at $\eta \geq 4$, s.e. 0.027, see Panel C of Figure 3) and the average cost share of low-wage workers at suppliers in the data $\left(\chi_H^l = 0.19\right)$, we estimate that the average size of the cost shock on low-wage workers is $\hat{\tau}_R^l = 11.5\%$. Comparing this estimate to the estimate of the increase in monthly earnings of low-wage workers (4.8%) suggests that, indeed, not all the RS-induced labor cost increases at suppliers are reflected in worker earnings.[45]

The remaining parameters $\hat{d}_R$, β and θ must be estimated jointly using additional event-study moments that directly map into our theory (see Section 2.3). The estimate of the decline in compliers' sales to the RS-MNE in equation (13), compared to the decline in the sales to other (non-RS) buyers of exposed suppliers informs us on the extent of β and $\hat{d}_R$. In particular, the sales response to the RS-MNE (-0.069 at $\eta \geq 4$, s.e. 0.031, see Panel A of Figure 3) is less negative than the sales response to other (non-RS) buyers (-0.088), leaving room for the mitigating role of $\beta < 1$ and $\hat{d}_R > 1$ on suppliers' sales to the MNE. We need another moment to disentangle β and $\hat{d}_R$. We use the effect of RS on the sales of the MNE subsidiary itself in equation (17) (-0.017, with s.e. 0.098, see Panel A of Figure B4).[46] Finally, comparing the total sales response of exposed firms in

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[44]Their estimate is also in the mid-range of existing estimates in the literature (for a review, see Hottman et al., 2016).

[45]For instance, in Appendix Figure B3 we provide evidence of an increase in the length of maternity leave.

[46]Based on our model, several forces attenuate the effect on the MNE: (i) MNE subsidiaries are only affected by costs of RS in proportion to their cost share spent on CR suppliers ($\Xi = 0.14$); (ii) cost increases at suppliers may not be fully

equation (16) (-0.098 at $\eta \geq 4$, s.e. 0.022, see Panel A of Figure 1) to the intensive margin effects is informative about the extensive margin response governed by θ. Formally, to estimate $\left(\hat{d}_R, \beta, \theta\right)$, we invert this system of three equations on supplier and MNE sales in the three unknowns.[47]

We find that the cost pass-through is not complete, but also not extremely low ($\beta = 0.8$). We find little evidence of a discernible positive demand shift for the MNE output ($\hat{d}_R = 0.001$). Intuitively, given the relatively small cost shock that RS policies represent for the MNE (see footnote 46), one can rationalize the small negative point estimate on the MNE subsidiary sales (-1.7%) without much of a positive shift in MNE output demand. Finally, we estimate a shape parameter of the domestic productivity distribution of $\theta = 6.21$, which lies in the mid-range of existing estimates in trade and macroeconomics (e.g., Melitz and Redding, 2014).

Finally, to estimate ρ, the elasticity of substitution between high and low-wage workers, we use the relative employment response (equation (11)). The event-study estimate is -0.177 (s.e. 0.056, see column 5 of Table B6).[48] Given the estimate of $\hat{\tau}_R^l$, this yields $\rho = 1.54$, which is close to existing recent estimates (e.g., Diamond, 2016, Burstein and Vogel, 2017, Piyapromdee, 2021).

5.2 Counterfactual analysis

Armed with the quantified model, we proceed to investigate the welfare implications of RS policies. We consider a counterfactual that compares an equilibrium without RS to one corresponding to the extent of RS rollouts that we observe in CR at the end of the sample in 2019.

Additional moments   Appendix A.3 lays out the system of equations of the counterfactual analysis in the full model. Quantifying this system requires calibrating additional data moments directly from the microdata in 2019. First, we compute the share of total production by domestic (non-MNE) firms in CR that is produced by suppliers to RS-active MNE subsidiaries by the end of our sample. As discussed in Section 3, this share is 38% in the data. Second, we compute the share of total sales of MNE subsidiaries in CR made by MNEs with RS policies active in 2019 to be 47% in the data. Third, we compute the share of CR exports made by firms who are also selling to MNE subsidiaries (regardless of RS status) in CR to be 62%.[49]

Welfare impact of RS in CR   Figure 4 presents the welfare incidence of RS in CR, in the aggregate as well as across different groups of workers. Our first finding is that RS in CR has had positive but minor aggregate implications on welfare, both for initially low-wage and high-wage workers

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passed through to the MNE ($\beta < 1$); and (iii) the MNE might experience demand increases due to RS ($\hat{d}$).

[47]We also require the calibration of the average sales share to the RS-MNE by exposed firms before RS that we measure in the transaction data ($\xi = 0.25$).

[48]In our baseline, we use the PPML specification to allow for movements in or out of zero employment of low-wage workers. Below, we also report counterfactual results across alternative values of ρ, including the lower point estimate in the IV log specification of Panel C in Figure 1 and column 4 of Table B6.

[49]While our model does not distinguish between traded and non-traded sectors, we measure this export share directly from the data, including service providers to MNEs (with zero exports), and thus not over-counting the export share of MNE suppliers.

(+0.2%). The welfare expression in equation (18) provides intuition as to why this is the case in our context. First, we find no evidence of RS-induced productivity gains or discernible positive demand shocks associated with RS, so that the two last (positive) terms of the welfare expression drop out. To understand the welfare effect of RS in our empirical context, we can therefore focus on the first term, i.e., the export tax effect. Importantly, this *a priori* positive effect is mitigated by the extent of cost pass-through from suppliers to prices paid by the MNE (β) and any leakage of RS to the domestic market (Λ). If pass-through was complete ($\beta = 1$) and all of the RS-affected production was destined for exports ($\Lambda = 0$), then the representative worker in CR would benefit to the full extent from the RS-induced improvement in the terms of trade. In our context, however, we find that the pass-through is incomplete ($\beta = 0.80$) and the degree of leakage is $\Lambda = 0.38$.[50] According to (18), these findings imply that the gains from the RS export tax remain positive (since $\beta > \Lambda$), but are reduced by more than half.

In addition, the terms of trade effect is constrained by the fact that the average cost share of the affected low-wage workers in suppliers' production is $\chi^l = 0.19$, and that these workers experienced an estimated $\hat{\tau}_R^l = 0.115$ increase in their labor cost. These estimates imply a relatively small aggregate export-tax equivalent (of roughly 2.2%), even if all exports were affected by RS—as we assume in the simplified setup for (18) but not in the full model used for the counterfactual analysis here.

These aggregate effects, however, mask significant heterogeneity within worker types. 29% of all CR low-wage workers are "exposed" to RS in our counterfactual, i.e., in the initial equilibrium, they are employed at suppliers that are selling inputs (prior to RS) to the 47% of MNE production that ends up rolling out RS in the counterfactual. We find that these exposed low-wage workers, as a group, experience large welfare gains (+8.1%), while the remaining majority of low-wage workers in CR, who are employed at non-exposed firms *ex ante*, experience significant real income losses (-3.1%) due to adverse GE effects on their wages and the leakage into the domestic price index.

Additional counterfactual results   We also quantify these counterfactuals across a number of alternative model assumptions and parameter values. These additional results serve both to assess the sensitivity of our findings in the current setting of CR, and to document how the impacts of RS may differ across other empirical settings.

First, the counterfactual analysis above isolates the welfare impact of RS policies targeted at MNE suppliers, assuming that in the initial equilibrium, MNEs had already implemented similar policies for their own workers. Alternatively, as discussed in Section 2, we can study the welfare effects of RS policies that are implemented *at the same time* at MNE subsidiaries and their

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[50]In the simplified setup of (18), Λ is equal to the share of domestic firm (non-MNE) production not sold to MNEs that is subject to RS (36% in 2019). In the full model we quantify, suppliers are allowed to export directly. The share of RS-affected sales by domestic firms that is sold domestically (not exported or to MNEs) is 38% in the data in 2019.

suppliers. The fraction of exposed low-wage workers increases to 40% in this scenario (from 29% above). As the red bars in Figure 4 show, the welfare gains of these exposed low-wage workers slightly decrease to 6.9%, while the losses of the remaining 60% of non-exposed low-wage workers rise to -4.5% due to more pronounced GE effects on their wages and the price index.

Second, our baseline model assumes that labor supply is inelastic (leading to full employment). We extend the model to feature an elastic aggregate labor supply and unemployment. We summarize this extension here and provide a detailed exposition in Appendix A.6.1. Workers make a discrete choice of working (with indirect utility as in the baseline) or being unemployed (with utility u_0). This generates an upward-sloping aggregate labor supply with elasticity κ and endogenous unemployment. We then show that the welfare impact of RS on the average worker is:

$$\hat{U}_H = \left(1 - \Lambda^U\right) \big\{ \underbrace{\left(\beta - \Lambda\right) W^{tax} \chi_H^l \hat{\tau}_R^l \; + \; \left(\lambda_{FH} + \Lambda \lambda_{HH}\right) W^{prod} \hat{T}_R \; + \; W^d \hat{d}_R}_{\text{Welfare effect of RS in the baseline}} \big\},$$

where λ^U is the initial share of unemployment in the labor force before RS and $1 - \Lambda^U \equiv \left(1 - \lambda^U\right) / \left(1 + \frac{\lambda_{FH} \kappa \lambda^U}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma - 1)}\right)$. Relative to the case without unemployment (in equation (18)), the potential gains (or losses) from RS are muted in an economy with unemployment. In particular, the attenuation factor of unemployment $\left(1 - \Lambda^U\right)$ decreases toward zero when unemployment in the initial (pre-RS) equilibrium increases. Using the fact that the unemployment rate in CR at the beginning of our sample was roughly 7%, we plot in Appendix Figure B8 this attenuation factor across a wide range of labor supply elasticities (κ). Overall, the welfare effect of RS is only very slightly attenuated by the presence of unemployment in our empirical setting, even when considering highly elastic labor supply $\left(1 - \Lambda^U > 0.92\right)$.

Third, in the baseline we assume that the labor cost increase is fully paid to the low-wage workers (through nominal earnings, benefits, sick leave, or other amenities). Relaxing this assumption, we consider the case where some of the increase in labor costs is a pure waste (or not captured by domestic agents). Appendix Figure B9 plots the welfare change for low-wage workers as a function of the fraction of $\hat{\tau}_R^l$ captured directly by low-wage workers. Following intuition, the estimated gains to RS-exposed low-wage workers fall in proportion to the assumed share of $\hat{\tau}_R^l$ captured by workers.

Finally, Appendix Figures B10-B17 present the counterfactual welfare incidence in the aggregate and by worker type for alternative parameter values of σ, θ, β, ρ, $\hat{d}_R$ γ, $\hat{\tau}_R^l$ and $\hat{T}_R$. In each figure, the red dots indicate the parameter values from our preferred calibration using the CR database. The welfare implications are intuitive through the lens of our theory. These additional counterfactuals illustrate how the implications of RS are likely to change across different empirical settings.

6 Conclusion

To study the welfare implications of RS requirements in sourcing countries, we develop a theory that nests alternative hypotheses about the environment in which RS is being implemented. We then build a unique database in the context of CR to provide new evidence of the impact of RS on exposed firms and workers, and confront this evidence with the comparative statics from our model. This combination of theory and data allows us to conduct counterfactual analyses of the aggregate and distributional implications of RS in CR.

In the theory, we show that the welfare effect of RS in sourcing countries is *a priori* ambiguous. RS can lead to adverse consequences in environments where the cost pass-through to MNE buyers is incomplete and where affected suppliers also produce a significant share of output for domestic consumers. Underlying this, we document the interplay between a positive effect of RS that is akin to the one of an export tax and a negative effect due to a labor market distortion that can "leak" into the domestic price index. Additional gains arise to the extent that RS is on average accompanied by direct productivity effects on suppliers or positive shifts in demand for the MNE's output due to announcing and implementing RS.

Empirically, we find that RS is on average not just "hot air": the sales and employment of exposed suppliers decline, while the labor earnings of initially low-wage workers increase. This evidence is consistent with RS policies raising labor-related production costs, particularly for workers at the bottom of the initial earnings distribution. On its own, however, this reduced-form evidence would be insufficient to evaluate the welfare implications of RS. Combining our model with the data, we estimate that the average effective cost increase of RS among low-wage workers is about 12%, the fraction of domestic expenditure affected is 38% (leakage) and the cost pass-through to MNEs is incomplete. We do not find compelling evidence that RS rollouts directly improve worker productivity or lead to discernible changes in output demand for the MNE. On net, RS has led to positive but minor aggregate welfare changes in CR. These aggregate implications, however, mask significant heterogeneity: low-wage workers at exposed suppliers experience sizable welfare gains, whereas the majority of low-wage workers experience welfare losses due to adverse equilibrium effects on their wages and the domestic price index.

As our theory highlights, the welfare implications of RS on workers can vary across different contexts. This calls for some caution when extrapolating findings to different settings, and for an exciting agenda for future research on this increasingly widespread global practice.

References

Alfaro-Ureña, A., Manelici, I., and Vasquez, J. P. (2021). The Effects of Multinationals on Workers: Evidence from Costa Rican Microdata. *Working Paper*.

Alfaro-Ureña, A., Manelici, I., and Vasquez, J. P. (2022). The Effects of Joining Multinational Supply Chains: New Evidence from Firm-to-Firm Linkages. *Quarterly Journal of Economics*, 137(3):1495–1552.

Amengual, M. and Distelhorst, G. (2020). Cooperation and Punishment in Regulating Labor Standards: Evidence from the Gap Inc Supply Chain. *SSRN Working Paper*.

Bénabou, R. and Tirole, J. (2010). Individual and Corporate Social Responsibility. *Economica*, 77(305):1–19.

Berger, D. W., Herkenhoff, K. F., and Mongey, S. (2022). Minimum Wages, Efficiency and Welfare. *NBER Working Paper 29662*.

Besley, T. and Ghatak, M. (2007). Retailing Public Goods: The Economics of Corporate Social Responsibility. *Journal of Public Economics*, 91(9):1645–1663.

Borusyak, K., Spiess, J., and Jaravel, X. (2021). Revisiting Event Study Designs: Robust and Efficient Estimation. *UCL Working Paper*.

Bossavie, L., Cho, Y., and Heath, R. (2020). The Effects of International Scrutiny on Manufacturing Workers: Evidence from the Rana Plaza Collapse in Bangladesh. *World Bank Policy Research Working Paper 9065*.

Boudreau, L. (2021). Multinational Enforcement of Labor Law: Experimental Evidence from Bangladesh's Apparel Sector. *Working Paper*.

Burstein, A. and Vogel, J. (2017). International Trade, Technology, and the Skill Premium. *Journal of Political Economy*, 125(5):1356–1412.

Caliendo, L. and Parro, F. (2021). Trade Policy. In *Handbook of International Economics*, volume 5. Elsevier.

Callaway, B. and Sant'Anna, P. H. (2020). Difference-in-Differences with Multiple Time Periods. *Journal of Econometrics*.

Campbell, J. L. (2007). Why Would Corporations Behave in Socially Responsible Ways? An Institutional Theory of Corporate Social Responsibility. *Academy of Management Review*, 32(3):946–967.

Cengiz, D., Dube, A., Lindner, A., and Zipperer, B. (2019). The Effect of Minimum Wages on Low-Wage Jobs. *Quarterly Journal of Economics*, 134(3):1405–1454.

De Chaisemartin, C. and d'Haultfoeuille, X. (2020). Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *American Economic Review*, 110(9):2964–96.

De Janvry, A., McIntosh, C., and Sadoulet, E. (2015). Fair Trade and Free Entry: Can a Disequilibrium Market Serve as a Development Tool? *Review of Economics and Statistics*, 97(3):567–573.

Diamond, R. (2016). The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000. *American Economic Review*, 106(3):479–524.

Dragusanu, R., Montero, E., and Nunn, N. (2022). The Effects of Fair Trade Certification: Evidence from Coffee Producers in Costa Rica. *Journal of the European Economic Association*, 20(4):1743–1790.

Dube, A. (2019). Impacts of Minimum Wages: Review of the International Evidence. *Independent Report. UK Government Publication*, pages 268–304.

Eichholtz, P., Kok, N., and Quigley, J. M. (2010). Doing Well by Doing Good? Green Office Buildings. *American Economic Review*, 100(5):2492–2509.

Faber, B., Krause, B., and Sánchez de la Sierra, R. (2017). Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo. *CEGA Working Paper, UC Berkeley*.

Fioretti, M. (2020). Social Responsibility and Firm's Objectives. *Sciences Po Working Paper*.

Gindling, T. H., Mossaad, N., and Trejos, J. D. (2015). The Consequences of Increased Enforcement of Legal Minimum Wages in a Developing Country: An Evaluation of the Impact of the Campaña Nacional de Salarios Mínimos in Costa Rica. *ILR Review*, 68(3):666–707.

Goodman-Bacon, A. (2021). Difference-in-Differences with Variation in Treatment Timing. *Journal of Econometrics*, 225(2):254–277.

Harrison, A. and Rodríguez-Clare, A. (2010). Trade, Foreign Investment, and Industrial Policy for Developing Countries. *Handbook of Development Economics*, 5:4039–4214.

Harrison, A. and Scorse, J. (2010). Multinationals and Anti-Sweatshop Activism. *American Economic Review*, 100(1):247–73.

Harrison, A., Scorse, J., Collins, S., and Elliott, K. A. (2003). Globalization's Impact on Compliance with Labor Standards [with comments and discussion]. In *Brookings Trade Forum*, pages 45–96. JSTOR.

Hart, O. and Zingales, L. (2017). Companies Should Maximize Shareholder Welfare Not Market Value. *ECGI-Finance Working Paper*, –(521).

Hatte, S. and Koenig, P. (2020). The Geography of NGO Activism Against Multinational Corporations. *World Bank Economic Review*, 34(1):143–163.

Herkenhoff, P. and Krautheim, S. (2022). The International Organization of Production in the Regulatory Void. *Journal of International Economics*, 137:103572.

Hjort, J., Li, X., and Sarsons, H. (2020). Across-Country Wage Compression in Multinationals. *NBER Working Paper 26788*.

Hottman, C. J., Redding, S. J., and Weinstein, D. E. (2016). Quantifying the Sources of Firm Heterogeneity. *Quarterly Journal of Economics*, 131(3):1291–1364.

ILO (2016). Decent Work in Supply Chains. *Report IV*.

Javorcik, B. (2004). Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages. *American Economic Review*, 94(3):605–627.

Koenig, P., Krautheim, S., Löhnert, C., and Verdier, T. (2021). Local Global Watchdogs: Trade, Sourcing and the Internationalization of Social Activism. *CESifo Working Paper 9068*.

La Nación (2009). One of Three Workers Earns Less than the Minimum Wage. *La Nación, December 2009*.

Macchiavello, R. and Miquel-Florensa, J. (2019). Buyer-Driven Upgrading in GVCs: The Sustainable Quality Program in Colombia. *CEPR Discussion Paper No. DP13935*.

McLaren, J. and Im, H. (2021). Foreign Direct Investment, Global Value Chains, and Labor Rights: No Race-to-the-Bottom? *Working paper*.

Melitz, M. J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6):1695–1725.

Melitz, M. J. and Redding, S. J. (2014). Heterogeneous Firms and Trade. *Handbook of International Economics*, 4:1–54.

Méndez-Chacón, E. and Van Patten, D. (2021). Multinationals, Monopsony and Local Development: Evidence from the United Fruit Company. *Working Paper*.

OECD (2016). OECD Economic Surveys: Costa Rica 2016 – Economic Assessment. *Report*.

OECD (2017). OECD Reviews of Labour Market and Social Policies: Costa Rica. *Report*.

Piyapromdee, S. (2021). The Impact of Immigration on Wages, Internal Migration, and Welfare. *Review of Economic Studies*, 88(1):406–453.

Podhorsky, A. (2013). Certification Programs and North-South Trade. *Journal of Public Economics*, 108:90–104.

Podhorsky, A. (2015). A Positive Analysis of Fairtrade Certification. *Journal of Development Economics*, 116:169–185.

Roth, J. and Sant'Anna, P. H. (2021). Efficient Estimation for Staggered Rollout Designs. *arXiv preprint arXiv:2102.01291*.

Sun, L. and Abraham, S. (2020). Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects. *Journal of Econometrics*.

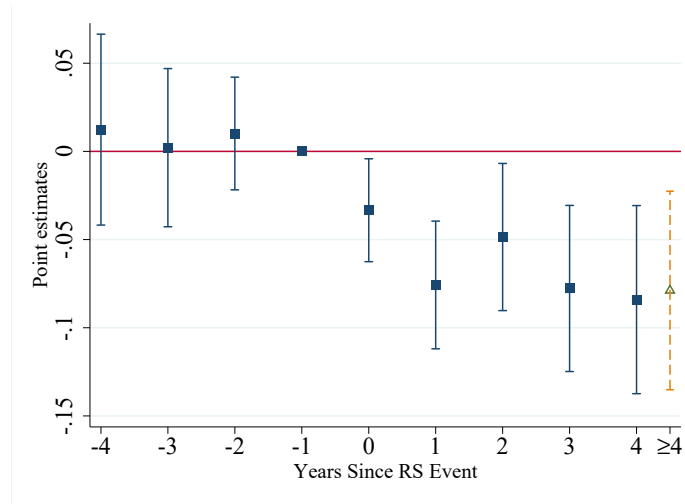Verhoogen, E. (2016). How Labor Standards Can Be Good for Growth. *Harvard Business Review*.

Figures

Figure 1: Supplier-Level Effects of Exposure to MNE RS Rollouts
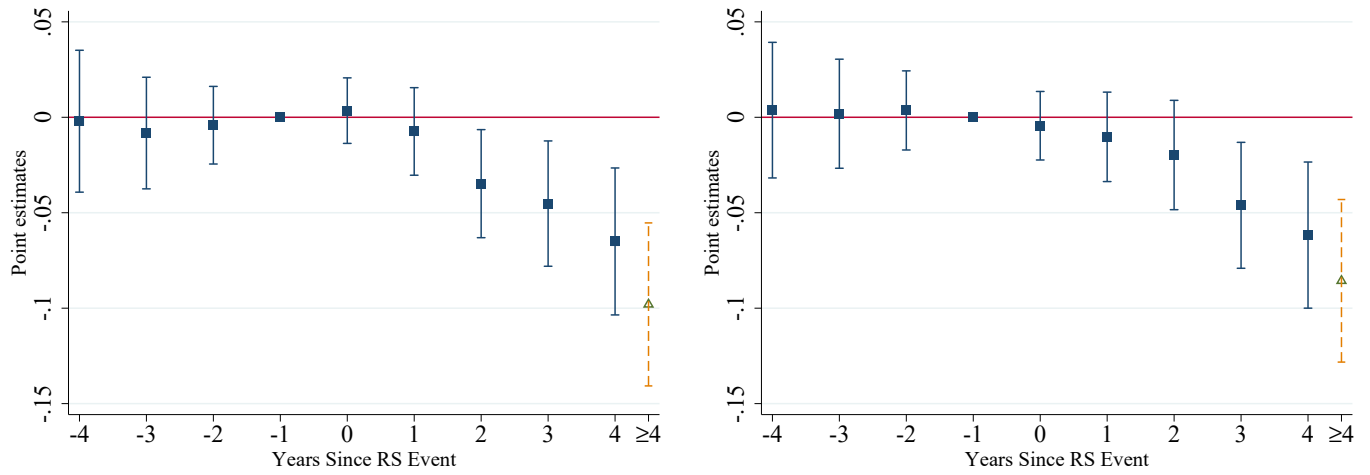
(A) Supplier Annual Total Sales

(B) Supplier Employment

(C) Employment Ratio of Low- vs. High-Wage Workers

Notes: Figure plots estimates from the firm-level event-study specification (19). Panels A, B and C plot estimates from the IV specification in column 4 from Panels A, B of Table 2 and from Appendix Table B6, respectively. The outcome in Panel A is the log of total annual firm sales. The outcome in Panel B is the log of total annual worker-months (number of months worked summed across all workers) at the supplier. The outcome in Panel C is the log employment ratio of the top and bottom quarter of workers in terms of initial monthly earnings. 95% confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure 2: Worker-Level Effects of Exposure to MNE RS Rollouts on Labor Earnings

(A) All Workers

(B) Heterogeneity by Initial Worker Earnings
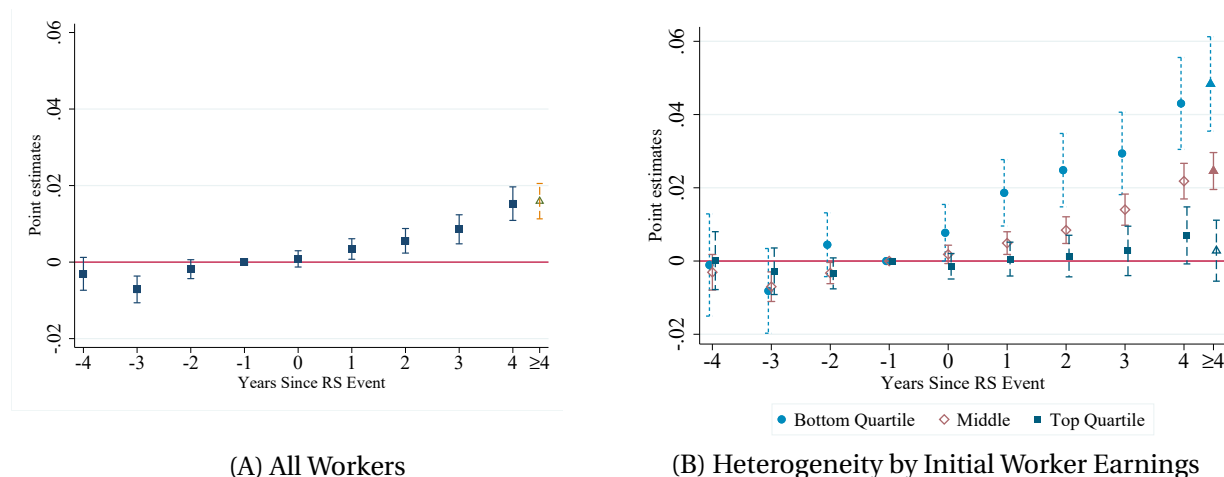
Notes: Figure plots estimates from the worker-level event-study specification (20). Estimates in Panels A and B correspond to column 4 of Panels A and B in Appendix Table B5, respectively. The outcome is the log of worker annual earnings divided by the number of months of employment, restricted to worker-months with full-time employment. In Panel B, we implement a heterogeneity analysis based on the quartile of a worker's initial earnings. We group workers based on their quartile in the distribution of (inflation-adjusted) monthly earnings in the first year we observe each worker since 2006. 95% confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure 3: Transaction-Level Effects of MNE RS Rollouts
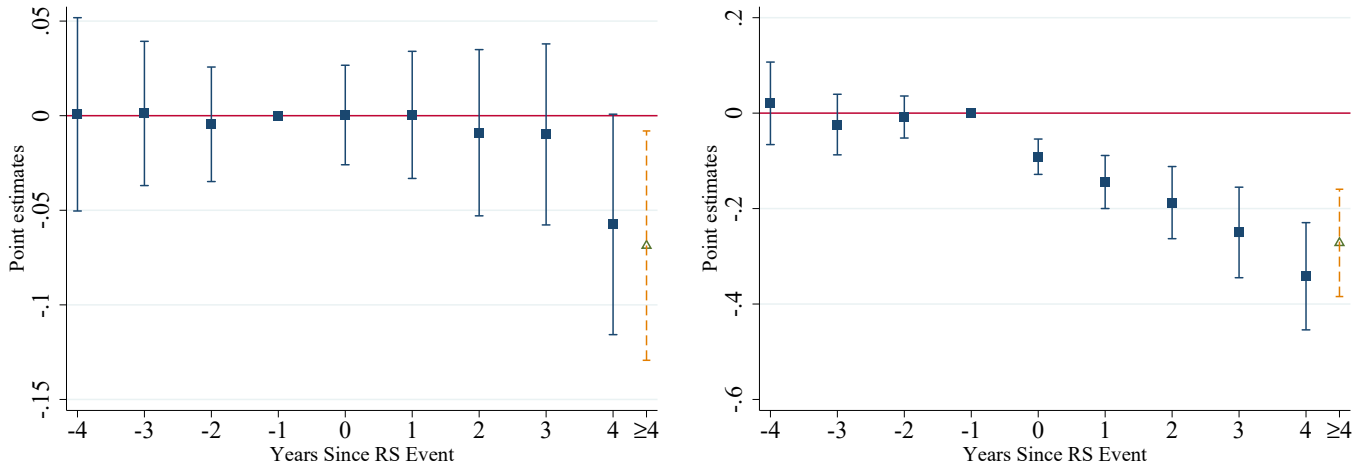
(A) Intensive Margin among Complying Suppliers

(B) Total Sales to RS-Active MNEs (Int. + Ext. Margin)
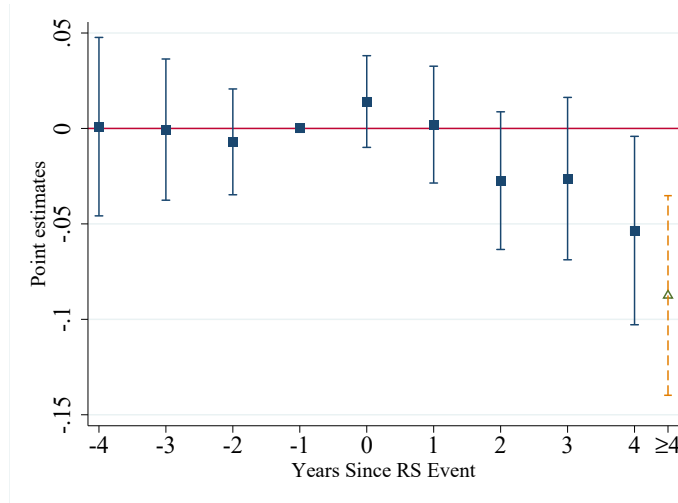
(C) Supplier Sales to Other (Non-RS) Buyers

Notes: Panel A plots estimates from the transaction-level event-study (20), using the IV specification in column 3 of Panel A in Appendix Table B7. The outcome are log sales for transactions between MNE buyers and domestic suppliers. Panel B presents the estimates of a PPML estimation with the total sales to RS-active MNEs as the outcome from column 2 in Panel B of Appendix Table B7. The outcome in Panel C is the log sales to other (non-RS) buyers from column 3 of Panel C of Appendix Table B7. 95% confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure 4: Welfare Incidence of RS in CR
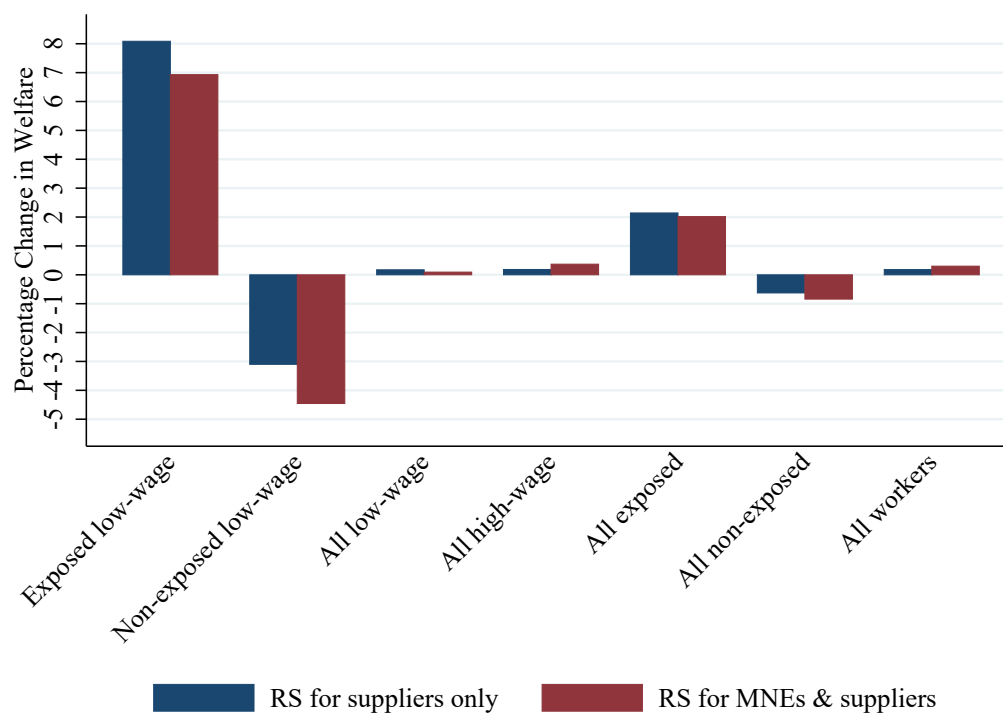
Notes: Figure plots welfare effects from the counterfactual analysis of RS in Costa Rica as of 2019, in the aggregate and across six groups of workers. Navy bars correspond to the baseline scenario where RS only affects suppliers (and was already in place at MNE subsidiaries). Red bars correspond to the scenario where MNEs simultaneously roll out RS in-house and on suppliers. See Section 5.2 for discussion.

Tables

Table 1: Summary of Comparative Statics

Comparative statics:	Baseline (all variants)	Labor monopsony	Model equation
Compliers			
Sales to RS-MNE	-/+	+	(13)
Exposed firms			
Sales to non-RS buyers	-	+	(14)
Sales to RS-MNE	-/+	-/+	(15)
Total sales	-/+	-/+	(16)

Notes: Table provides a qualitative summary of the model's comparative statics from Section 2.3.

Table 2: Supplier-Level Effects of Exposure to MNE RS Rollouts on Sales and Employment

	Panel A: Log Supplier Sales				Panel B: Log Supplier Employment			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	TWFE	TWFE	SA	IV	TWFE	TWFE	SA	IV
$\eta = -4$	-0.130***	-0.004	0.031*	-0.002	-0.089***	-0.005	0.022	0.004
	(0.018)	(0.018)	(0.018)	(0.019)	(0.017)	(0.017)	(0.017)	(0.018)
$\eta = -3$	-0.091***	-0.014	0.017	-0.008	-0.046***	-0.000	0.023*	0.002
	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)	(0.013)	(0.014)	(0.015)
$\eta = -2$	-0.051***	-0.008	0.011	-0.004	-0.019*	0.003	0.019**	0.004
	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)
$\eta = -1$	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
$\eta = 0$	0.016*	0.004	-0.003	0.003	0.012	-0.003	-0.008	-0.004
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.009)
$\eta = 1$	-0.003	-0.001	-0.012	-0.007	0.019*	-0.001	-0.008	-0.010
	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)
$\eta = 2$	-0.044***	-0.025*	-0.035***	-0.035**	0.009	-0.010	-0.015	-0.020
	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)	(0.015)
$\eta = 3$	-0.067***	-0.036**	-0.048***	-0.045***	-0.005	-0.028*	-0.035**	-0.046***
	(0.015)	(0.015)	(0.015)	(0.017)	(0.015)	(0.015)	(0.016)	(0.017)
$\eta = 4$	-0.113***	-0.052***	-0.064***	-0.065***	-0.027	-0.044**	-0.052***	-0.062***
	(0.018)	(0.018)	(0.018)	(0.020)	(0.017)	(0.018)	(0.018)	(0.020)
$\eta \geq 4$	-0.177***	-0.080***	-0.129***	-0.098***	-0.066***	-0.069***	-0.111***	-0.086***
	(0.019)	(0.019)	(0.021)	(0.022)	(0.018)	(0.019)	(0.021)	(0.022)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Sect FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adjusted R^2	0.81	0.82	0.83	–	0.80	0.81	0.81	–
# Observations	173636	173636	173636	173636	163845	163845	163845	163845
# Firms	20770	20770	20770	20770	20271	20271	20271	20271
# Sector-Year Bins	2923	2923	2923	2923	2915	2915	2915	2915

Notes: Table presents two-way fixed effects (TWFE), Sun and Abraham (2020) (SA) and IV estimates for the firm-level specification in equation (19). Outcomes are suppliers' log annual sales in Panel A and log annual worker-months of employment in Panel B. Columns 4 in both panels correspond to panels A and B of Figure 1. The first-stage F-statistic for the IV columns exceed 50 in all cases. Standard errors clustered at the firm level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Section 4 for discussion.

Table 3: Parameter Estimates and Moments Used in Estimation

Parameter:	σ	$\hat{T}_R$	$\hat{\tau}_R^l$	β	θ	$\hat{d}_R$	ρ
Our estimate	5.03	0	0.115	0.795	6.21	0.001	1.54
Moments used	Alfaro-Ureña	Panel B	Panel C		Panel A		Column 5
in estimation	et. al (2022)	Figure 2	Figure 3	Figures 1, 3 and B4			Table B6

Notes: Table summarizes the model's parameter estimates alongside the empirical moments used in their estimation. The estimate of σ is taken from prior work using the same data. See Section 5.1 for discussion.

Responsible Sourcing?
Theory and Evidence from Costa Rica

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Appendix for online publication

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Appendix A provides derivations and additional details for the model presented in Section 2. Appendix B provides additional figures and tables referenced in the main text.

Appendix A   Theory appendix

Appendix A.1   Model equilibrium

We lay out here the main equilibrium equations for the model. We detail first firm-level outcomes given general equilibrium (GE) quantities, then the complete GE solution of the model.

Notations   Let $y_{ij,r}^t$ denote outcome y of an entity with RS status r and for workers of type t. When $i = H$, then $y_{ij,r}^t$ refers to a Home firm producing for the destination market $j = H, F, M$ (respectively: Home, exports to Foreign, or production of inputs for MNE subsidiaries).[i] When $i = M$, then $y_{M,r}^t$ refers to the production of MNE subsidiaries at Home. Market-level aggregates are denoted with capital letters. Finally, $y_{ij,r}$ without superscript t sums outcomes across worker types ($y_{ij,r} = \sum_{t=l,h} y_{ij,r}^t$) and $y_{i,r}^t$ without j subscript sums outcomes across all the production lines of a firm ($y_{i,r}^t = \sum_{j=H,F,M} y_{ij,r}^t$). Similarly, Y_{ij}^t without subscript r sums outcomes across firms of all status ($Y_{ij}^t = \sum_{r=R,N} Y_{ij,r}^t$).

Appendix A.1.1   Firm-level outcomes

Labor use   Given the labor aggregator in equation (1), a firm or an MNE subsidiary facing wages $\{w_{i,r}^t\}$ chooses relative employment of low- and high-wage workers as follows:

$$\chi_{i,r}^t = \frac{w_{i,r}^t \ell_{i,r}^t}{W_{i,r}\ell_{i,r}} = \frac{\alpha_i^t \left(w_{i,r}^t\right)^{1-\rho}}{W_{i,r}^{1-\rho}}, \tag{A1}$$

where $\ell_{i,r}$ is the labor aggregate in equation (1) and $W_{i,r}$ is the corresponding labor cost index of the firm:

$$W_{i,r} = \left[\left(\alpha_i^l\right)^\rho \left(w_{i,r}^l\right)^{1-\rho} + \left(\alpha_i^h\right)^\rho \left(w_{i,r}^h\right)^{1-\rho}\right]^{\frac{1}{1-\rho}}, \text{ for } i = H, M, F. \tag{A2}$$

In the baseline equilibrium without RS, we simply denote χ_H^t (χ_M^t, respectively) the share of $t-$workers in the wage bill of Home firms (MNE subsidiaries, respectively).

Non-MNE firms   All firms with the same productivity make the same choices such that firm-level expressions are given as a function of their productivity z. Denoting $\mu_{ij,r}$ the markup of firms of type r on market $j = H, F, M$, output prices are given by:

$$p_{ij,r} = \mu_{ij,r}\frac{\varrho_{ij} W_{H,r}}{z},$$

where $\varrho_{ij} = \varrho$ if $ij = HF, FH$ and $\varrho_{ij} = 1$ otherwise. In a baseline without RS, firms are monopolistically competitive on all markets so that

$$\mu_{ij,r} = \frac{\sigma}{\sigma - 1}. \tag{A3}$$

When RS is implemented, we allow for the markups to adjust so that only a share β of the suppliers' cost increase is passed through to the input price paid by the MNE (on other markets, the pass-through is complete). We define

$$\beta = \frac{\partial \log p_{HM,R}}{\partial \chi_H^l \log \tau_R^l}, \tag{A4}$$

where $\chi_H^l \log \tau_R^l$ measures the size of the RS cost shock as described in the next section. Given CES demand and firms' linear production costs, firm sales $y_{ij,r}$, employment $\ell_{ij,r}^t$, and profits $\pi_{ij,r}$ (conditional on

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[i]Notations are symmetric for Foreign, with fewer combinations of subscripts since, e.g., Foreign firms do not produce intermediates.

choosing to produce) are, respectively:

$$y_{ij,r} = \mu_{ij,r}^{1-\sigma} z^{\sigma-1} \varrho_{ij}^{1-\sigma} W_{i,r}^{1-\sigma} D_{j,r}, \tag{A5}$$

$$\ell_{ij,r}^{t} = \left(\alpha^{t}\right)^{\rho} \left(\mu_{ij,r}\right)^{-\sigma} z^{\sigma-1} \varrho_{ij}^{1-\sigma} \left(w_{i,r}^{t}\right)^{-\rho} W_{i,r}^{\rho-\sigma} D_{j,r} + f_{ij} \left(\alpha^{t}\right)^{\rho} \left(\frac{w_{i,r}^{t}}{W_{i,r}}\right)^{-\rho}, \quad t = l, h \tag{A6}$$

$$\pi_{ij,r} = \mu_{ij,r}^{-\sigma} \left(\mu_{ij,r} - 1\right) z^{\sigma-1} \varrho_{ij}^{1-\sigma} W_{i,r}^{1-\sigma} D_{j,r} - W_{i,r} f_{ij}, \tag{A7}$$

where $D_{j,r}$ corresponds to the aggregate demand shifter on market j for firms with status $r = R, N$:

$$D_{i,r} = P_i^{\sigma-1} X_i \quad \text{for } i = H, F, \tag{A8}$$

$$D_{M,r} = R_r^{\sigma} M_r. \tag{A9}$$

In these expressions, we have used X_i to denote total expenditure in country $i = H, F$ and P_i to denote the ideal price index for consumption in i which is, given the demand in equation (2):

$$P_i = \left(\int_{\Omega_i} p_w^{1-\sigma} \, d\omega\right)^{\frac{1}{1-\sigma}}. \tag{A10}$$

On the market for intermediate inputs sold to MNEs, R_r is the input cost index for an MNE subsidiary with RS policy r, which is, given the production function in equation (5):

$$R_r = \left(\int_{\Omega_x} p_{HM,r} \left(\omega_x\right)^{1-\sigma} \, d\omega_x + \xi^{\sigma} W_{M,r}^{1-\sigma}\right)^{\frac{1}{1-\sigma}}, \tag{A11}$$

and M_r is subsidiary output given in equation (5).

Profits on each market destination market $j = H, M, F$ are increasing in productivity, so that only firms above a given productivity cutoff enter the market. Given the expression for profits in equation (A7), the selection cutoff corresponding to zero profit on market j for firms with RS status r is:

$$z_{ij,r}^{*} = \left(\frac{1}{(\mu_{ij,r} - 1)\mu_{ij,r}^{-\sigma}}\right)^{\frac{1}{\sigma-1}} \frac{f_{ij}^{\frac{1}{\sigma-1}} \varrho_{ij} W_{i,r}^{\frac{\sigma}{\sigma-1}}}{D_{j,r}^{\frac{1}{\sigma-1}}}. \tag{A12}$$

The total sales of firms on destination market $j = H, M, F$ are then given by $Y_{ij,r} = \int_{z_{ij,r}^{*}}^{\infty} y_{ij,r}(z) \, dG_i(z)$, or, given the assumption that productivity is Pareto distributed:

$$Y_{ij,r} = \left(\frac{\theta}{\theta - \sigma + 1}\right) \left(\mu_{ij,r} \varrho_{ij} W_{i,r}\right)^{1-\sigma} D_{j,r} \left(z_{ij,r}^{*}\right)^{\sigma-1-\theta}. \tag{A13}$$

MNE headquarters and subsidiary   We turn to describing the choices of the MNE headquarters and subsidiary. We have already defined above the cost index R_r of an MNE subsidiary with RS status r (see equation (A11)). The MNE headquarters in Foreign imports the good produced by its subsidiary at Home, at cost, subject to iceberg transport costs, so that the marginal cost of the MNE headquarters of type r is: $c_r = \varrho R_r$. The final goods markets in Foreign and at Home are monopolistically competitive, hence the MNE (headquarters) sells to final consumers in market $j = F, H$ at price:

$$p_{Mj,r} = \frac{\sigma}{\sigma - 1} \varrho_{Mj} c_r,$$

where $\varrho_{Mj} = 1$ if $j = F$, and $\varrho_{Mj} = \varrho$ if $j = H$. Given the CES final demand in equation (2), MNE sales in $j = F, H$ are:

$$p_{Mj,r} q_{Mj,r} = d_r \left(\frac{\sigma}{\sigma - 1} \varrho_{Mj} c_r \right)^{1-\sigma} D_{j,r}.$$

In turn, one can express the total MNE subsidiary output for an MNE of type r as:

$$M_r = d_r \left(\frac{\sigma}{\sigma - 1} \right)^{-\sigma} \varrho^{1-\sigma} R_r^{-\sigma} \sum_j \varrho_{Mj}^{-\sigma} D_{j,r}. \tag{A14}$$

Finally, total sales of all MNEs across both markets H and F are:

$$Y_M = \frac{\sigma}{\sigma - 1} \varrho \sum_{r=N,R} N_{M,r} R_r \sum_{j=H,F} \varrho_{Mj} M_{j,r}.$$

To close the model and solve for general equilibrium quantities, we write down the income in each country, labor market clearing and trade balance. These steps are detailed next.

Appendix A.1.2 General equilibrium

Denote $L_{Hj,r}^t$ the total number of type t workers at Home working for firms of type r producing for market $j = H, F, M$, and $L_{M,r}^t$ the total labor directly employed at MNE subsidiaries of type r at Home. Labor market clearing at Home yields:

$$\bar{L}_H^t = \sum_{r=R,N} \left\{ \sum_{j=H,M,F} L_{Hj,r}^t + L_{M,r}^t \right\}. \tag{A15}$$

Denote X_j^t the income of type t workers in country j. Workers derive income from their labor, as well as their share in local (non-MNE) firms' profits. The total income of workers of type t at Home is:

$$X_H^t = \sum_{r=R,N} \left\{ \sum_{j=H,M,F} \tilde{w}_{H,r}^t L_{Hj,r}^t + \tilde{w}_{M,r}^t L_{M,r}^t \right\} + \sum_{r=R,N} \sum_{j=H,M,F} \Pi_{Hj,r}^t, \tag{A16}$$

where $\Pi_{Hj,r}^t$ is the share of Home firm profits generated on market j for firms of type r that are apportioned (proportionally to labor income) to type t workers. Given the CES-Pareto setup, profits are a constant fraction of sales and wage bill, in particular one can write:

$$\Pi_{Hj,r}^t = (a - 1) \tilde{w}_{H,r}^t L_{Hj,r}^t, \tag{A17}$$

where we have defined $a \equiv \frac{\theta\sigma}{\theta\sigma - (\sigma - 1)}$. Total income in H is finally:

$$X_H = \sum_{t=l,h} X_H^t.$$

In Foreign, total income is made of labor income, Foreign firm profits and profits made by multinationals (which are a constant fraction of their sales $Y_M = X_{MF} + X_{MH}$):

$$X_F = a_F W_F L_F + \frac{1}{\sigma - 1} (X_{MF} + X_{MH}).$$

In both countries, income equals expenditures: $X_j = \sum_{i=H,F,M} X_{ij}$. Equivalently, trade balance is given by:

$$X_{FH} + X_{MH} = \frac{\sigma - 1}{\sigma} (X_{MF} + X_{MH}) + X_{HF},$$

where X_{ij} denotes expenditure of country $j = H, F$ on final goods produced by firms in country $i = H, F$ or final goods sold by MNEs' headquarters in Foreign when $i = M$. This expression accounts for the fact that MNE subsidiary production is imported from H to F at cost and then sold by the MNE headquarters with a constant markup $\frac{\sigma}{\sigma-1}$ to end consumers in $j = H, F$.

An equilibrium of this economy is a set of wages $\{w_{j,N}^t\}_{j,t}$ and labor allocations $\{L_{ij,r}^t\}_{ij,r,t}$ such that (i) consumers maximize utility; (ii) firms make profit-maximizing decisions, as summarized in the main text; (iii) labor markets clear in both countries; and (iv) trade is balanced as described above.

Appendix A.2   Derivations of the comparative statics

We compute here the first-order effect of RS, where RS is summarized by $\left(\hat{\tau}_R^l, \hat{T}_R, \hat{d}_R, \beta\right)$. Hat notations $\hat{y} = d\log y$ denote log changes in variable y.

Given the definition of the aggregate labor cost index in equation (A2) and the definition of RS in equation (6), it is immediate that:

$$\hat{W}_{H,R} - \hat{W}_{H,N} = \chi_H^l \hat{\tau}_R^l.$$

Similarly, equations (9),(10) and (11) stem directly from log-differentiating equations (6), (8) and (A1). Given the demand in equation (2) and monopolistic competition, markups are constant on the final goods markets (equal to $\frac{\sigma}{\sigma-1}$) so that $\hat{\mu}_{Hj,r} = 0$ for $j = H, F$. On the MNE market, we have defined the partial pass-through in equation (A4) so that:

$$\hat{\mu}_{HM,R} = (\beta - 1)\chi_H^l \hat{\tau}_R^l.$$

Putting together the impact of RS on costs and markups, the relative impact of RS on firms' prices is:

$$\hat{p}_{Hj,R} - \hat{p}_{Hj,N} = \chi_H^l \hat{\tau}_R^l, \quad \text{for } j = H, F,$$
$$\text{and } \hat{p}_{HM,R} - \hat{p}_{HM,N} = \beta\chi_H^l \hat{\tau}_R^l.$$

Turning to sales from equation (A5), notice that aggregate demand shifters on the final goods markets are the same for R and N firms, so that $\hat{D}_{j,R} - \hat{D}_{j,N} = 0$ for $j = H, F$. In contrast, aggregate demand shifters faced by R−suppliers depend on the demand for final goods produced by RS-MNEs, which is different from the one faced by non-RS MNEs. Specifically, using CES demand for MNE goods, one can show that $M_r = d_r \left(\frac{\sigma}{\sigma-1}\right)^{-\sigma} \varrho^{1-\sigma} R_r^{-\sigma} \sum_j \varrho_{Mj}^{-\sigma} D_{j,r}$, so that $\hat{D}_{M,R} - \hat{D}_{M,N} = \hat{d}_R$.[ii] Combining the effect of RS on prices and on aggregate demand shifters yields the following differential sales response in each market:

$$\hat{y}_{Hj,R} - \hat{y}_{Hj,N} = (1 - \sigma)\chi_H^l \hat{\tau}_R^l < 0, \quad \text{for } j = H, F, \tag{A18}$$

$$\hat{y}_{HM,R} - \hat{y}_{HM,N} = (1 - \sigma)\beta\chi_H^l \hat{\tau}_R^l + \hat{d}_R. \tag{A19}$$

Turning to exposed firms, log-differentiating the cutoffs in equation (A12) yields:

$$\hat{z}_{Hj,R}^* - \hat{z}_{Hj,N}^* = 0 \text{ for } j = H, F, \tag{A20}$$

$$\hat{z}_{HM,R}^* - \hat{z}_{HM,N}^* = \frac{\sigma}{\sigma - 1}\chi_H^l \hat{\tau}_R^l - \frac{1}{\sigma - 1}\hat{d}_R. \tag{A21}$$

The expressions (14), (15) and (16) stem from log-differentiating equation (A13) combined with the results

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[ii]The demand shifter on the MNE input market can be computed from the MNE output demand. Given equation (2), MNE sales in $j = F, H$ are $p_{Mj,r}q_{Mj,r} = d_r \left(\frac{\sigma}{\sigma-1}\varrho_{Mj}c_r\right)^{1-\sigma} D_{j,r}$, so that total output for MNE subsidiary of type r is: $M_r = d_r \left(\frac{\sigma}{\sigma-1}\right)^{-\sigma} \varrho^{1-\sigma} R_r^{-\sigma} \sum_j \varrho_{Mj}^{-\sigma} D_{j,r}$.

above on the cutoff. Finally, log-differentiating equation (A14) yields:

$$\widehat{RM}_R - \widehat{RM}_N = \hat{d}_R + (1 - \sigma)\left(\hat{R}_R - \hat{R}_N\right). \tag{A22}$$

To compute the change in the MNE subsidiary output price (also its cost), note that equation (A11) integrated over the MNE suppliers yields:

$$R_r^{1-\sigma} = \mu_{i,r}^{1-\sigma_i} W_{i,r}^{1-\sigma_i} \left(\frac{\theta}{\theta - \sigma + 1}\right)\left(\left[z_{M,r}^*\right]^{\sigma-1-\theta}\right) + \xi^\sigma W_{M,r}^{1-\sigma}. \tag{A23}$$

Log-differentiating this expression yields:

$$\hat{R}_R - \hat{R}_N = \left[\Xi\beta + \Xi\left(\frac{\sigma - 1 - \theta}{1 - \sigma}\right)\frac{\sigma}{\sigma - 1}\right]\chi_H^l\hat{\tau}_R^l - \Xi\left(\frac{\sigma - 1 - \theta}{1 - \sigma}\right)\frac{1}{\sigma - 1}\hat{d}_R \tag{A24}$$

which, combined with equation (A22) yields the desired comparative statics reported in the main text (see equation (17)).

Appendix A.3 Derivations of the welfare effects in the full model

We consider the first-order effect of a small RS policy $\left(\hat{\tau}_R^l, \hat{T}_R, \hat{d}_R, \beta\right)$ implemented by a fraction γ of MNEs, that are otherwise identical to other MNEs. We take the Foreign wage index as the numeraire so that $\hat{W}_F = 0$. We are interested in the change in Welfare for workers of type t,

$$\hat{U}_H^t = \hat{X}_H^t - \hat{P}_H. \tag{A25}$$

Taking log-differentials of equation (A16) yields:

$$\hat{X}_H^t = \Phi^t\left[\hat{w}_{H,N}^t + \phi_{H,R}^t\left(\hat{\tau}_R^t + \hat{T}_R\right) + \phi_M^t\hat{L}_M^t\right] + \left(1 - \Phi^t\right)\left[\hat{w}_{H,N}^t + \hat{L}_H^t + \varphi_{H,R}\left(\hat{\tau}_R^t + \hat{T}_R\right) + \varphi_{HM,R}\hat{a}\frac{a}{a-1}\right], \tag{A26}$$

where Φ^t is the share of the labor income in the income of type t in the initial equilibrium:

$$\Phi^t \equiv \frac{\sum_{j=H,M,F}\chi_H^t X_{Hj}/a + \chi_M^t W_M L_M}{\sum_{j=H,M,F}\chi_H^t X_{Hj} + \chi_M^t W_M L_M}.$$

$\phi_{H,R}^t$ is the share of total Home wage bill for type t corresponding to suppliers that are subject to RS:

$$\phi_{H,R}^t \equiv \frac{\sum_{j=H,M,F}\gamma\phi_{Hj,R}X_{Hj}/a}{\sum_{j=H,M,F}\chi_H^t X_{Hj}/a + \chi_M^t W L_M}.$$

ϕ_M^t is the share of total Home wage bill for type t corresponding to MNE subsidiaries M:

$$\phi_M^t \equiv \frac{\chi_M^t W L_M}{\sum_{j=H,M,F}\chi_H^t X_{Hj}/a + \chi_M^t W L_M}.$$

$\varphi_{H,R}$ is the share of total Home firm profits corresponding to firms that are subject to RS requirements:

$$\varphi_{H,R} \equiv \frac{\sum_{j=H,M,F}\gamma\phi_{Hj,R}X_{Hj}}{\sum_{j=H,M,F}X_{Hj}}.$$

and, finally, $\varphi_{HM,R}$ is the share Home firm profits corresponding to the sales to MNE subsidiaries that will

implement RS:

$$\varphi_{HM,R} \equiv \frac{\gamma X_{HM}}{\sum_{j=H,M,F} X_{Hj}}.$$

These profits will be differentially affected since RS can be accompanied by a reduction in the suppliers' markup, through the imperfect pass-through β of the policy. Specifically,

$$\hat{a} = (\beta - 1) \chi_H^l \hat{\tau}_R^l. \tag{A27}$$

Summing up over both worker types, the change in aggregate total income is

$$\hat{X}_H = \sum_t \frac{X_H^t}{X_H} \hat{X}_H^t. \tag{A28}$$

Denote X_{ij} the expenditure of country $j = H, F$ on final goods produced by firms in country $i = H, F$ or final goods sold by MNEs' headquarters in Foreign when $i = M$. Let P_{ij} denote the corresponding price index. Given the CES demand in equation (2), changes in expenditure are given by:

$$\hat{X}_{ij} = (1 - \sigma)\left(\hat{P}_{ij} - \hat{P}_j\right) + \hat{X}_j \qquad \text{for } i, j = H, F, \tag{A29}$$

$$\hat{X}_{Mj} = \gamma \hat{d}_R + (1 - \sigma)\left(\hat{P}_{Mj} - \hat{P}_j\right) + \hat{X}_j \qquad \text{for } j = H, F, \tag{A30}$$

$$\hat{X}_{HM,r} = (1 - \sigma)\left(\hat{P}_{M,r} - \hat{R}_r\right) + \widehat{R_r M}_r \qquad \text{for } r = N, R, \tag{A31}$$

$$\hat{X}_{M,r} = \widehat{R_r M}_r = \hat{d}_r + \sum_{j=H,F} \frac{X_{Mj}}{X_{MH} + X_{MF}}\left[(1 - \sigma)\left(\hat{R}_r - \hat{P}_j\right) + \hat{X}_j\right], \tag{A32}$$

$$\hat{Y}_M = \gamma \widehat{R_R M}_R + (1 - \gamma) \widehat{R_N M}_N. \tag{A33}$$

Price index changes are given by:

$$\hat{P}_j = \sum_{i=H,F,M} \lambda_{ij} \hat{P}_{ij} \qquad \text{for } i, j = H, F, \tag{A34}$$

$$\hat{P}_{ij} = \hat{W}_{i,N} + \gamma \phi_{ij} \chi_i^l \hat{\tau}_{i,T}^l + \frac{\theta - (\sigma - 1)}{\sigma - 1} \hat{z}_{ij} \qquad \text{for } i, j = H, F, \tag{A35}$$

$$\hat{P}_{HM,r,} = \hat{W}_{i,N} + \beta \chi_H^l \hat{\tau}_{H,r}^l + \frac{\theta - (\sigma - 1)}{\sigma - 1} \hat{z}_{HM,r} \qquad \text{for } r = N, R, \tag{A36}$$

$$\hat{R}_r = \Xi \hat{P}_{HM,r} + (1 - \Xi) \hat{W}_{M,r} \qquad \text{for } r = N, R, \tag{A37}$$

$$\hat{P}_{Mj} = (1 - \gamma) \hat{R}_N + \gamma\left(\hat{R}_R - \frac{1}{\sigma - 1}\hat{d}_R\right) \qquad \text{for } j = H, F, \tag{A38}$$

where we have used the usual notation for trade shares, $\lambda_{ij} = \frac{X_{ij}}{X_j}$, while the threshold changes are:

$$\hat{z}_{ij} = \frac{\sigma}{\sigma - 1}\hat{W}_{i,N} - \hat{P}_j - \frac{1}{\sigma - 1}\hat{X}_j \qquad \text{for } i = H; j = H, F, \tag{A39}$$

$$\hat{z}_{Fj} = 0, \tag{A40}$$

$$\hat{z}_{HM,r} = \frac{\sigma}{\sigma - 1}\hat{W}_{H,r} - \frac{1}{\sigma - 1}\hat{d}_r - \sum_{j=H,F} \frac{X_{Mj}}{X_{MH} + X_{MF}}\left[\hat{P}_j + \frac{1}{\sigma - 1}\hat{X}_j\right] \qquad \text{for } r = N, R. \tag{A41}$$

Log-differentiating Foreign income and the trade balance yields:

$$\hat{X}_F = \frac{w_F L_F}{w_F L_F + \frac{1}{\sigma-1} E_x} \hat{W}_F + \frac{\frac{1}{\sigma-1} Y_M}{w_F L_F + \frac{1}{\sigma-1} Y_M} \hat{Y}_M, \tag{A42}$$

$$\frac{X_{FH}}{X_{FH} + \frac{1}{\sigma} X_{MH}} \hat{X}_{FH} + \frac{\frac{1}{\sigma} X_{MH}}{X_{FH} + \frac{1}{\sigma} X_{MH}} \hat{X}_{MH} = \frac{\frac{\sigma-1}{\sigma} X_{MF}}{X_{HF} + \frac{\sigma-1}{\sigma} X_{MF}} \hat{X}_{MF} + \frac{X_{HF}}{X_{HF} + \frac{\sigma-1}{\sigma} X_{MF}} \hat{X}_{HF}. \tag{A43}$$

Changes in wage indexes are given by:

$$\hat{W}_{H,R} - \hat{W}_{H,N} = \chi_H^l \hat{\tau}_R^l, \tag{A44}$$

$$\hat{W}_{M,R} - \hat{W}_{M,N} = 0, \tag{A45}$$

as workers directly working at MNEs are not impacted by the RS shock – they are already subjected to better labor conditions before the MNE implements RS.

Changes in labor allocations $\hat{L}_H^t$ and $\hat{L}_M^t$ needed in equation (A26) are given by noting that $\hat{L}_H^t = -\hat{L}_M^t \frac{L_M^t}{L_H^t}$, and by using the MNE's change in labor demand, given CES combination of high- and low-wage workers:

$$\hat{WL}_{M,r} = (1-\sigma)\left(\hat{W}_{M,r} - \hat{W}_{H,r}\right) + \hat{X}_{M,r} \qquad \text{for } r = R, N, \tag{A46}$$

$$\hat{wL}_{M,r}^t = (1-\rho)\left(\hat{w}_H^t - \hat{W}_M\right) + \hat{WL}_{M,r} \qquad \text{for } t = l, h; r = R, N, \tag{A47}$$

$$\hat{wL}_M^t = (1-\rho)\left(\hat{w}_H^t - \hat{W}_M\right) + \gamma(1-\sigma)\left(\hat{W}_M - \hat{W}_{H,R}\right) + \quad (1-\gamma)(1-\sigma)\left(\hat{W}_M - \hat{W}_{H,N}\right) \tag{A48}$$

$$+ \gamma \hat{X}_{M,R} + (1-\gamma)\hat{X}_{M,N} \text{ for } t = l, h; r = R, N,$$

so that overall:

$$\hat{L}_M^t = (1-\gamma)\hat{wL}_{M,N}^t + \gamma \hat{wL}_{M,R}^t - \hat{w}_{H,N}^t \text{ for } t = l, h. \tag{A49}$$

Finally, log-differentiating the labor market clearing equation leads to:

$$\hat{w}_{H,N}^h - \hat{w}_{H,N}^l = \frac{\varphi_{H,R} \Phi_{labor}^h \hat{\tau}_{H,R}^l + \frac{1}{\rho}\left(1 - \tau_M^{-\rho}\right)\left(1 - \Phi_{labor}^h\right)\hat{L}_M^h}{1 - \left(1 - \tau_M^{-\rho}\right)\left(1 - \Phi_{labor}^h\right)}, \tag{A50}$$

where Φ_{labor}^t is the share of workers of type t hired by firms, rather than by MNE subsidiaries.

$$\Phi_{labor}^t \equiv \frac{\sum_{j=H,M,F} X_{Hj}/a}{\sum_{j=H,M,F} X_{Hj}/a + \frac{\chi_M^t}{\chi_H^t}\frac{W_M L_M}{T_M}}.$$

The change in welfare for Home workers of type t is given by the solution of the system of equations (A25)-(A50).

Distributional implications To compute the welfare impact of RS on exposed workers, we write that

$$X_H^{t,E} = \left(1 + \Pi^0\right) w_H^t L_H^{t,E}$$

where

$$\Pi^0 = \frac{\frac{a-1}{a}\sum_{j=H,M,F} X_{Hj}}{W_H L_H + W_M L_M}$$

measures that aggregate domestic profits are redistributed to workers, proportional to their wage. The number of exposed workers is fixed (corresponds to those working for exposed suppliers). Therefore,

$$\hat{X}_H^{t,E} = \hat{w}_H^t + \hat{\tau}^t + \hat{T}^t + \hat{\Pi}^0 (1 - \Phi)$$

where Φ is the share of labor income in total income of domestic workers, $\Phi = \frac{\sum_{j=H,M,F} X_{Hj}/a + W_M L_M}{\sum_{j=H,M,F} X_{Hj} + W_M L_M}$. Changes in aggregate profits depend on changes in markups corresponding to suppliers selling to RS-MNE's, as well as changes in the composition of domestic production. Indeed, when MNE subsidiaries expand, the corresponding profit is not redistributed to domestic workers, so aggregate profits decrease when $\hat{L}_M^t$ increases.

Specifically, we find:

$$\hat{\Pi}^0 = \frac{a}{a-1} \phi_{H,R}^t \hat{a} - \phi_M \sum_{t=l,h} \left(\frac{L_M^t}{L_H^l + L_H^h} + \frac{L_M^t}{L_M^l + L_M^h} \right) \hat{L}_M^t,$$

where ϕ_M is the share of total Home wage bill corresponding to MNE subsidiaries:

$$\phi_M \equiv \frac{W L_M}{\sum_{j=H,M,F} X_{Hj}/a + W L_M}$$

and $\phi_{H,R}$ is the share of total wage bill of workers employed in domestic firms corresponding to supplying MNE's that will implement RS:

$$\phi_{H,R} = \frac{W_{HM,R} L_{HM,R}}{W_H L_H}$$

so that overall, the welfare impact of RS on exposed workers is:

$$\hat{U}_H^{t,E} = \hat{w}_H^t + \hat{\tau}^t + \hat{T}^t + (1 - \Phi) \left(\frac{a}{a-1} \phi_{H,R}^t \hat{a} - \phi_M \sum_{t=l,h} \left(\frac{L_M^t}{L_H^l + L_H^h} + \frac{L_M^t}{L_M^l + L_M^h} \right) \hat{L}_M^t \right)$$

Appendix A.4 Derivations in the simplified model

Appendix A.4.1 Derivations of the aggregate welfare effects in the simplified model

Under the simplifying assumptions made in Section 2.4, we have: $X_{HF} = X_{MH} = 0$, $\Xi = 1$, $\sigma - 1 \to \theta$, $\gamma = 1$ so that $X_{HM} = X_{HM,R}$ and MNEs are owned by absentee capitalists so that $\hat{X}_F = \hat{W}_F$. The system of equations (A25)-(A50) simplifies as follows. The changes in incomes are given by:

$$\hat{X}_H = \hat{W}_{H,N} + \Lambda \lambda_{HH} \chi_H^l \hat{\tau}_{H,R}^l + \lambda_{FH} \beta \chi_H^l \hat{\tau}_{H,r}^l + (\Lambda \lambda_{HH} + \lambda_{FH}) \hat{T}_R,$$
$$\hat{X}_F = 0.$$

The change in the Home price index is simply:

$$\hat{P}_H = \lambda_{HH} \left(\hat{W}_{H,N} + \Lambda \chi_H^l \hat{\tau}_{H,R}^l \right), \tag{A51}$$

so that the change in aggregate welfare is:

$$\hat{U}_H = (1 - \lambda_{HH}) \hat{W}_{H,N} + \beta \lambda_{FH} \chi_H^l \hat{\tau}_{H,R}^l + (\Lambda \lambda_{HH} + \lambda_{FH}) \hat{T}_R.$$

Trade balance finally pins down the change in the Home wage index. Given simple trade patterns,

$$\hat{\lambda}_{FH} + \hat{X}_H = \hat{\lambda}_{MF},$$

where the relevant changes in expenditures are given through CES demand by:

$$\hat{\lambda}_{MF} = \lambda_{FF}\hat{d}_R + \lambda_{FF}(1-\sigma)\left(\hat{W}_{H,N} + \beta\chi_H^l\hat{\tau}_{H,R}^l\right) \text{ and}$$

$$\hat{\lambda}_{FH} = (\sigma-1)\lambda_{HH}\left(\hat{W}_{H,N} + \Lambda\chi_H^l\hat{\tau}_{H,R}^l\right).$$

Solving out for the Home price index yields:

$$\hat{W}_{H,N} = -\frac{(\lambda_{FF}(\sigma-1)\beta + \sigma\lambda_{HH}\Lambda + \lambda_{FH}\beta)\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})\hat{T}_R - \lambda_{FF}\hat{d}_R}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma-1)},$$

so that finally, the change in aggregate welfare is:

$$\hat{U}_H = (\beta - \Lambda)\underbrace{\frac{\lambda_{HH}\lambda_{FH}\sigma}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma-1)}}_{\equiv W_{tax}}\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})\underbrace{\frac{(\sigma\lambda_{HH} + \lambda_{FF}(\sigma-1))}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma-1)}}_{\equiv W_{prod}}\hat{T}_R$$

$$+ \lambda_{FH}\underbrace{\frac{\lambda_{FF}}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma-1)}}_{\equiv W_d}\hat{d}_R. \quad \text{(A52)}$$

Appendix A.4.2   Derivations of the distributional implications in the simplified model

Distributional effects for low- vs. high-wage workers   To disentangle the effect of the policy on low- and high-wage workers, note that labor market clearing yields:

$$\hat{w}_{H,N}^l - \hat{w}_{H,N}^h = -(\Lambda\lambda_{HH} + \lambda_{FH})\hat{\tau}_{H,R}^l,$$

while the change in income for worker type t is given by:

$$\hat{X}_H^t = \hat{w}_{H,N}^t + (\Lambda\lambda_{HH} + \lambda_{FH})\left(\hat{T}_R + \hat{\tau}_{H,R}^t\right) + \lambda_{FH}(\beta-1)\chi_H^l\hat{\tau}_{H,R}^l, \quad \text{(A53)}$$

as profits are apportioned to the wage bill. Overall,

$$\hat{U}_H^l - \hat{U}_H^h = \hat{X}_H^l - \hat{X}_H^h = \left(\hat{w}_{H,N}^l - \hat{w}_{H,N}^h\right) + (\Lambda\lambda_{HH} + \lambda_{FH})\left(\hat{\tau}_{H,R}^l\right) = 0,$$

so that low- and high-wage workers benefit on average from the exact same welfare gains:

$$\hat{U}_H^l = \hat{U}_H^h = \hat{U}_H. \quad \text{(A54)}$$

Distributional effects for exposed vs. non-exposed workers   Exposed low- or high-wage workers are defined as those who were working at RS-MNE suppliers before the policy was rolled out. The exposed group is index by superscript E. We have:

$$X_H = X_{HH} + X_{HM},$$
$$X_H^E = \Lambda X_{HH} + X_{HM},$$

where X_H^E is exposed income (and for type t: $X_H = \chi_H^t X_H$, $X_H = \chi_H^{t,E} X_H^E$). Using derivations similar to the ones in the main model, we have:

$$\hat{X}_H^{t,E} = \hat{w}_{H,N}^t + \hat{T}_R + \hat{\tau}_{H,R}^t + \phi_{Ra}^t\hat{a},$$

while

$$\hat{X}_H^{t,NE} = \hat{w}_{H,N}^t + \phi_{Ra}^t \hat{a},$$

where $\phi_{Ra}^t \hat{a}$ is the change in per-capita profit, redistributed to all workers irrespective of whether they are exposed or not. Since both groups face the same change in the price index (given by equation (A51)), we have, in relative terms:

$$\Delta \hat{U}_H^t \equiv \hat{U}_H^{t,E} - \hat{U}_H^{t,NE} = \hat{X}_H^{t,E} - \hat{X}_H^{t,NE} = \hat{T}_R + \hat{\tau}_{H,R}^t,$$

which is different for high- vs. low-wage workers because of the term $\hat{\tau}_{H,R}^t$.

Using that $\Gamma^{t,E} \hat{U}_H^{t,E} + \left(1 - \Gamma^{t,E}\right) \hat{U}_H^{t,NE} = \hat{U}_H^t$ where $\hat{U}_H^t$ is given by equation (A54) and $\Gamma^{t,E} \equiv \frac{X_H^{t,E}}{X_H^t}$, we find:

$$\hat{U}_H^{t,E} = \hat{U}_H + \lambda_{HH} (1 - \Lambda) \Delta \hat{U}_H^t,$$
$$\hat{U}_H^{t,NE} = \hat{U}_H - (\Lambda \lambda_{HH} + \lambda_{FH}) \Delta \hat{U}_H^t.$$

That is, using equation (A52):

$$\hat{U}_H^{t,NE} = \left[(\beta - \Lambda) W^{tax} \chi_H^l - (\lambda_{FH} + \Lambda \lambda_{HH})\right] \hat{\tau}_R^l + (\lambda_{FH} + \Lambda \lambda_{HH}) \left(W^{prod} - 1\right) \hat{T}_R + W_d \hat{d}_R.$$

It is immediately clear that $W_{prod} - 1 = \frac{-1 + \lambda_{HH}}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma - 1)} < 0$, so that the second term is negative. One can also show that for $\beta \leq 1$, $(\beta - \Lambda) W^{tax} < (\lambda_{FH} + \Lambda \lambda_{HH}) W^{prod}$. To that end, note that

$$\lambda_{HH} \lambda_{FH} < \lambda_{FH} \left[\lambda_{HH} + \lambda_{FF} \left(\frac{\sigma - 1}{\sigma}\right)\right],$$

therefore for any $\Lambda \geq 0$, the following is also true:

$$\lambda_{HH} \lambda_{FH} (1 - \Lambda) < (\Lambda \lambda_{HH} + \lambda_{FH}) \left[\lambda_{HH} + \lambda_{FF} \left(\frac{\sigma - 1}{\sigma}\right)\right].$$

Hence

$$\lambda_{HH} \lambda_{FH} \sigma (1 - \Lambda) < (\Lambda \lambda_{HH} + \lambda_{FH}) \left[\sigma \lambda_{HH} + \lambda_{FF} (\sigma - 1)\right],$$

which means that

$$(1 - \Lambda) W^{tax} < (\lambda_{FH} + \Lambda \lambda_{HH}) W^{prod},$$

and in turn, for any $\beta \leq 1$ and $\chi_H^l \leq 1$:

$$(\beta - \Lambda) W^{tax} \chi_H^l < (\lambda_{FH} + \Lambda \lambda_{HH}) W^{prod}.$$

Therefore,

$$(\beta - \Lambda) W^{tax} \chi_H^l - (\lambda_{FH} + \Lambda \lambda_{HH}) < (\lambda_{FH} + \Lambda \lambda_{HH}) W^{prod} - (\lambda_{FH} + \Lambda \lambda_{HH}) < 0.$$

To conclude, the first and second terms in $\hat{U}_H^{t,NE}$ are unambiguously negative while only the last term is positive.

Appendix A.5   Alternative model with labor market power

Appendix A.5.1   Setup

A natural question is whether RS policies are implemented in a context where wages are too low in the first place. In the baseline model presented in the main text, wages are those that clear the market – they are not too low from an efficiency perspective, and raising them introduces, *a priori*, a distortion.

Alternatively, it could be that wages are set too low compared to an efficient benchmark. Capturing this possibility requires Home firms to exert labor market power on the Home labor market. We now extend the model to feature an upward-sloping labor supply curve that Home firms are facing in order to entertain this possibility (of pre-existing wage markdowns), summarized as follows. To generate this feature in the most tractable way, we assume that, in addition to their preferences over a CES consumption bundle, workers have heterogeneous preferences for jobs. Utility of worker h working on production line ω is:

$$U^h = C\varepsilon^h(\omega),$$

where $C = \left(\int_{\Omega^k} d_\omega q_\omega^{\frac{\sigma-1}{\sigma}} d\omega\right)^{\frac{\sigma}{\sigma-1}}$ as above, and idiosyncratic preferences $\varepsilon^h(\omega)$ are drawn i.i.d across workers and production lines, according to a Fréchet distribution with shape parameter κ. Workers are, therefore, ex-ante homogeneous but ex-post heterogeneous. Production of firms and MNEs are otherwise unchanged, with, for simplicity, only one ex-ante worker type, whose exogenous aggregate supply is L_k in country k. That is, workers are perfect substitutes in production and ℓ_ω is the number of workers hired on production line ω. With this setup, firms face an upward-sloping labor supply curve when hiring on their production line ω :

$$\frac{\ell_\omega}{L_H} = \left(\frac{w_\omega}{\Phi}\right)^\kappa; \text{with } \Phi = \left(\int_{\Omega_H \cup \Omega_x} w_\omega{}^\kappa d\omega\right)^{\frac{1}{\kappa}}. \tag{A55}$$

Notice that when $\kappa \to \infty$, the model collapses to a familiar setup in which all workers are identical and firms face a perfectly elastic labor supply, as in our baseline model with one type of worker (nested in the main one). Importantly, we assume here that firms set wages according to monopsonistic competition. Because they face a firm-specific upward-sloping labor supply curve, firms restrict hiring to keep the wages of all their workers low. Formally, taking the first-order condition for profit maximization of the supplier leads to the following wage profile across heterogeneous firms and across production lines:

$$w_{Hj,r} = \frac{\sigma-1}{\sigma}\frac{\kappa}{\kappa+1}zp_{Hj,r}.$$

Firms optimally set wages at a markdown $\frac{\kappa}{\kappa+1}$ over their marginal revenue product of labor. Using the product market clearing on the output markets pins down the scale of production of each firm on each production line, given this wage-price schedule. In equilibrium, a firm with productivity z on production line $j = H, F, M$ optimally offers wages:

$$w^*_{Hj,r} = z^{\frac{\sigma-1}{\kappa+\sigma}} \Phi^{\frac{\kappa}{\kappa+\sigma}} D_{j,r}^{\frac{1}{\kappa+\sigma}} L_H^{-\frac{1}{\kappa+\sigma}} \left(\frac{\sigma-1}{\sigma}\frac{\kappa}{\kappa+1}\right)^{\frac{\sigma}{\kappa+\sigma}}, \tag{A56}$$

where the demand shifters $D_{j,r}$ on market j are defined in equations (A8) and (A9). When wages are optimally chosen, the sales of a firm with productivity z on market j are given by:

$$y_{Hj,r} = z^{\frac{(\sigma-1)(\kappa+1)}{\kappa+\sigma}} \Phi^{\frac{\kappa(1-\sigma)}{\kappa+\sigma}} (D_{j,r})^{\frac{1+\kappa}{\kappa+\sigma}} L_H^{\frac{\sigma-1}{\kappa+\sigma}} \left(\frac{\sigma-1}{\sigma}\frac{\kappa}{\kappa+1}\right)^{\frac{\kappa(\sigma-1)}{\kappa+\sigma}}.$$

Note that if a wage $\underline{w}$ is imposed on the firm through RS, rather than being chosen optimally by the firm, firm sales depend on whether hiring is determined by the labor supply curve (which is the case when labor supply $\leq$ labor demand), or whether it is determined by the labor demand curve (when labor supply $\geq$ labor demand). In the former case, we have:

$$y_{Hj,R} = \frac{\sigma}{\sigma-1}\underline{w}^\kappa \Phi^{1-\kappa}\Gamma\left(1-\frac{1}{\kappa}\right)L_H, \tag{A57}$$

where Γ is the Gamma function. In the latter case, we have:

$$y_{Hj,R} = \left(\frac{\sigma}{\sigma-1}\right)^{1-\sigma} z^{\sigma-1} \underline{w}^{1-\sigma} D_{j,r}. \tag{A58}$$

Appendix A.5.2   Comparative statics

Next, we examine how RS impacts firm sales under the hypothesis that labor markets are monopsonistic. Our strategy is still to compare firms with similar productivity, some being exposed to RS, and others not. Given that wages are heterogeneous, we model the RS policy as a wage floor that stipulates that $w_i, R \geq \underline{w}$ Given that the RS policy $\underline{w}$ is binding only for firms at which wages are low, several cases arise, depending on where the firm wage, pre-RS, lies compared to the wage floor $\underline{w}$ imposed by the RS policy. To that end, we denote $w_k^*(z)$ the monopsony wage level of a firm with productivity z on production line $k = H, F, M$. Three main cases arise.

First, if $w_k^*(z) \geq \underline{w}$, that is, given equation (A56), when firm productivity is high enough, RS is not binding. There is no relative effect of RS on suppliers that adopt it vs. those with equivalent productivity that do not.

Second, when $w_k^*(z) < \underline{w} \leq \frac{\kappa+1}{\kappa} w_k^*(z)$, RS is now binding and corresponds to a wage increase from $w_k^*(z)$ to $\underline{w}$ for impacted firms. In this case, the sales of compliers go up, both on the final goods markets and on the intermediate goods market. This sales increase comes from the following mechanism: higher wages make the firm hire more employees compared to the monopsonistic case where the firm voluntarily restricted its hiring. This leads to higher production and higher sales, given that the wage (hence price) increase is moderate - but of course, to lower profits.[iii]

Third, if $\underline{w} > \frac{\kappa+1}{\kappa} w_k^*(z)$, which could be the case for the lowest productivity firms, these firms see their sales decrease. The wage increase is too high to sustain higher sales.

Overall, we have the following comparative statics for compliers, for $k = H, F, M$:

$$\begin{cases} \hat{y}_{k,R} - \hat{y}_{k,N} = 0 & \text{if } w_k^*(z) \geq \underline{w} \\ \hat{y}_{k,R} - \hat{y}_{k,N} \geq 0 & \text{if } w_k^*(z) \leq \underline{w} \leq \frac{\kappa+1}{\kappa} w_k^*(z) \\ \hat{y}_{k,R} - \hat{y}_{k,N} \leq 0 & \text{if } w_k^*(z) \leq \frac{\kappa+1}{\kappa} \underline{w} \end{cases}$$

In practice, note that this third case is likely to be of limited empirical relevance. First, because these lower productivity firms are likely to exit the market. Second, because the RS wage is unlikely to be high enough to trigger a wage increase of more than $\frac{\kappa+1}{\kappa}$, which corresponds to a 20% increase in wages for typical values of the parameter κ.[iv] Therefore, we expect that on average for complying firms,

$$\hat{y}_{k,R} - \hat{y}_{k,N} \geq 0, \tag{A59}$$

both on the final goods market and on the MNE input market.

Turning to the effect on exposed firms, we need to take into account the extensive margin effect of the RS policy, in addition to this positive effect of RS on the intensive margin. Because the RS policy reduces profits for all firms for which RS is binding, the policy is accompanied by exits of preexisting suppliers that were close to the selection cutoff. Therefore, the effect of the RS policy on exposed firms is overall

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[iii]These qualitative patterns mask two different subcases: one where firm hiring is set by the labor supply curve, hence sales are given by (A57). This happens so long as $\underline{w} \leq w^{eq}$, where w_k^{eq} is a firm-specific equilibrium wage for which labor supply equals labor demand on production line k. In the other subcase, the wage increase is high enough that the labor supply is higher than labor demand, hence sales are pinned down by equation (A58), but the wage increase is not too high, so that labor hired is still above the monopsonistic level.

[iv]For instance, Berger et al. (2022) find values of the labor supply elasticity ranging from $\kappa \in (3, 7)$, which leads to $\frac{1}{\kappa-1} \in (16\%, 50\%)$.

ambiguous, i.e.,:

$$\hat{Y}_{tot,R} - \hat{Y}_{tot,N} \text{ has an ambiguous sign.}$$

Appendix A.6   Robustness

Appendix A.6.1   Robustness with unemployment in the simple model

We recompute the welfare gains of a representative worker $\hat{U}_H$, now assuming that there is unemployment in the economy. Specifically, workers choose whether to be unemployed and get a fixed utility u_0, or work and get utility $\frac{\bar{w}}{P_H}$. Each worker has idiosyncratic preferences for either option that are assumed to be distributed Fréchet, mean 1 and shape κ. Formally,

$$U(\omega) = \max\left\{ \frac{\bar{w}}{P_H}\epsilon_w(\omega), u_0\epsilon_u(\omega) \right\},$$

where $\bar{w} = \frac{X_H}{L_{H,N}+L_{H,R}} = \frac{w_H L_{H,N} + w_H L_{H,R}(1+\tilde{t}) + \Pi_{H,N} + \Pi_{H,R}}{L_{H,N}+L_{H,R}}$ is the income per capita in the employed sector. Labor market clearing writes:

$$L_{H,N} + L_{H,R} + L_{H,U} = L_H.$$

Given the properties of the Fréchet distribution, the share of unemployed workers λ^U is:

$$\lambda^U = \frac{L_{H,U}}{L_H} = \frac{u_0^\kappa}{u_0^\kappa + \left(\frac{\bar{w}}{P_H}\right)^\kappa}. \tag{A60}$$

We now compute how the expected welfare in the economy,

$$U^H = \mathbb{E}(U) \propto \left(u_0^\kappa + \left(\frac{\bar{w}}{P_H}\right)^\kappa \right)^{\frac{1}{\kappa}}, \tag{A61}$$

will change following RS. Given equation (A61), a small shock to the economy yields:

$$\hat{U}_H = \left(1 - \lambda^U\right)\left(\hat{\bar{w}} - \hat{P}_H\right), \tag{A62}$$

with

$$\widehat{L_{H,N} + L_{H,R}} = \left(\hat{\bar{w}} - \hat{P}_H\right)\kappa\lambda^U.$$

First, we compute $\hat{\bar{w}} - \hat{P}_H$. As in the baseline case, income per capita changes according to:

$$\hat{\bar{w}} = \hat{W}_{H,N} + \Lambda\lambda_{HH}\chi_H^l\hat{\tau}_{H,R}^l + \lambda_{FH}\beta\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})\hat{T}_R, \tag{A63}$$

while the expression for the change in the price index is unchanged compared to the baseline case so that:

$$\hat{\bar{w}} - \hat{P}_H = \lambda_{FH}\hat{W}_{H,N} + \lambda_{FH}\beta\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})\hat{T}_R. \tag{A64}$$

Second, we use the trade balance to solve for $\hat{W}_{H,N}$ as a function of $\hat{\bar{w}} - \hat{P}_H$:

$$\hat{X}_H = \hat{\lambda}_{MF} - \hat{\lambda}_{FH},$$
$$\hat{X}_H - \hat{P}_H = \hat{\lambda}_{MF} - \hat{\lambda}_{FH} - \hat{P}_H,$$
$$\left(\hat{\bar{w}} - \hat{P}_H\right)\left(1 + \kappa\lambda^U\right) = \hat{\lambda}_{MF} - \hat{\lambda}_{FH} - \hat{P}_H.$$

Using, as in the baseline case:

$$\hat{\lambda}_{MF} = \hat{d}_R + (1 - \lambda_{MF})(1 - \sigma)\left(\hat{W}_{H,N} + \beta\chi_H^l\hat{\tau}_{H,R}^l\right),$$

$$\hat{\lambda}_{FH} = (\sigma - 1)\lambda_{HH}\left(\hat{W}_{H,N} + \Lambda\chi_H^l\hat{\tau}_{H,R}^l\right),$$

we get:

$$\hat{W}_{H,N} = \left(\hat{\tilde{w}} - \hat{P}_H\right)\frac{(1 + \kappa\lambda^U)}{(\lambda_{FF} + \lambda_{HH})(1 - \sigma) - \lambda_{HH}} - \left[\frac{(1 - \sigma)\lambda_{FF}\beta - \sigma\lambda_{HH}\Lambda}{(\lambda_{FF} + \lambda_{HH})(1 - \sigma) - \lambda_{HH}}\right]\chi_H^l\hat{\tau}_{H,R}^l$$
$$- \frac{1}{(\lambda_{FF} + \lambda_{HH})(1 - \sigma) - \lambda_{HH}}\hat{d}_R.$$

Therefore, using equation (A64), we have:

$$\hat{\tilde{w}} - \hat{P}_H = \frac{(\lambda_{FF} + \lambda_{HH})(1 - \sigma) - 1}{(\lambda_{FF} + \lambda_{HH})(1 - \sigma) - 1 - \lambda_{FH}\kappa\lambda^U}\left\{(\beta - \Lambda)W_{tax}\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})W_{prod}\hat{T}_R + W_d\hat{d}_R\right\},$$

so that overall:

$$\hat{U}_H = \frac{1 - \lambda^U}{1 + \frac{\lambda_{FH}\kappa\lambda^U}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma - 1)}}\left\{\underbrace{(\beta - \Lambda)W_{tax}\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})W_{prod}\hat{T}_R + W_d\hat{d}_R}_{\text{baseline }\hat{U}_H}\right\}.$$

We see that the aggregate welfare gains of the baseline case are dampened by the term: $\frac{1 - \lambda^U}{1 + \frac{\lambda_{FH}\kappa\lambda^U}{1 + (\lambda_{FF} + \lambda_{HH})(\sigma - 1)}}$

in the presence of unemployment.

Appendix A.6.2   Extension with a more general demand system

We allow here for a more flexible demand system faced by CR firms, with different elasticities of substitution between the final goods and the intermediate input markets. Specifically, we assume that:

$$U_i = \left(\int_{\Omega_i} d_\omega q_\omega^{\frac{\sigma_i - 1}{\sigma_i}} d\omega\right)^{\frac{\sigma_i}{\sigma_i - 1}}, \text{ for } i = H, F,$$

$$M = \left(\int_{\Omega_x} m_{\omega(x)}^{\frac{\sigma_M - 1}{\sigma_M}} d\omega(x) + \xi\ell_M^{\frac{\sigma_M - 1}{\sigma_M}}\right)^{\frac{\sigma_M}{\sigma_M - 1}},$$

with $\sigma_H = \sigma_F$ but σ_M is possibly different.

Comparative statics   The comparative statics are modified as follows. The relative impact of RS on firms' output prices is unchanged, but firm sales on destination market $j = H, F, M$ for a firm with RS status $r = R$ or N are now given by:

$$y_{Hj,r} = p_{Hj,r}^{1 - \sigma_j} D_{j,r}, \tag{A65}$$

where

$$D_{j,r} = P_j^{\sigma_j - 1}X_j \quad \text{for } j = H, F,$$
$$\text{and } D_{M,r} = N_r R_r^M M_r.$$

Therefore, computations for the sales on the final goods market (where the relevant elasticity of

substitution is σ_H) are unchanged and the sales to the MNE become:

$$y_{HM,r} = p_{HM,r}^{1-\sigma_M} N_r R_r^{\sigma_M-\sigma_H} d_r \left(\frac{\sigma_H}{\sigma_H-1} \varrho_{Mj} \right)^{-\sigma_H} (\varrho)^{1-\sigma_H} \sum_j \varrho_{Mj}^{-\sigma_H} D_{j,r}.$$

The comparative statics on the sales of compliers are:

$$\hat{y}_{Hj,R} - \hat{y}_{Hj,N} = (1-\sigma_H) \chi_H^l \hat{\tau}_R^l < 0, \quad \text{for } j = H, F, \tag{A66}$$

$$\hat{y}_{HM,R} - \hat{y}_{HM,N} = (1-\sigma_M) \beta \chi_H^l \hat{\tau}_R^l + (\sigma_M - \sigma_H) \Xi \left(\frac{\beta + \left(\frac{\sigma_M-1-\theta}{1-\sigma_M} \right) \frac{\sigma_M}{\sigma_M-1}}{1 + \Xi \left(\frac{\sigma_M-1-\theta}{1-\sigma_M} \right) \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \chi_H^l \hat{\tau}_R^l \tag{A67}$$

$$+ \hat{d}_R \left(1 - (\sigma_M - \sigma_H) \left(\frac{\Xi \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{1}{\sigma_M-1}}{1 + \Xi \left(\frac{\theta-\sigma_M+1}{\sigma_M-1} \right) \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \right).$$

Turning to exposed firms, the relative change in the productivity cutoff for serving the MNE market is:

$$\hat{z}_{HM,R}^* - \hat{z}_{HM,N}^* = \frac{\sigma_M}{\sigma_M-1} \chi_H^l \hat{\tau}_R^l - \frac{\sigma_M-\sigma_H}{\sigma_M-1} \left(\frac{\Xi \beta \chi_H^l \hat{\tau}_R^l + \Xi \left(\frac{\sigma_M-1-\theta}{1-\sigma_M} \right) \frac{\sigma_M}{\sigma_M-1} \chi_H^l \hat{\tau}_R^l - \Xi \frac{\sigma_M-1-\theta}{1-\sigma_M} \frac{1}{\sigma_M-1} \hat{d}_R}{1 + \Xi \left(\frac{\sigma_M-1-\theta}{1-\sigma_M} \right) \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) - \frac{1}{\sigma_M-1} \hat{d}_R,$$

so that the impact of RS on exposed firms (including total sales) is:

$$\hat{Y}_{Hj,R} - \hat{Y}_{Hj,N} = (1-\sigma_H) \chi_H^l \hat{\tau}_R^l < 0, \quad \text{for } j = H, F, \tag{A68}$$

$$\hat{Y}_{HM,R} - \hat{Y}_{HM,N} = \left\{ (1-\sigma_M)\beta - (\theta - \sigma_M + 1) \frac{\sigma_M}{\sigma_M-1} + \frac{\theta(\sigma_M-\sigma_H)}{\sigma_M-1} \left(\frac{\beta + \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M}{\sigma_M-1}}{1 + \Xi \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \Xi \right\} \chi_H^l \hat{\tau}_R^l \tag{A69}$$

$$+ \left(\frac{\theta}{\sigma_M-1} - (\sigma_M - \sigma_H) \frac{\theta}{\sigma_M-1} \left(\frac{\frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{1}{\sigma_M-1}}{1 + \Xi \left(\frac{\theta-\sigma_M+1}{\sigma_M-1} \right) \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \Xi \right) \hat{d}_R,$$

$$\hat{Y}_{Htot,R} - \hat{Y}_{Htot,N} = (1-\zeta)(1-\sigma_H) \chi_H^l \hat{\tau}_R^l \tag{A70}$$

$$+ \zeta \left\{ (1-\sigma_M)\beta - (\theta - \sigma_M + 1) \frac{\sigma_M}{\sigma_M-1} + \frac{\theta(\sigma_M-\sigma_H)}{\sigma_M-1} \left(\frac{\beta + \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M}{\sigma_M-1}}{1 + \Xi \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \Xi \right\} \chi_H^l \hat{\tau}_R^l$$

$$+ \zeta \frac{\theta}{\sigma_M-1} \left(1 - (\sigma_M - \sigma_H) \left(\frac{\frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{1}{\sigma_M-1}}{1 + \Xi \left(\frac{\theta-\sigma_M+1}{\sigma_M-1} \right) \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \Xi \right) \hat{d}_R.$$

Finally, turning to the impact of RS on the sales of the MNE subsidiary, we get:

$$\widehat{R_R M_R} - \widehat{R_N M_N} = (1-\sigma_H) \frac{\beta + \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M}{\sigma_M-1}}{1 + \Xi \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \Xi \chi_H^l \hat{\tau}_R^l + \left(1 + \Xi \frac{\frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_H-1}{\sigma_M-1}}{1 + \Xi \frac{\theta-\sigma_M+1}{\sigma_M-1} \frac{\sigma_M-\sigma_H}{\sigma_M-1}} \right) \hat{d}_R.$$

Welfare computations We are interested in the change in welfare for workers of type t,

$$\hat{U}_H^t = \hat{X}_H^t - \hat{P}_H. \tag{A71}$$

The income of type t is given by:

$$X_H^t = \sum_{r=R,N} \left\{ \sum_{j=H,M,F} \tilde{w}_{H,r}^t L_{Hj,r}^t + \tilde{w}_{M,r}^t L_{M,r}^t \right\} + \sum_{j=H,M,F} (a_{Hj,N} - 1) \tilde{w}_{H,N}^t L_{Hj,N}^t + (a_{Hj,R} - 1) \tilde{w}_{H,R}^t L_{Hj,R}^t,$$

where $a_{H,N} = \frac{\theta\sigma_H}{\theta\sigma_H - (\sigma_H - 1)} = a_{F,N}$ and $a_{M,N} \equiv \frac{\theta\sigma_M}{\theta\sigma_M - (\sigma_M - 1)}$.

Log-differentiating this equation leads to:

$$\hat{X}_H^t = \Phi^t \left[\hat{w}_{H,N}^t + \phi_{H,R}^t \left(\hat{\tau}_R^t + \hat{T}_R \right) + \phi_M^t \hat{L}_M^t \right] \tag{A72}$$
$$+ \left(1 - \Phi^t \right) \left[\hat{w}_{H,N}^t + \sum_{j=H,F,M} \Psi_j \hat{L}_{Hj}^t + \Psi_{R2}^t \left(\hat{\tau}_R^t + \hat{T}_R \right) + \Psi_{HM,R} \hat{a}_{a_{M,R}} \frac{a_{M,N}}{a_{M,N} - 1} \right],$$

where Φ^t is the share of the labor income in the income of type t in the initial equilibrium:

$$\Phi^t \equiv \frac{\sum_{j=H,M,F} \chi_H^t X_{Hj}/a_j + \chi_M^t W_M L_M}{\sum_{j=H,M,F} \chi_H^t X_{Hj} + \chi_M^t W_M L_M},$$

$\phi_{H,R}^t$ is the share of total Home wage bill for type t corresponding to firms that will implement RS:

$$\phi_{H,R}^t \equiv \frac{\sum_{j=H,M,F} \gamma\phi_{Hj,R} X_{Hj}/a_i}{\sum_{j=H,M,F} X_{Hj}/a_j + \chi_M^t W L_M},$$

ϕ_M^t is the share of total Home wage bill for type t corresponding to MNE subsidiaries M:

$$\phi_M^t \equiv \frac{\chi_M^t W L_M}{\sum_{j=H,M,F} X_{Hj}/a_j + \chi_M^t W L_M},$$

Ψ_j is the share of total Home firm profits coming from each market j:

$$\Psi_j = \frac{\Pi_{Hj}^t}{\sum_{j=H,F,M} \Pi_{Hj}^t},$$

Ψ_j is the share of total Home firm profits corresponding to firms that will implement RS, that is:

$$\Psi_{R2}^t = \frac{\sum_{j=H,M,F} \Pi_{Hj,R}^t}{\sum_{j=H,F,M} \Pi_{Hj}^t},$$

and finally $\Psi_{HM,R}$ is the share of Home firm profits corresponding to sales to MNE subsidiaries that will implement RS:

$$\Psi_{HM,R} \equiv \frac{\gamma\Pi_{HM}}{\sum_{j=H,M,F} \Pi_{Hj}}.$$

These latter profits will be differentially affected since RS can be accompanied by a reduction in the supplier's markup, through the imperfect pass-through β of the policy. Specifically,

$$\hat{a}_{M,R} = (\beta - 1) \chi_H^l \hat{\tau}_R^l. \tag{A73}$$

Summing up over both worker types, the change in aggregate total income is:

$$\hat{X}_H = \sum_t \frac{X_H^t}{X_H} \hat{X}_H^t. \tag{A74}$$

Denote X_{ij} the expenditure of country $j = H, F$ on final goods produced by firms in country $i = H, F$ or final goods sold by MNEs' headquarters in Foreign when $i = M$. Let P_{ij} denote the corresponding price

index. Given the CES demand in equation (2), the changes in expenditure are given by:

$$\hat{X}_{ij} = (1 - \sigma_j)\left(\hat{P}_{ij} - \hat{P}_j\right) + \hat{X}_j \qquad \text{for } i, j = H, F, \tag{A75}$$

$$\hat{X}_{Mj} = \gamma \hat{d}_R + (1 - \sigma_j)\left(\hat{P}_{Mj} - \hat{P}_j\right) + \hat{X}_j \qquad \text{for } j = H, F, \tag{A76}$$

$$\hat{X}_{HM,r} = (1 - \sigma_M)\left(\hat{P}_{M,r} - \hat{R}_r\right) + \hat{R_r M_r} \qquad \text{for } r = N, R, \tag{A77}$$

$$\hat{R_r M_r} = \hat{d}_r + \sum_{j=H,F} \frac{X_{Mj}}{X_{MH} + X_{MF}}\left[(1 - \sigma_j)\left(\hat{R}_r - \hat{P}_j\right) + \hat{X}_j\right], \tag{A78}$$

$$\hat{Y}_M = \gamma \hat{R_R M_R} + (1 - \gamma)\hat{R_N M_N}. \tag{A79}$$

Price index changes are given by:

$$\hat{P}_j = \sum_{i=H,F,M} \lambda_{ij}\hat{P}_{ij} \qquad \text{for } i, j = H, F, \tag{A80}$$

$$\hat{P}_{ij} = \hat{W}_{i,N} + \gamma \phi_{ij} \chi_i^l \hat{\tau}_{i,T}^l + \frac{\theta - (\sigma_j - 1)}{\sigma_j - 1}\hat{z}_{ij} \qquad \text{for } i, j = H, F, \tag{A81}$$

$$\hat{P}_{HM,r} = \hat{W}_{i,N} + \beta \chi_H^l \hat{\tau}_{H,r}^l + \frac{\theta - (\sigma_j - 1)}{\sigma_j - 1}\hat{z}_{HM,r} \qquad \text{for } r = N, R, \tag{A82}$$

$$\hat{R}_r = \Xi \hat{P}_{HM,r} + (1 - \Xi)\hat{W}_{M,r} \qquad \text{for } r = N, R, \tag{A83}$$

$$\hat{P}_{Mj} = (1 - \gamma)\hat{R}_N + \gamma \hat{R}_R \qquad \text{for } j = H, F, \tag{A84}$$

where we have used the usual notation for trade shares, $\lambda_{ij} = \frac{X_{ij}}{X_j}$, while the threshold changes are:

$$\hat{z}_{ij} = \frac{\sigma_j}{\sigma_j - 1}\hat{W}_{i,N} - \hat{P}_j - \frac{1}{\sigma_j - 1}\hat{X}_j \text{ for } i = H; j = H, F, \tag{A85}$$

$$\hat{z}_{Fj} = 0, \tag{A86}$$

$$\hat{z}_{HM,r} = \frac{\sigma_M}{\sigma_M - 1}\hat{W}_{H,r} - \frac{\sigma_i - \sigma_f}{\sigma_i - 1}\hat{R}_r - \frac{1}{\sigma_M - 1}\hat{d}_r - \sum_{j=H,F} \frac{X_{Mj}}{X_{MH} + X_{MF}}\left[\hat{P}_j + \frac{1}{\sigma_M - 1}\hat{X}_j\right] \quad \text{for } r = N, R. \tag{A87}$$

Log-differentiating Foreign income and the trade balance yields:

$$\hat{X}_F = \frac{w_F L_F}{w_F L_F + \frac{1}{\sigma_H - 1}E_x}\hat{W}_F + \frac{\frac{1}{\sigma_H - 1}Y_M}{w_F L_F + \frac{1}{\sigma_H - 1}Y_M}\hat{Y}_M, \tag{A88}$$

$$\frac{X_{FH}}{X_{FH} + \frac{1}{\sigma_H}X_{MH}}\hat{X}_{FH} + \frac{\frac{1}{\sigma_H}X_{MH}}{X_{FH} + \frac{1}{\sigma_H}X_{MH}}\hat{X}_{MH} = \frac{\frac{\sigma_H - 1}{\sigma_H}X_{MF}}{X_{HF} + \frac{\sigma_H - 1}{\sigma_H}X_{MF}}\hat{X}_{MF} + \frac{X_{HF}}{X_{HF} + \frac{\sigma_H - 1}{\sigma_H}X_{MF}}\hat{X}_{HF}. \tag{A89}$$

Changes in labor allocations $\hat{L}_H^t$ and $\hat{L}_M^t$ needed in equation (A72) are given by noting that $\hat{L}_H^t = -\hat{L}_M^t \frac{L_M^t}{L_H^t}$ and using the MNE's change in labor demand, given the CES combination of high- and low-wage workers:

$$\hat{WL}_{M,r} = (1 - \sigma_M)\left(\hat{W}_{M,r} - \hat{W}_{H,r}\right) + \hat{X}_{M,r} \text{ for } r = R, N, \tag{A90}$$

$$\hat{wL}_{M,r}^t = (1 - \rho)\left(\hat{w}_H^t - \hat{W}_M\right) + \hat{WL}_{M,r} \text{ for } t = l, h; r = R, N, \tag{A91}$$

$$\hat{wL}_M^t = (1 - \rho)\left(\hat{w}_H^t - \hat{W}_M\right) + \gamma(1 - \sigma_M)\left(\hat{W}_M - \hat{W}_{H,R}\right) + (1 - \gamma)(1 - \sigma_M)\left(\hat{W}_M - \hat{W}_{H,N}\right) \quad \text{(A92)}$$
$$+ \gamma \hat{X}_{M,R} + (1 - \gamma)\hat{X}_{M,N} \text{ for } t = l, h; r = R, N,$$

so that overall:

$$\hat{L}_M^t = (1 - \gamma)\hat{wL}_{M,N}^t + \gamma \hat{wL}_{M,R}^t - \hat{w}_{H,N}^t \text{ for } t = l, h. \quad \text{(A93)}$$

Finally, log-differentiating the labor market clearing leads to:

$$\hat{w}_{H,N}^h - \hat{w}_{H,N}^l = \frac{\varphi_{H,R}\Phi_{labor}^h \hat{\tau}_{H,R} + \frac{1}{\rho}\left(1 - \tau_M^{-\rho}\right)\left(1 - \Phi_{labor}^h\right)\hat{L}_M^h}{1 - \left(1 - \tau_M^{-\rho}\right)\left(1 - \Phi_{labor}^h\right)}, \quad \text{(A94)}$$

where Φ_{labor}^t is the share of workers of type t hired by firms rather than by MNE subsidiaries:

$$\Phi_{labor}^t \equiv \frac{\sum_{j=H,M,F} X_{Hj}/a_j}{\sum_{j=H,M,F} X_{Hj}/a_j + \frac{\chi_M^t}{\chi_H^t}\frac{W_M L_M}{T_M}}.$$

The change in the welfare for Home workers of type t is given by the solution of the system of equations (A71)-(A94).

Appendix A.6.3   Robustness to MNEs also implementing RS at their subsidiaries

We consider here the alternative assumption on labor policies at the MNE subsidiary laid out in equation (7). Specifically, we assume that MNE subsidiaries offer the exact same labor conditions as their suppliers, that is, standard labor market conditions for MNEs without RS, and RS-labor conditions for MNEs that have implemented RS. That is:

$$\tau_{M,r}^t = \tau_{H,r}^t, \text{ for } t = \{l, h\}; r = \{N, R\}.$$

In this case, the first-order effect of a small RS policy $\left(\hat{\tau}_R^l, \hat{T}_R, \hat{d}_R\right)$ applied by a fraction γ of MNEs is different from the one computed in the baseline, as the policy also applies to workers directly employed by MNE subsidiaries. We report here the equations that differ from the welfare equations detailed in Appendix A.3. First, the change in wage indexes is now:

$$\hat{W}_{H,R} - \hat{W}_{H,N} = \chi_H^l \hat{\tau}_R^l, \quad \text{(A95)}$$
$$\hat{W}_{M,R} - \hat{W}_{M,N} = \chi_H^l \hat{\tau}_R^l. \quad \text{(A96)}$$

which replace equations (A44) and (A45).

Second, change in income for a representative worker of type t is:

$$\hat{X}_H^t = \Phi^t\left(\hat{w}_{H,N}^t + \tilde{\phi}_{H,R}^t\left(\hat{\tau}_R^t + \hat{T}_R\right)\right) + (1 - \Phi^t)\left[\hat{w}_{H,N}^t + \hat{L}_H^t + \varphi_{H,R}\left(\hat{\tau}_R^t + \hat{T}_R\right) + \varphi_{HM,R}\hat{a}\frac{a}{a-1}\right], \quad \text{(A97)}$$

instead of equation (A26), where Φ^t, $\varphi_{H,R}$ and $\varphi_{MH,R}$ are like in the baseline, but the share of total Home wage bill for type t corresponding to entities (suppliers and MNE subsidiaries) that will be subject to RS is now $\tilde{\phi}_{H,R}^t$, with

$$\tilde{\phi}_{H,R}^t \equiv \frac{\sum_{j=H,M,F} X_{Hj,R} + aWL_{M,R}}{\sum_{r=R,N}\left\{\sum_{j=H,M,F} X_{Hj,r} + aWL_{M,r}^t\right\}}.$$

Finally, log-differentiating the labor market clearing leads to:

$$\hat{w}_{H,N}^h - \hat{w}_{H,N}^l = \frac{\sum_{j=H,M,F} X_{Hj,R} + aWL_{M,R}}{\sum_{r=R,N} \left\{ \sum_{j=H,M,F} X_{Hj,r} + aWL_{M,r}^t \right\}} \hat{\tau}_R, \tag{A98}$$

which replaces equation (A50). The other equations in (A25)-(A50) are unchanged. Together with the substitutions above, these yield the change in welfare for Home workers of type t.

Appendix A.6.4   Model with multiple sourcing countries

We lay out here the case where the MNE sources from many countries indexed by $i \in \mathcal{I}$, among which Costa Rica (that is, $H \subset \mathcal{I}$). The MNE headquarters aggregates input from subsidiaries in a range of countries, with CES aggregator:

$$\mathcal{M} = \left(\sum_{i \in \mathcal{I}} M_i^{\frac{\alpha-1}{\alpha}} \right)^{\frac{\alpha}{\alpha-1}}. \tag{A99}$$

Its cost index is therefore:

$$P_M = \left(\sum_{i \in \mathcal{I}} \varrho_{iF}^{1-\alpha} R_i^{1-\alpha} \right)^{\frac{1}{1-\alpha}},$$

where ϱ_{iF} is the iceberg trade cost from i to F and R_i is the cost index of production in country i. Every country $i \in \mathcal{I}$ is modeled like the Home country of the main text. The RS policy is implemented everywhere, but we assume that it may be more or less easy to implement across countries. That is, countries may already be close (or not) to the standards imposed by RS. To that end, we allow $\tau_{i,R}^l$, the size of the RS cost shock, to be different for different countries $i \in \mathcal{I}$. Other RS characteristics (T_R, d_R, β) are symmetric across countries.

We now recompute the comparative statics for outcomes measured at Home under these assumptions, and compare them to the baseline case. On the final goods market, it is easy to see that the comparative statics remain unchanged, but they are now different on the MNE input market as this market is impacted by RS shocks happening in all sourcing countries. For simplicity of exposition (but without loss of generality for what we aim to establish here) we consider the case of the simplified model described in 2.4. That is, we assume that sourcing countries i do not trade with one another directly ($X_{iF} = X_{Mi} = 0, X_{ij} = 0$ for $i \neq j, \{i,j\} \in \mathcal{I}^2$), that MNEs only use local inputs but not local labor directly ($\Xi = 1$) and that extensive margin effects are turned off ($\sigma - 1 \to \theta$).

Following RS, an MNE of type $r = N, R$, sees its final good price change by:

$$\hat{P}_{M,r} = \sum_{i \in \mathcal{I}} s_i^o \hat{R}_{i,r}, \tag{A100}$$

where s_i^o is the share of MNE sourcing done in country i, $s_i^o = \frac{\varrho_{jF}^{1-\alpha} R_j^{1-\alpha}}{\sum_{j=1}^N \varrho_{jF}^{1-\alpha} R_j^{1-\alpha}}$. Similar to our derivation in the baseline, for an MNE of type r, input costs change in each sourcing country i according to:

$$\hat{p}_{iM,R} = \hat{R}_{i,r} = \hat{W}_{i,N} + \beta \chi_i^l \hat{\tau}_{i,r}^l,$$

where $\hat{\tau}_{i,N}^l = 0$ but $\hat{\tau}_{i,R}^l$ can be heterogeneous across countries. Suppliers in country i supply the MNE market and have corresponding sales:

$$y_{iM,r} = p_{iM,r}^{1-\sigma} N_r R_{i,r}^\sigma M_{i,r},$$

where total MNE production in sourcing country i is given by:

$$R_{i,r}M_{i,r} = \left(\frac{\varrho_{iF}R_{i,r}}{P_{M,r}}\right)^{1-\alpha} P_{M,r}^{1-\sigma} d_r D_M, \tag{A101}$$

where D_M is a demand shifter measuring demand for the final good produced by the MNE worldwide ($D_i = \sum_j \varrho_{Fj} X_j P_j^{\sigma-1}$). Combining equations (A100) and (A101), the relative change in the sales of suppliers and MNE subsidiary at Home, relative to those not impacted by RS, are:

$$\hat{y}_{HM,R} - \hat{y}_{HM,N} = (1-\alpha)\beta\chi_H^l\hat{\tau}_{H,R}^l + (\alpha-\sigma)\left(\sum_{j\in\mathcal{I}} s_j^o\beta\chi_j^l\hat{\tau}_{j,R}^l\right) + \hat{d}_R,$$

$$\hat{RM}_{H,R} - \hat{RM}_{H,N} = (1-\alpha)\beta\chi_H^l\hat{\tau}_{H,R}^l + (\alpha-\sigma)\left(\sum_{j\in\mathcal{I}} s_j^o\beta\chi_j^l\hat{\tau}_{j,R}^l\right) + \hat{d}_R,$$

while in the baseline case, we had:

$$\hat{y}_{HM,R} - \hat{y}_{HM,N} = (1-\alpha)\beta\chi_H^l\hat{\tau}_{H,R}^l + \hat{d}_R,$$
$$\hat{RM}_{H,R} - \hat{RM}_{H,N} = (1-\alpha)\beta\chi_H^l\hat{\tau}_{H,R}^l + \hat{d}_R.$$

Comparing the two comparative statics, we see, first, that if $\alpha = \sigma$, then the two models yield exactly the same comparative statics. Second, assume now that $\alpha \neq \sigma$, and that a researcher were to apply the empirical strategy we follow in the paper coming from a model where CR is the only sourcing country when the real data generating process has multiple sourcing countries. That is, we assume that from the event study on sales, the researcher backs out a residual "demand shock" $\hat{D}_R$ from the empirical strategy we follow in the paper:

$$\hat{D}_R \equiv \hat{y}_{iM,R} - \hat{y}_{iM,N} - (1-\sigma)\beta\chi_i^l\hat{\tau}_{i,R}^l. \tag{A102}$$

Under the multi-country model, what this shifter captures is in fact:

$$\hat{D}_R = (\alpha-\sigma)\left(\sum_{j\in\mathcal{I}} s_j^o\beta\chi_j^l\hat{\tau}_{j,R}^l - \beta\chi_H^l\hat{\tau}_{H,R}^l\right) + \hat{d}_R. \tag{A103}$$

In this model with multiple sourcing countries, the residual shock $\hat{D}_R$ captures both the true RS demand shock $\hat{d}_R$, as well as the fact that the MNE reallocates production between sourcing countries when RS is differently costly across countries. This is captured by the reallocation term $\sum_{J\in\mathcal{I}} s_j^o\beta\chi_j^l\hat{\tau}_{j,R}^l - \beta\chi_H^l\hat{\tau}_{H,R}^l$ that measures the relative cost change in Home compared to the average sourcing country. Note first that if RS is not heterogeneous across countries, that term is equal to zero and the strategy of the baseline model correctly identifies $\hat{D}_R = \hat{d}_R$. Second, if RS has heterogeneous costs across countries, the reallocation term is not 0. To gauge whether the effect of RS is likely very heterogeneous between Home (CR) and other countries on average in our context, we turn to the MNE-level event study. First, return to the equation defining the share of MNE costs coming from MNE subsidiary i (equation (A101)) and define the share of inputs sourced in country i as $s_{i,r} = \frac{R_{i,r}M_{i,r}}{\sum_j R_{j,r}M_{j,r}} = \left(\frac{\varrho_{iF}R_{i,r}}{P_{M,r}}\right)^{1-\alpha}$. Then, after the RS shock, for an RS-MNE compared to a baseline non-RS-MNE subsidiary at Home, we have:

$$\hat{s}_{H,R} - \hat{s}_{H,N} = (1-\alpha)\left(\beta\chi_H^l\hat{\tau}_{H,R}^l - \sum_{j\in\mathcal{I}} s_j^o\beta_j\chi_j^l\hat{\tau}_{j,R}^l\right).$$

Recall that in our empirical results, we find that this regression estimates a statistical 0 (see Panel B of Figure B4): we do not find evidence that the RS-event affects subsidiary sales in CR differently from MNE-level sales in the Orbis data. This indicates that, on average (across the RS rollouts we consider in our sample), CR is not more or less affected than other source countries by the RS shock. Overall, this suggests that CR is close to the average country in terms of how binding RS is, i.e., there is no reallocation in or out of CR due to a particularly strong or weak RS policy in CR compared to the other sourcing countries. In this context, we can now come back to the estimation of the demand shock. Given that $(1-\alpha)\left(\beta\chi_H^l\hat{\tau}_{H,R}^l - \sum_{j\in\mathcal{I}}s_j^o\beta_j\chi_j^l\hat{\tau}_{j,R}^l\right) = 0$, we find that running (A102) to estimate the demand shock $\hat{d}_R$ is valid (see equation (A103)) and recovers:

$$\hat{D}_R = \hat{d}_R,$$

just like in the baseline model. To complete this discussion (including for contexts in which this margin may feature more strongly), we move on to the welfare equations to evaluate the corresponding welfare consequences in this extended model with multiple sourcing countries.

Welfare We compute the welfare effects of all MNEs implementing RS in all of their sourcing countries, extending the simplified baseline of 2.4 to a multi-country setting. The expression for the change in income and price index, and therefore, the aggregate welfare in Home is unchanged:

$$\hat{U_H} = (1-\lambda_{HH})\hat{W}_{H,N} + \beta\lambda_{FH}\chi_H^l\hat{\tau}_{H,R}^l + (\Lambda\lambda_{HH} + \lambda_{FH})\hat{T}_R.$$

What changes compared to the baseline model is the trade balance expression that pins down the Home wage index. Given the simple trade patterns we assume, we have:

$$\hat{\lambda}_{FH} + \hat{X}_H = \hat{\lambda}_{M_H F},$$

where the expression for changes in expenditures $\hat{\lambda}_{FH}$ is unchanged and, using equations (A99) and (A101), the total exports from H to F are given by:

$$X_{M_H F} = \frac{\varrho_{HF}^{1-\alpha}R_H^{1-\alpha}}{P_M^{1-\alpha}}\frac{P_M^{1-\sigma}}{P_F^{1-\sigma}}d_M X_F,$$

so that in changes after a RS shock:

$$\hat{\lambda}_{M_H F} = (1-\sigma)\left(\hat{W}_{H,N} + \beta\chi_H^l\hat{\tau}_{H,R}^l\right) - (1-\sigma)\hat{P}_F + \hat{d}_R - (\sigma-\alpha)\underbrace{\left(\sum_{i\in\mathcal{I}}s_i^o\beta\chi_i^l\hat{\tau}_{i,R}^l - \beta\chi_H^l\hat{\tau}_{H,R}^l\right)}_{=\hat{D}_R} \quad \text{(A104)}$$
$$- (\sigma-\alpha)\left(\sum_{i\in\mathcal{I}}s_i^o\hat{W}_{i,N} - \hat{W}_{H,N}\right).$$

Using that $\hat{D}_R = \hat{d}_R$ in our empirical context, we get:

$$\hat{\lambda}_{M_H F} = (1-\sigma)\left(\hat{W}_{H,N} + \beta\chi_H^l\hat{\tau}_{H,R}^l\right) - (1-\sigma)\hat{P}_F + \hat{d}_R - (\sigma-\alpha)\left(\sum_{i\in\mathcal{I}}s_i^o\hat{W}_{i,N} - \hat{W}_{H,N}\right), \quad \text{(A105)}$$

while in the baseline case we had:

$$\hat{\lambda}_{M_H F} = (1-\sigma)\left(\hat{W}_{H,N} + \beta\chi_H^l\hat{\tau}_{H,R}^l\right) - (1-\sigma)\hat{P}_F + \hat{d}_R. \quad \text{(A106)}$$

Comparing equations (A105) and (A106), after assuming that $(\sigma - \alpha)\left(\sum_{i \in \mathcal{I}} s_i^o \hat{W}_{i,N} - \hat{W}_{H,N}\right) \sim 0$,[v] the two models (single-sourcing-country and multiple-sourcing-countries) lead to the same welfare expressions for Home in our empirical context, and the baseline approach correctly backs out the welfare effect of RS, even in a multi-country setting.

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[v]$(\sigma - \alpha)\left(\sum_{i \in \mathcal{I}} s_i^o \hat{W}_{i,N} - \hat{W}_{H,N}\right) \sim 0$ implies that the cross-country reallocation we can observe due to a given RS rollout by an MNE also holds in GE. That is, if we do not observe cross-country reallocation by MNEs due to their own RS rollouts, then the assumption is that those same MNEs also do not reallocate due to broader GE effects of RS.

Appendix B   Additional figures and tables

Appendix B.1   Additional supplier-level figures

Figure B1: Supplier-Level Total Sales Effect of Exposure to MNE RS Rollouts by Supplier Type
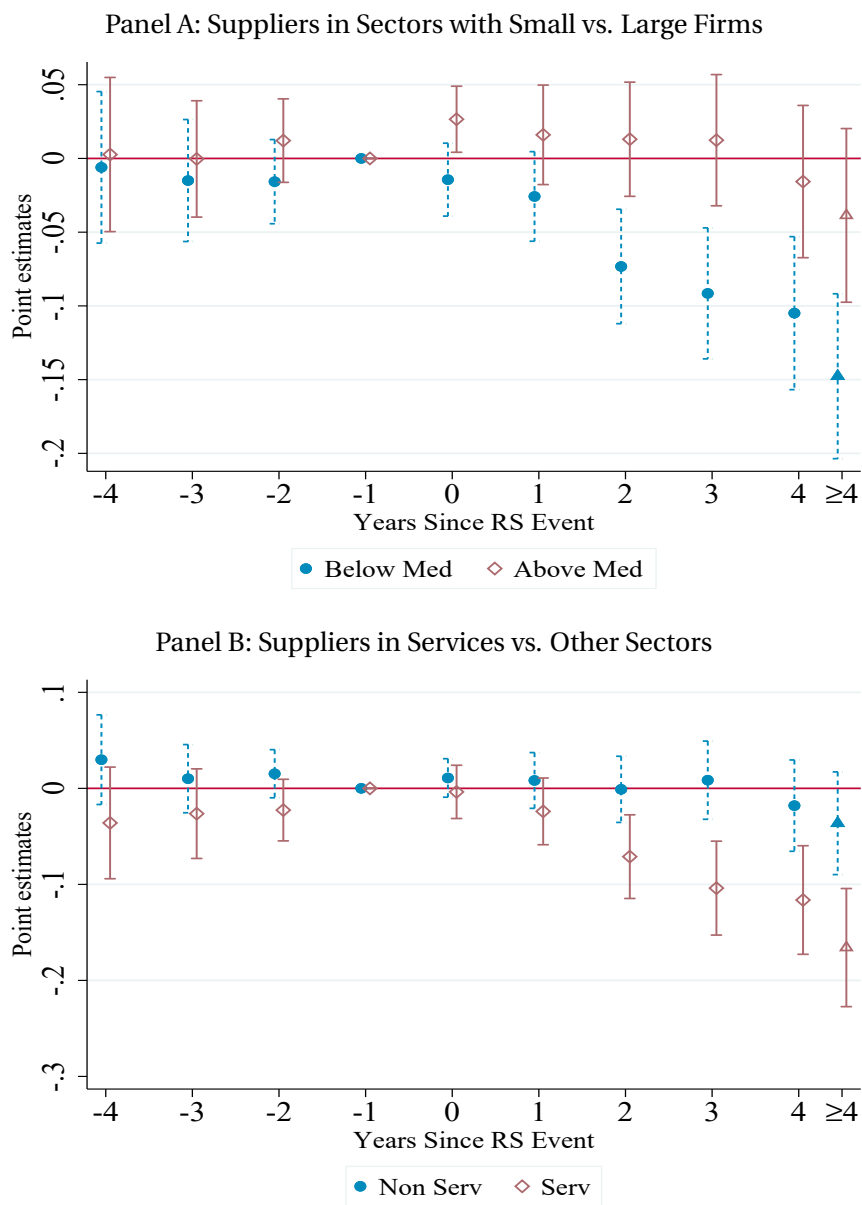
Panel A: Suppliers in Sectors with Small vs. Large Firms

Panel B: Suppliers in Services vs. Other Sectors

Notes: This figure plots estimates from the IV event-study specification in column 4 of Panel A in Table 2 after including additional interactions of the event timeline dummies with supplier type dummies. In Panel A, suppliers are separated by whether the average firm size in their sector is above or below the median across sectors. In Panel B, suppliers are divided based on whether they operate in a service sector or not. 95 percent confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure B2: Supplier-Level Total Sales Effect by Characteristics of the MNE Headquarters Country
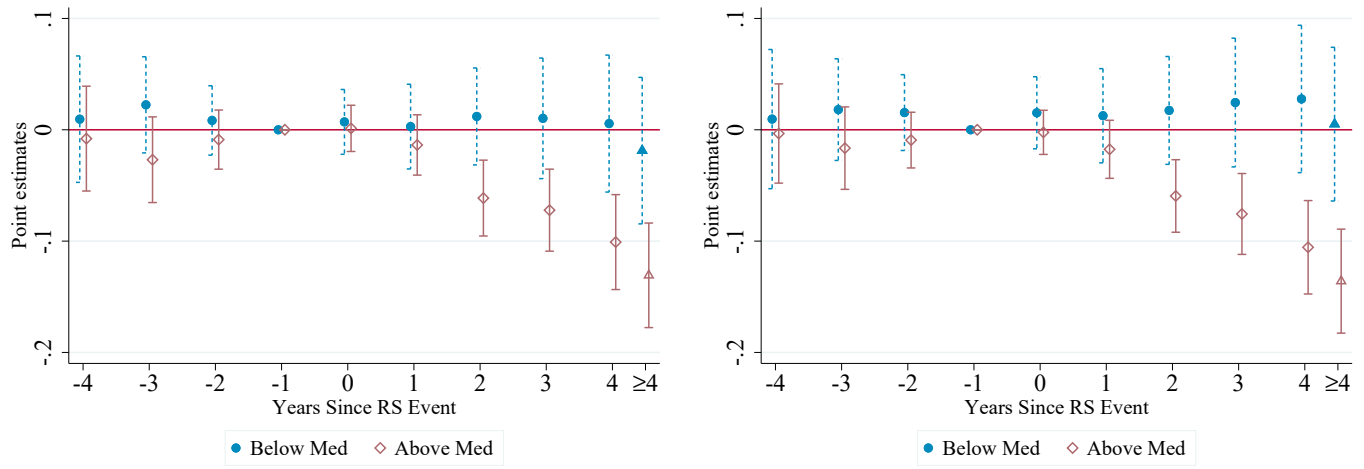
(A) MNE HQ Country Above/Below Median No. of Labor Inspectors per 10.000 Employees

(B) MNE HQ Country Above/Below Median Index of Strictness of Employment Protection

(C) MNE HQ Country Above/Below Median Management Score

Notes: This figure plots estimates from the IV event-study specification in column 4 of Panel A in Table 2 after including additional interactions of the event timeline dummies with RS-MNE type dummies. The outcome in all panels is the log of total annual firm sales. Panel A splits observations depending on whether the number of labor inspectors per 10,000 workers in the MNE HQ country is above or below the median of the set of MNE HQ countries (source: ILO). The number of labor inspectors per 10,000 workers is suggestive of the resources available for monitoring and enforcing appropriate work conditions and the c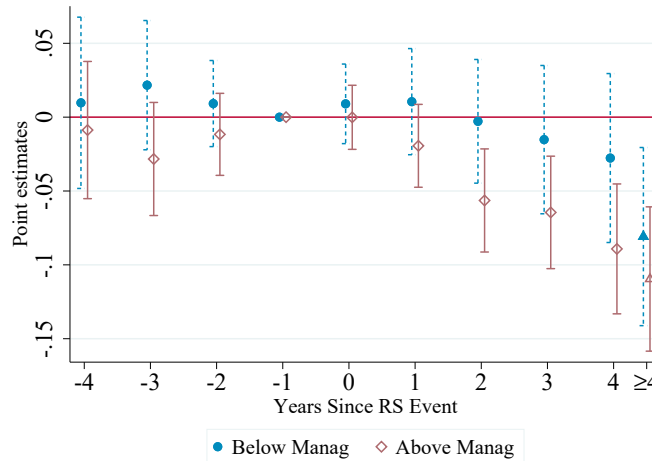orresponding standards. Panel B splits observations depending on whether the OECD's index of strictness of employment protection for the MNE HQ country is above or below the median of the set of MNE HQ countries (source: OECD). This index ranges between 0 and 6, where a higher value means a higher regulatory protection. Panel C splits observations based on whether the MNE HQ country management score is above or below the median of the set of MNE HQ countries. The country-level management score is taken from Bloom et al. (2021). 95 percent confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure B3: Supplier-Level Effects of Exposure to RS on the Number of Months of Maternity Leave
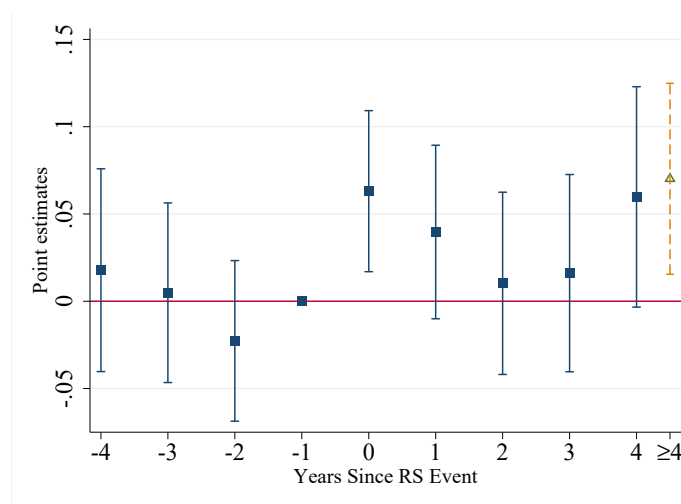
Notes: This figure plots IV event-study estimates where the outcome is the number of months of maternity leave granted to women who took a maternity leave. The regression corresponds to the supplier-level specification in equation (19). 95 percent confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Appendix B.2   Additional MNE-level figures

Figure B4: Effect of RS Rollouts on MNE Subsidiary Sales in CR and Relative Size in MNE Group
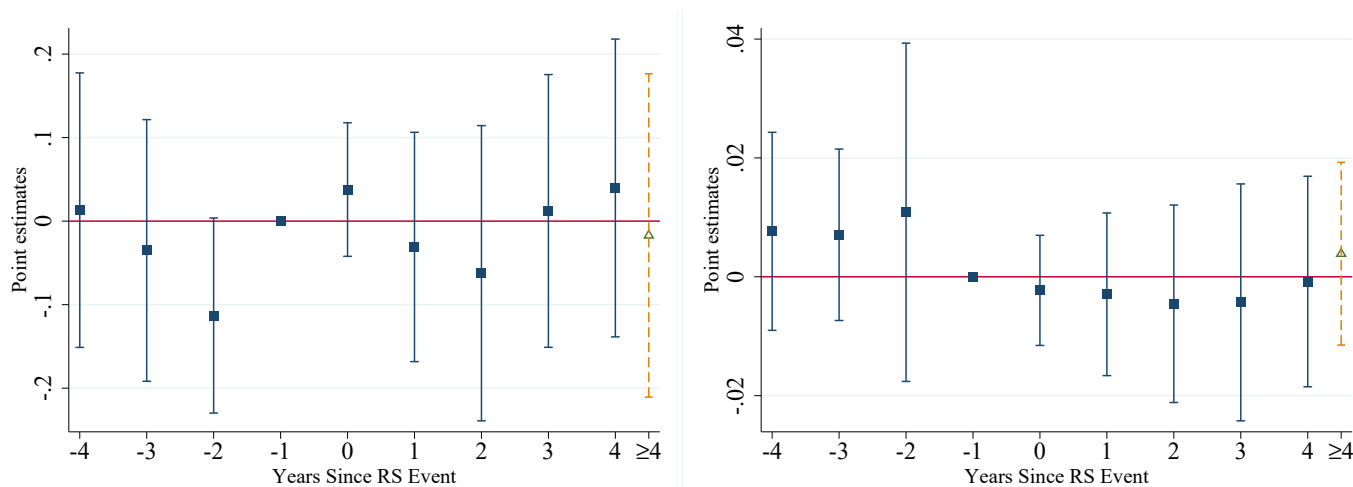
(A) Total Sales of MNE Subsidiary in CR   (B) Ratio of MNE Sales in CR vs. Worldwide

Notes: This figure plots the IV estimates from columns 3 and 6 in Appendix Table B8. Both sets of estimates come from the MNE-level version of the specification in equation (19). In Panel A, the outcome is the log of the sales of the MNE subsidiary in CR. In Panel B, the outcome is the fraction of CR subsidiary sales in the global sales of the MNE. 95 percent confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure B5: Effect of RS Rollouts on New Entry to Supplying RS-MNE
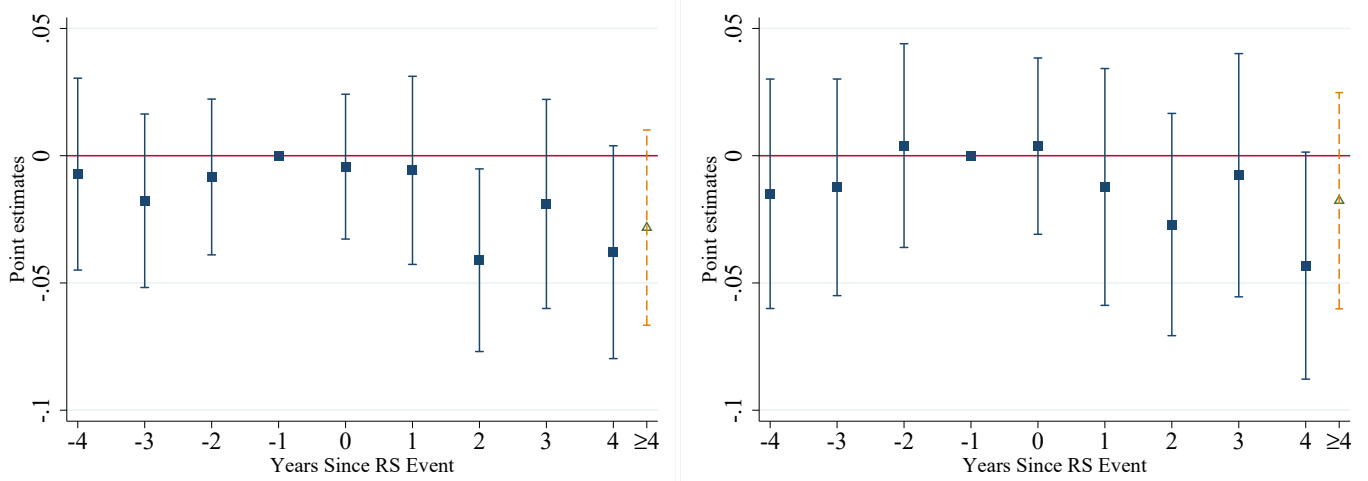
(A) Share of New Suppliers among All Suppliers of an MNE

(B) Share of MNE Purchases from New Suppliers
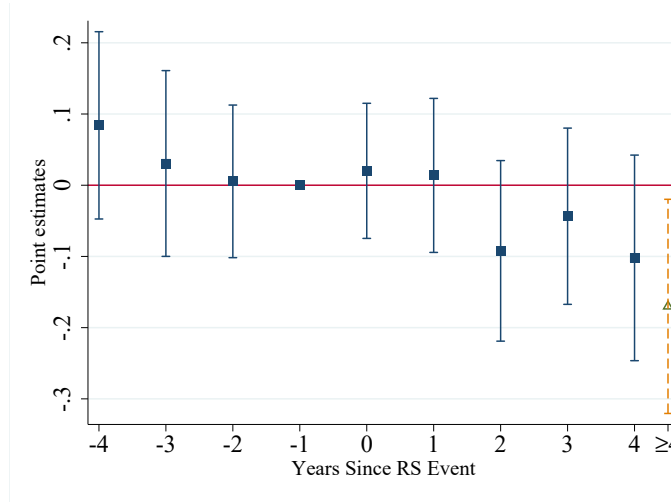
(C) Log (1+ Number of New Suppliers of an MNE)

Notes: All three panels plot event-study estimates coming from the MNE-level version of the specification in equation (19). In all three panels, we define a domestic firm as a new supplier to a given MNE if it has not supplied to the MNE in any previous year. In Panel A, the outcome is the share of the number of new suppliers in the MNE's total number of suppliers. In Panel B, the outcome is the share of purchases from new suppliers. In Panel C, the outcome is the log(1+ number of new suppliers) of the MNE. 95 percent confidence intervals are based on standard errors clustered at the firm level. See Section 4 for discussion.

Figure B6: Firm Splitting After Exposure to RS Policies
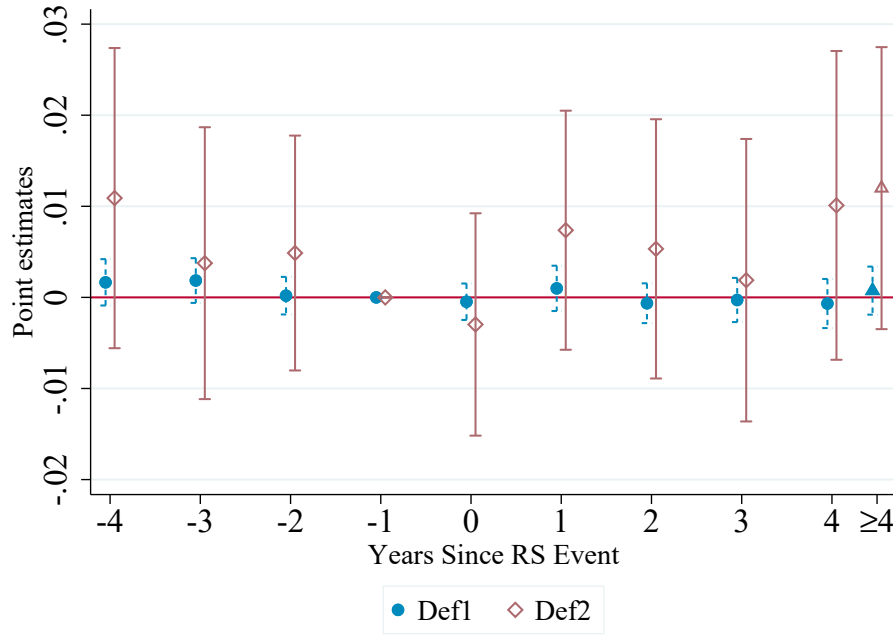
Notes: We ask whether some of the negative effects on exposed supplier sales and employment could be driven by suppliers "splitting up"—from a previous firm into several entities (tax IDs). Under this scenario, either the old or new entity could specialize in supplying to the RS-MNE, avoiding costly compliance on the rest of their production. To assess this possibility, we use the matched employer-employee database to investigate whether the propensity for linked worker movements to new firms increases as a function of being exposed to RS codes of conduct. We estimate the same supplier-level event-study specification (19).

On the left-hand side, we use two alternative measures of "firm splitting". The first (Def1) is an outsourcing measure in the spirit of Goldschmidt and Schmieder (2017). The outcome is an indicator equal to 1 if there is a flow of workers from one tax ID to another satisfying 4 conditions: (i) the linked movement of workers is ≥ 0.3 of the initial firm's employment in year $t-1$; (ii) either the new employer is a new firm (new tax ID), or the inflow is $\geq .66$ of the receiving firm's employment in year t; (iii) the number of workers at the initial firm in year $t-1$ is at least 5; and (iv) the receiving firm operates in the same industry.

The outcome variable in the second definition (Def2) is: $X_{i,t} = \max_{j \neq i} \frac{w_{i,t}^{j,t+1}}{\sum_{j \neq i} w_{i,t}^{j,t+1}}$, where $w_{i,t}^{j,t+1}$ is the number of workers that move from firm i in year t to firm j in year $t+1$. We only consider workers that move to another firm (not the ones that continue in the same firm or are unemployed) in year $t+1$. Hence, this variable measures how large (relative to the total outflow of workers from firm i) the biggest group of workers is that move together to a new firm (with a value of 1 at the max). For either definition, we find no evidence that supplier exposure to RS rollouts increases the likelihood of firm splitting. 95 percent confidence intervals are based on standard errors clustered at the firm level.

Figure B7: Does RS Follow Negative Campaigns or Leadership Changes?
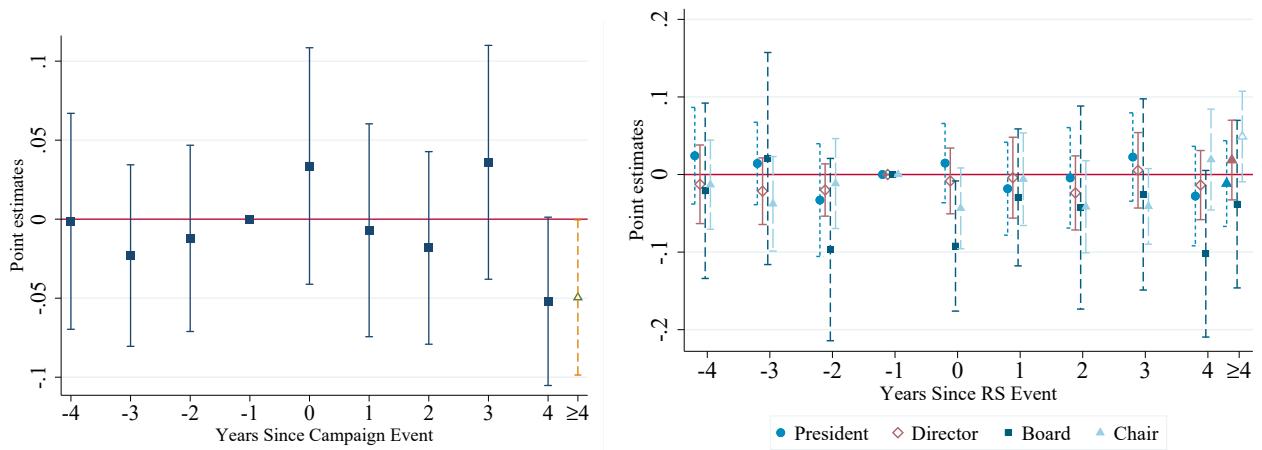
(A) Effects of Negative Campaigns on RS Probability

(B) Effects of RS Timeline on the Probability of Changing a Key Employee

Notes: We investigate whether RS rollout decisions are on average more likely to happen after significant negative news events related to production practices or after changes in the MNE leadership. Even though the timeline of event-study estimates in Figure B4 above does not suggest significant pre-trends for MNE-level outcomes, it could be the case that RS rollouts coincide with negative demand shocks (driven by adverse media coverage) or changes in key employee positions at the MNE level.

In Panel A, we make use of the Sigwatch database described in Section 3, providing a comprehensive coverage of NGO-led campaigns against MNE production practices. We assess whether or not negative NGO campaigns about production practices increase the likelihood that RS codes of conduct are being rolled out. We implement MNE-level event studies with NGO campaigns in the event timeline on the right-hand side and a dummy for RS rollouts on the left, including MNE and sector-by-year fixed effects. We find no evidence that the likelihood of RS rollouts increases after negative consumer-facing NGO campaigns.

In Panel B, we use the BoardEx and Orbis data described in Section 3, tracking leadership changes at the MNE level. These data provide the starting and ending date of the employment of workers in key positions at each MNE. Since job title classifications differ across MNEs, we focus on changes in leadership positions whose job titles either include the words "president", "board", "chair" or "director" (including "MD" for managing director). In the same specification as for Panel A (with RS rollouts on the left and the event timeline for leadership changes on the right), We find no evidence that the likelihood of RS rollouts increases due to leadership changes in either of the 4 employee categories. 95 percent confidence intervals are based on standard errors clustered at the firm level.

Appendix B.3   Additional descriptive statistics

Table B1: MNE Sample Coverage

Total Sales	85.2%
Number of Workers	85.6%
Wage Bill	86.8%
Exports	94.7%
Imports	86.8%
Value Added	88.6%
Domestic Purchases	80.0%
Total Net Assets	86.3%

Notes: Table presents the coverage for the period 2008 to 2019 (summing across all years) of the total values for the 481 MNEs in our sample out of the total values for the full sample of 2,156 firms that are part of a corporate group with partial foreign ownership (across eight variables).

Table B2: Sample of RS Rollouts Between 2009 and 2019 by 481 MNEs with Subsidiaries in CR

Year	MNE	Year	MNE	Year	MNE	Year	MNE
2009	Astrazeneca	2011	G4S	2014	Avianca	2016	Sigma Alimentos
2009	Eaton Electrical	2011	Huawei Technologies	2014	BA Continuum	2016	Volcafe
2009	Enel Green Power	2011	Kimberly Clark	2014	BATO Shared Services	2017	Bridgestone
2009	ERIAL	2011	Maersk	2014	Boston Scientific	2017	Brightpoint Group
2009	Ericsson	2011	McCann Advertising	2014	Bridgestone	2017	Cemaco
2009	F. Hoffmann-La Roche AG	2011	Philip Morris	2014	Davivienda	2017	Concentrix
2009	Florida Ice and Farm	2011	Puratos Group	2014	Del Monte Agricola	2017	Constructora Los Negros
2009	Granja Avicola Ricura	2011	Toyota	2014	Del Monte Frozen Products	2017	Enel Green Power
2009	Intel	2012	American & Efird LLC	2014	Greif, Inc	2017	FHACASA
2009	Oracle	2012	Bimbo	2014	Intel	2017	Florida Ice and Farm
2009	Praixar	2012	BTicino S.p.A	2014	Microsoft	2017	Holcim
2009	Toyota	2012	C&K Components, Inc	2014	Securitas	2017	Nutresa
2009	UPS	2012	Camino Real Hotels	2014	Unilever	2017	Panduit
2010	Accenture	2012	Cemex	2015	Astrazeneca	2017	Philip Morris
2010	BASF SE	2012	Claro Company	2015	Bekaert	2017	POPS Ice Creams
2010	Bayer Medical	2012	Ericsson	2015	Cargill	2017	Radisson Hotels
2010	British American Tobacco	2012	Havells Sylvania	2015	Credomatic	2017	Ristic AG
2010	Citi Business Services	2012	McDonalds	2015	CWT Company	2017	Smurfit Kappa
2010	Citibank	2012	Mexichem Orbia	2015	Emerson Electric	2017	Sonepar Company
2010	Clorox de Centroamerica	2012	Microsoft	2015	Griffith Foods International	2017	The Bank of Nova Scotia
2010	Desatur Corobici	2012	Nutresa	2015	Grupo Aval	2017	Zevex INC
2010	El Gallito Industrial	2012	Pfizer	2015	Kuehne + Nagel	2017	Zollner Electronic
2010	Embotelladora Centroamericana	2012	POPS Ice Creams	2015	Millicom	2018	Astrazeneca
2010	Expeditors International	2012	Samtec Inc	2015	Optica Industrial	2018	BATO Shared Services
2010	Fertilizers Pacific	2012	The Westin - Marriott Int	2015	Productos Florida	2018	Bridgestone
2010	Florida Bebidas	2013	Allergan	2015	Reca Quimica	2018	Cemex
2010	Florida Ice and Farm	2013	Arcelormittal	2015	Vmware	2018	Fujitsu Global
2010	Glaxosmithkline	2013	Coca Cola	2015	Volcafe	2018	Itinera S.p.A
2010	Leo Burnett Worldwide, Inc.	2013	Coca Cola Service Center	2015	Yamaha	2018	Mckinsey & Company
2010	Paradise Ingredients	2013	Dole plc	2016	3M	2018	Medplast Medical
2010	Productora la Florida	2013	Holcim	2016	Aluma Systems	2018	The Crowley Company
2010	Prosix Engineering	2013	ICA Construction	2016	American Airlines	2018	Vertiv
2010	Ristic AG	2013	Intel	2016	Baltimore Spice Company	2019	Amazon
2010	Smurfit Kappa	2013	Medtronic	2016	BATO Shared Services	2019	Davivienda
2010	Unilever	2013	Novartis	2016	Bridgestone	2019	Heinz
2011	Amway	2013	Qorvo	2016	British American Tobacco	2019	IGT Global Solutions
2011	Bourns, Inc	2013	Swissport	2016	Burger King	2019	Microvention
2011	Bridgestone	2013	Sykes Enterprises	2016	Claro Company	2019	R.R. Donnelley
2011	Colgate-Palmolive Company	2013	Telefonica	2016	Felguera IHI	2019	UPL Limited
2011	Enel Green Power	2013	The Procter & Gamble Company	2016	Havells Sylvania		
2011	Ernst & Young	2013	Wyndham Hotels & Resorts	2016	Panasonic		
2011	Essity AB	2014	Alpla Group	2016	Productores Monteverde		

Notes: Table presents the list of RS rollouts between 2009 and 2019 by the 481 MNEs with subsidiaries in CR in our estimation sample. We focus on rollouts related to working conditions. (This information is based on public records, without disclosure of any confidential information.) To construct these data, we implemented a double-blind search process by two independent research teams whose output we then cross-checked and combined into one final database. For each MNE, we searched all publicly-available company reports, press releases, corporate filings, and publications available online, including company websites of the CR subsidiaries and the MNE groups, containing information about corporate social responsibility, responsible sourcing practices and supplier codes of conduct. In addition, for each MNE, we also conducted online searches in both local CR and international media outlets.

Table B3: Descriptive Statistics for the Sample of MNEs

	# Firms	Mean	S.D.	Median
A. MNEs not implementing an RS policy				
Total Sales	346	52839.0	148191.4	19193.2
Employment	346	470.2	993.3	201.6
Wage Bill	346	5881.3	12053.6	2788.0
Exports	273	15993.7	41295.8	1458.0
Imports	339	12565.3	26850.7	2095.2
Value Added	346	12437.6	28444.9	5030.9
Domestic Purchases	346	66.5	113.4	35.6
Total Net Assets	345	59516.7	121826.7	19203.1
Firms in Manuf. Sectors	346	31.8	46.6	0.0
Firms in Agric. Sectors	346	6.4	24.4	0.0
Firms in Ret. & Wholes. Sectors	346	16.5	37.1	0.0
Firms in Serv. Sectors	346	45.4	49.9	0.0
Firms with HQ in USA	346	28.0	45.0	0.0
Firms with HQ in Europe	346	18.2	38.6	0.0
B. MNEs implementing an RS policy				
Total Sales	135	95347.8	164168.8	42198.5
Employment	135	698.7	1506.2	300.2
Wage Bill	135	11823.7	17655.0	5621.7
Exports	123	38373.8	137648.4	2419.2
Imports	135	32911.8	118798.8	5948.3
Value Added	135	38546.0	98811.1	13012.8
Domestic Purchases	135	87.1	104.9	51.2
Total Net Assets	135	162894.2	502242.1	37030.8
Firms in Manuf. Sectors	135	37.0	48.5	0.0
Firms in Agric. Sectors	135	1.5	12.1	0.0
Firms in Ret. & Wholes. Sectors	135	15.6	36.4	0.0
Firms in Serv. Sectors	135	45.9	50.0	0.0
Firms with HQ in USA	135	39.3	49.0	0.0
Firms with HQ in Europe	135	24.4	43.1	0.0

Notes: Table presents descriptive statistics for: (A) the sample of MNEs that do not implement an RS policy and (B) the sample of MNEs that implemented an RS policy between 2009 and 2019. With the exception of the number of workers, the mean, standard deviation, and median are in thousands of CPI-deflated 2013 US dollars. These statistics are averages across 2008 to 2019.

Table B4: Descriptive Statistics for Exposed and Non-Exposed Domestic Suppliers

	Non-exposed suppliers	Exposed suppliers	Difference
	(1)	(2)	(3)
Time Invariant Characteristics			
Agriculture, Forestry and Fishing	9.221	4.546	4.675***
	(28.93)	(20.83)	(0.46)
Manufacturing	10.77	13.92	-3.156***
	(31.00)	(34.62)	(0.53)
Electricity and Gas	0.148	0.154	-0.00581
	(3.84)	(3.92)	(0.06)
Sewerage and Waste Management	0.801	0.769	0.0326
	(8.92)	(8.73)	(0.15)
Construction	7.551	3.404	4.147***
	(26.42)	(18.14)	(0.42)
Wholesale and Retail Trade	26.60	29.06	-2.454**
	(44.19)	(45.41)	(0.75)
Transportation and Storage	8.432	10.04	-1.605***
	(27.79)	(30.05)	(0.47)
Accommodation and Food Services	5.733	3.514	2.218***
	(23.25)	(18.42)	(0.37)
Information and Communication	2.484	4.810	-2.326***
	(15.56)	(21.40)	(0.29)
Real Estate	2.521	2.943	-0.422
	(15.68)	(16.90)	(0.27)
Professional, Scientific and Technical	12.00	14.50	-2.494***
	(32.50)	(35.21)	(0.56)
Administrative and Support Service	6.774	6.962	-0.188
	(25.13)	(25.45)	(0.42)
Education	0.561	0.483	0.0777
	(7.47)	(6.94)	(0.12)
Human Health and Social Work	1.837	1.230	0.607**
	(13.43)	(11.02)	(0.22)
Art, Entertainment and Recreation	1.097	1.142	-0.0449
	(10.42)	(10.63)	(0.18)
Other Services	3.008	2.240	0.768**
	(17.08)	(14.80)	(0.28)
Mining and Quarrying	0.456	0.286	0.171
	(6.74)	(5.34)	(0.11)
Time Variant Characteristics			
Total Sales (thous. U.S. dollars)	1276.1	3010.9	-1734.8***
	(4960.31)	(13688.54)	(82.86)
Number of Workers	16.16	32.34	-16.18***
	(47.63)	(108.85)	(0.77)
Total Sales (thous. U.S. dollars) / Worker	118.5	145.7	-27.18***
	(445.59)	(526.56)	(6.77)
Wage Bill per Worker	7.095	8.173	-1.078***
	(7.03)	(6.24)	(0.11)
Share of Importers	24.90	41.01	-16.10***
	(43.24)	(49.19)	(0.66)
Share of Exporters	6.920	14.45	-7.532***
	(25.38)	(35.17)	(0.39)
Number of Firms	16223	4553	

Notes: Table presents descriptive statistics for the sample of suppliers that experience an RS-policy event during our sample period (2009-19) from an MNE buyer (column 2) and other suppliers to MNEs that do not experience an RS-policy event (column 1). All time-varying variables correspond to averages across time for each supplier. In the case of column 2, we only use the year before the RS exposure event to compute the averages. Standard deviations in parentheses.

Appendix B.4 Additional event-study tables

Table B5: Worker-Level Effects of Exposure to MNE RS Rollouts on Labor Earnings

Panel A: All Workers

	(1)	(2)	(3)	(4)
	TWFE	TWFE	SA	IV
$\eta = -4$	-0.007***	-0.003	0.005**	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)
$\eta = -3$	-0.006***	-0.005***	0.002	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
$\eta = -2$	-0.001	-0.000	0.003***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
$\eta = -1$	0	0	0	0
	(0)	(0)	(0)	(0)
$\eta = 0$	0.002**	-0.000	-0.003***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
$\eta = 1$	0.006***	0.002	-0.002	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
$\eta = 2$	0.010***	0.004***	-0.000	0.006***
	(0.001)	(0.001)	(0.002)	(0.002)
$\eta = 3$	0.012***	0.006***	0.001	0.009***
	(0.002)	(0.002)	(0.002)	(0.002)
$\eta = 4$	0.017***	0.011***	0.006***	0.015***
	(0.002)	(0.002)	(0.002)	(0.002)
$\eta \geq 4$	0.015***	0.011***	0.001	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)
Year-Sect FE	Yes	Yes	Yes	Yes
Worker-Firm FE	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Adjusted R^2	0.84	0.84	0.84	–
# Observations	4974613	4974613	4974613	4974613
# Firms	67023	67023	67023	67023
# Workers	768114	768114	768114	768114

Panel B: Heterogeneity by Initial Worker Earnings

	(1)	(2)	(3)
	Bottom 25	Middle 25-50	Top 25
$\eta = -4$	-0.001	-0.003	0.000
	(0.007)	(0.002)	(0.004)
$\eta = -3$	-0.008	-0.007***	-0.003
	(0.006)	(0.002)	(0.003)
$\eta = -2$	0.004	-0.003**	-0.003
	(0.004)	(0.001)	(0.002)
$\eta = -1$	0	0	0
	(0)	(0)	(0)
$\eta = 0$	0.008*	0.002	-0.001
	(0.004)	(0.001)	(0.002)
$\eta = 1$	0.019***	0.005***	0.001
	(0.005)	(0.002)	(0.002)
$\eta = 2$	0.025***	0.008***	0.001
	(0.005)	(0.002)	(0.003)
$\eta = 3$	0.029***	0.014***	0.003
	(0.006)	(0.002)	(0.003)
$\eta = 4$	0.043***	0.022***	0.007*
	(0.006)	(0.002)	(0.004)
$\eta \geq 4$	0.048***	0.025***	0.003
	(0.007)	(0.003)	(0.004)
Year-Sect FE		Yes	
Worker-Firm FE		Yes	
# Observations		4974049	
# Firms		67004	
# Workers		768084	

Notes: Table presents estimates from the worker-level version of the specification in equation (20). The outcome is the log of worker annual earnings divided by the number of months of employment, restricted to worker-months in full-time employment. In Panel A we present two-way fixed effects (TWFE), Sun and Abraham (2020) (SA) and IV estimates. In Panel B, we implement a heterogeneity analysis based on the quartile of a worker's initial earnings. We group workers based on their quartile in the distribution of (inflation-adjusted) monthly earnings in the first year we observe each worker since 2006. All three columns correspond to the estimates from the same regression after interacting the event-study dummies with worker-group dummies (bottom, middle, top). The regression in Panel B corresponds to the IV specification. The first-stage F-statistic for the IV column exceeds 50 in all cases. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Section 4 for discussion.

Table B6: Effects on Suppliers' Relative Employment of Low- vs. High-Wage Workers

	(1)	(2)	(3)	(4)	(5)
	TWFE	TWFE	SA	IV	PPML
$\eta = -4$	0.007	0.006	0.003	0.012	-0.005
	(0.025)	(0.025)	(0.026)	(0.028)	(0.056)
$\eta = -3$	0.000	-0.003	-0.003	0.002	0.054
	(0.021)	(0.021)	(0.021)	(0.023)	(0.055)
$\eta = -2$	-0.001	-0.004	0.003	0.010	0.122**
	(0.015)	(0.015)	(0.015)	(0.016)	(0.054)
$\eta = -1$	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)
$\eta = 0$	-0.029**	-0.033**	-0.035**	-0.033**	-0.026
	(0.013)	(0.014)	(0.014)	(0.015)	(0.038)
$\eta = 1$	-0.054***	-0.067***	-0.068***	-0.076***	-0.067
	(0.016)	(0.017)	(0.017)	(0.018)	(0.045)
$\eta = 2$	-0.017	-0.037**	-0.037*	-0.049**	-0.085*
	(0.018)	(0.019)	(0.019)	(0.021)	(0.044)
$\eta = 3$	-0.037*	-0.066***	-0.070***	-0.078***	-0.147***
	(0.020)	(0.021)	(0.022)	(0.024)	(0.049)
$\eta = 4$	-0.026	-0.067***	-0.075***	-0.084***	-0.143**
	(0.022)	(0.024)	(0.025)	(0.027)	(0.065)
$\eta \geq 4$	-0.001	-0.060**	-0.058**	-0.079***	-0.177***
	(0.022)	(0.025)	(0.028)	(0.029)	(0.056)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year-Sect FE	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes
Adjusted R^2	0.72	0.72	0.72	–	–
# Observations	94121	94121	94121	94121	142439
# Firms	14301	14301	14301	14301	16524
# Sector-Year Bins	2733	2733	2733	2733	2835

Notes: Table presents two-way fixed effects (TWFE), Sun and Abraham (2020) (SA), IV and PPML estimates for the supplier-level specification in equation (19). The first-stage F-statistic for the IV column exceeds 50. Standard errors clustered at the firm level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Section 4 for discussion.

Table B7: Transaction-Level Event Study

Panel A: Intensive Margin Effect on the Sales to the RS-MNE

	(1)	(2)	(3)
	TWFE	SA	IV
$\eta = -4$	0.003	0.006	0.001
	(0.025)	(0.025)	(0.026)
$\eta = -3$	-0.003	-0.006	0.001
	(0.018)	(0.018)	(0.019)
$\eta = -2$	-0.012	-0.017	-0.005
	(0.014)	(0.014)	(0.015)
$\eta = -1$	0	0	0
	(0)	(0)	(0)
$\eta = 0$	-0.003	-0.003	0.000
	(0.013)	(0.013)	(0.013)
$\eta = 1$	-0.004	-0.001	0.000
	(0.016)	(0.015)	(0.017)
$\eta = 2$	-0.010	-0.006	-0.009
	(0.021)	(0.020)	(0.022)
$\eta = 3$	-0.007	-0.005	-0.010
	(0.023)	(0.023)	(0.024)
$\eta = 4$	-0.045*	-0.046*	-0.057*
	(0.027)	(0.027)	(0.030)
$\eta \geq 4$	-0.061**	-0.060**	-0.069**
	(0.027)	(0.028)	(0.031)
Year-Supplier Sect FE	Yes	Yes	Yes
Year-MNE Sect FE	Yes	Yes	Yes
MNC-Supplier FE	Yes	Yes	Yes
Adjusted R^2	0.67	0.67	–
# Observations	281894	281894	281894
# MNCs	433	433	433
# Suppliers	14260	14260	14260
# Sup Sector-Year Bins	3036	3036	3036

Panel B: Total Sales to RS-Active MNEs (Intensive + Extensive Margins)

	(1)	(2)
	PPML	PPML
$\eta = -4$	-0.230***	0.021
	(0.045)	(0.044)
$\eta = -3$	-0.182***	-0.024
	(0.032)	(0.032)
$\eta = -2$	-0.095***	-0.008
	(0.023)	(0.022)
$\eta = -1$	0	0
	(0)	(0)
$\eta = 0$	-0.118***	-0.091***
	(0.019)	(0.019)
$\eta = 1$	-0.191***	-0.144***
	(0.028)	(0.028)
$\eta = 2$	-0.240***	-0.188***
	(0.036)	(0.039)
$\eta = 3$	-0.323***	-0.250***
	(0.044)	(0.048)
$\eta = 4$	-0.438***	-0.342***
	(0.051)	(0.057)
$\eta \geq 4$	-0.400***	-0.272***
	(0.054)	(0.057)
Firm FE	Yes	Yes
Year-Sect FE	Yes	Yes
Controls	No	Yes
# Observations	98576	65682
# Firms	11188	9682
# Sector-Year Bins	2727	2600

Panel C: Total Sales to Other (Non-RS) Buyers

	(1)	(2)	(3)	(4)
	TWFE	TWFE	SA	IV
$\eta = -4$	-0.041*	0.003	0.047**	0.001
	(0.022)	(0.022)	(0.023)	(0.024)
$\eta = -3$	-0.017	-0.007	0.030*	-0.001
	(0.018)	(0.018)	(0.018)	(0.019)
$\eta = -2$	-0.009	-0.012	0.010	-0.007
	(0.013)	(0.013)	(0.013)	(0.014)
$\eta = -1$	0	0	0	0
	(0)	(0)	(0)	(0)
$\eta = 0$	0.054***	0.011	0.003	0.014
	(0.011)	(0.011)	(0.011)	(0.012)
$\eta = 1$	0.048***	0.003	-0.008	0.002
	(0.014)	(0.014)	(0.014)	(0.016)
$\eta = 2$	0.012	-0.020	-0.033**	-0.027
	(0.016)	(0.016)	(0.016)	(0.018)
$\eta = 3$	-0.002	-0.029	-0.050**	-0.026
	(0.019)	(0.019)	(0.019)	(0.022)
$\eta = 4$	-0.041**	-0.045**	-0.066***	-0.053**
	(0.021)	(0.022)	(0.023)	(0.025)
$\eta \geq 4$	-0.107***	-0.075***	-0.140***	-0.088***
	(0.022)	(0.023)	(0.025)	(0.027)
Firm FE	Yes	Yes	Yes	Yes
Year-Sect FE	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Adjusted R^2	0.79	0.80	0.80	–
# Observations	169910	169910	169910	169910
# Firms	20477	20477	20477	20477
# Sector-Year Bins	2921	2921	2921	2921

Notes: Panel A presents estimates for the transaction-level version of the specification in equation (20). Panel B presents estimates of a PPML estimation of specification (19) with total sales to RS-active MNEs as the outcome. Panel C presents estimates from (19) of the effect of RS exposure on the sales to other (non-RS) buyers. TWFE stands for two-way fixed effects (TWFE) and SA for Sun and Abraham (2020). The first-stage F-statistics for the IV columns exceed 50 in all cases. Standard errors clustered at the firm level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Section 4 for discussion.

Table B8: Effect of RS Rollouts on the MNE Subsidiary Sales and Relative Size in the MNE Group

	(1) TWFE	(2) SA	(3) IV	(4) TWFE	(5) SA	(6) IV
$\eta = -4$	0.021	0.044	0.013	0.008	0.004	0.008
	(0.078)	(0.094)	(0.084)	(0.008)	(0.007)	(0.008)
$\eta = -3$	-0.028	-0.030	-0.035	0.007	0.006	0.007
	(0.075)	(0.085)	(0.080)	(0.007)	(0.008)	(0.007)
$\eta = -2$	-0.098*	-0.097*	-0.113*	0.010	0.009	0.011
	(0.056)	(0.055)	(0.059)	(0.013)	(0.013)	(0.014)
$\eta = -1$	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)
$\eta = 0$	0.038	0.035	0.038	-0.003	-0.000	-0.002
	(0.037)	(0.037)	(0.041)	(0.004)	(0.003)	(0.005)
$\eta = 1$	-0.046	-0.030	-0.031	-0.003	0.002	-0.003
	(0.066)	(0.065)	(0.070)	(0.006)	(0.005)	(0.007)
$\eta = 2$	-0.066	-0.036	-0.062	-0.005	-0.002	-0.005
	(0.082)	(0.082)	(0.090)	(0.008)	(0.005)	(0.008)
$\eta = 3$	0.003	0.061	0.012	-0.005	-0.001	-0.004
	(0.076)	(0.076)	(0.083)	(0.009)	(0.006)	(0.010)
$\eta = 4$	0.031	0.085	0.040	-0.003	0.000	-0.001
	(0.083)	(0.085)	(0.091)	(0.008)	(0.006)	(0.009)
$\eta \geq 4$	-0.021	-0.014	-0.017	0.001	0.005	0.004
	(0.090)	(0.091)	(0.098)	(0.007)	(0.007)	(0.008)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Sect FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.83	0.83	–	0.67	0.69	–
# Observations	4672	4672	4672	2016	2016	2016

Notes: Table presents two-way fixed effects (TWFE), Sun and Abraham (2020) (SA) and IV estimates for the MNE-level version of the specification in equation (19). In columns 1-3, the outcome is the log sales of the MNE subsidiary in CR. In columns 4-6, the outcome is the fraction of sales of the CR subsidiary in total global sales of the MNE. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Section 4 for discussion.

Appendix B.5 Additional counterfactual results

Figure B8: Welfare Implications of Allowing for Unemployment
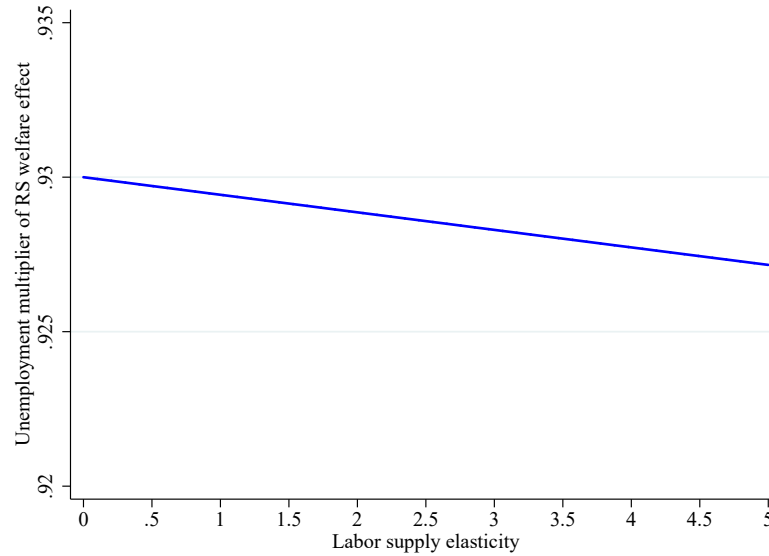
Notes: Figure plots the attenuating factor of the welfare effect of RS in a model with unemployment $\left(1 - \Lambda^U\right)$ across different values of the labor supply elasticity κ. The level of unemployment at the beginning of our sample is 7%. See Section 5.2 for discussion and Appendix A.6.1 for a detailed exposition.
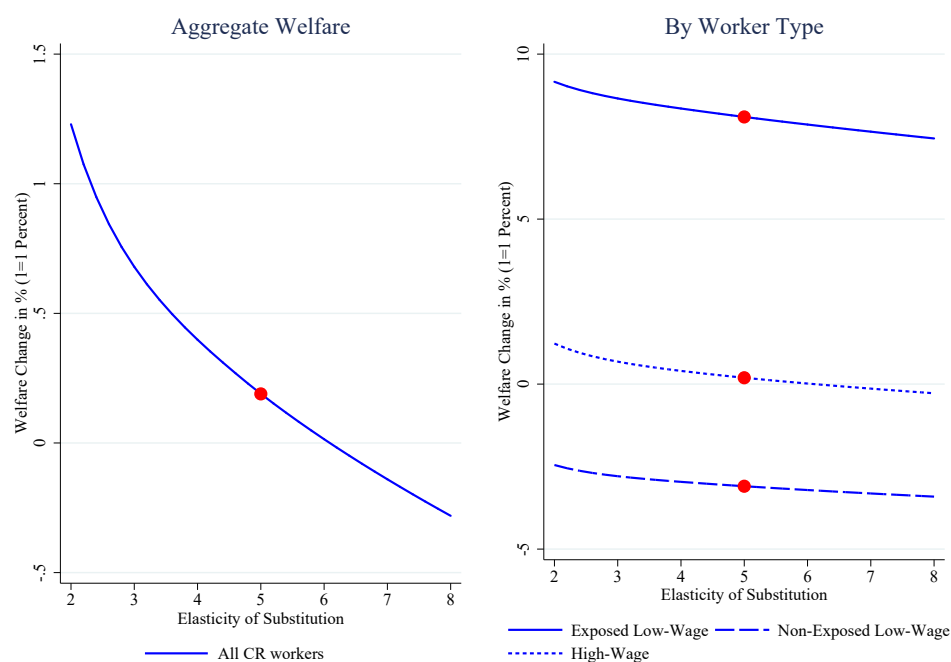
Figure B9: Sensitivity to the Fraction of $\hat{\tau}_R^l$ Captured by Workers
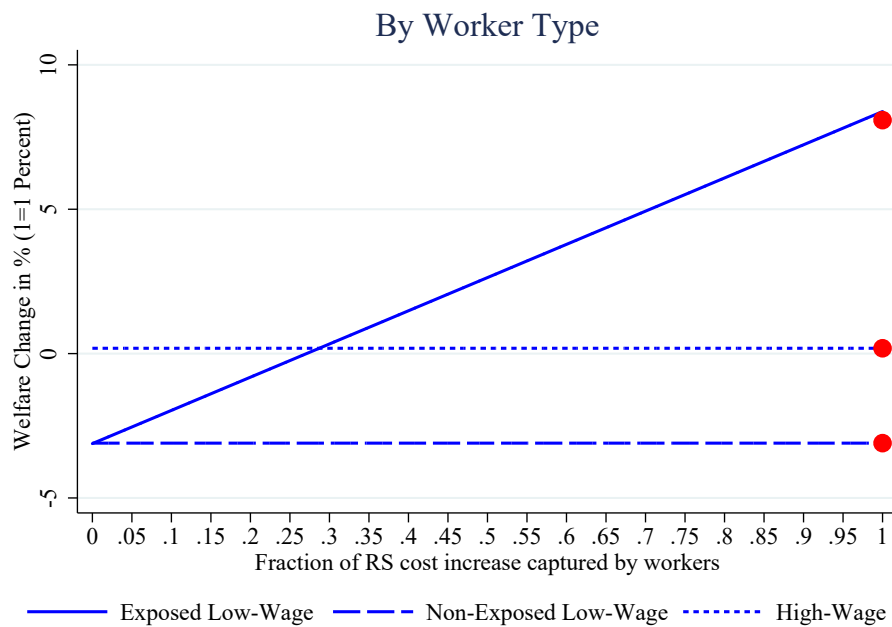
Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

Figure B10: Sensitivity to Alternative Values of the Elasticity of Substitution between Varieties (σ)

Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

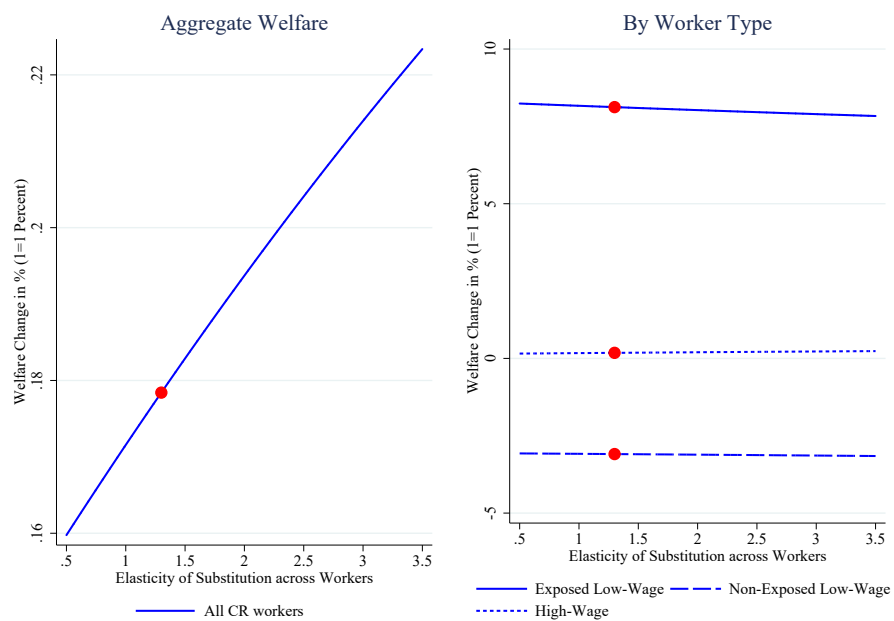Figure B11: Sensitivity to Alternative Values of the Pareto Productivity Distribution Shape Parameter (θ)
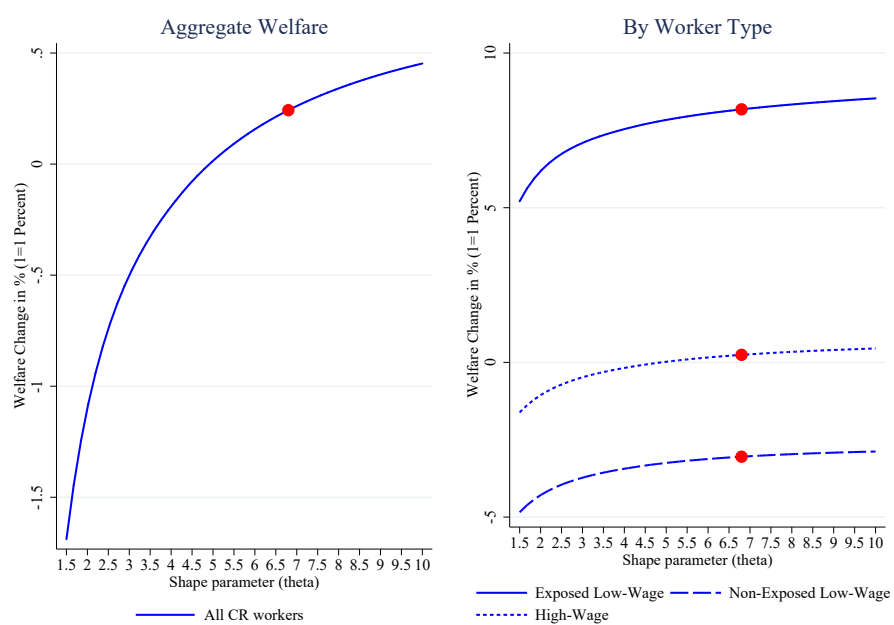
Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

Figure B12: Sensitivity to Alternative Values of the RS Cost Increase Pass-Through Rate (β)
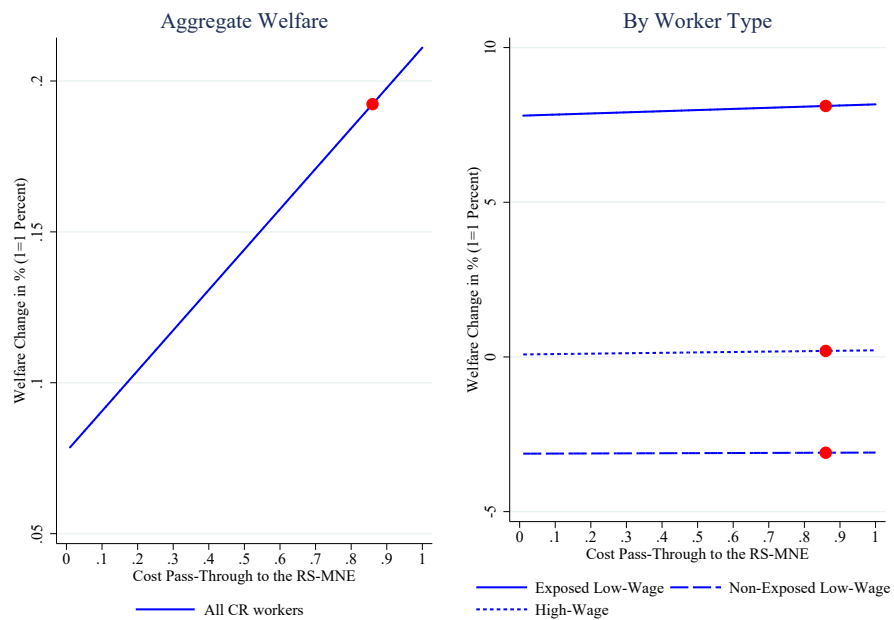
Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

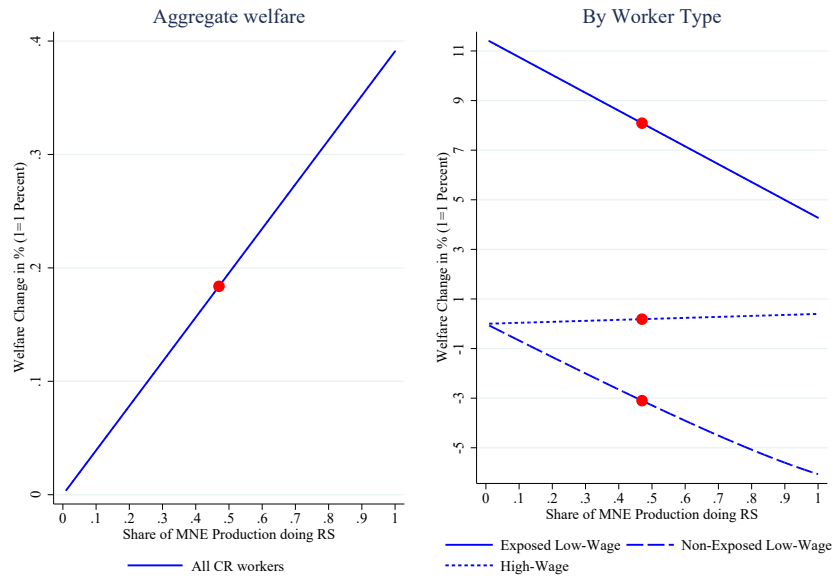Figure B13: Sensitivity to Alternative Values of the Elasticity of Substitution Between Worker Types (ρ)

Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

Figure B14: Sensitivity to Alternative Values of the RS-Induced Demand Shock $\left(\hat{d}_R\right)$
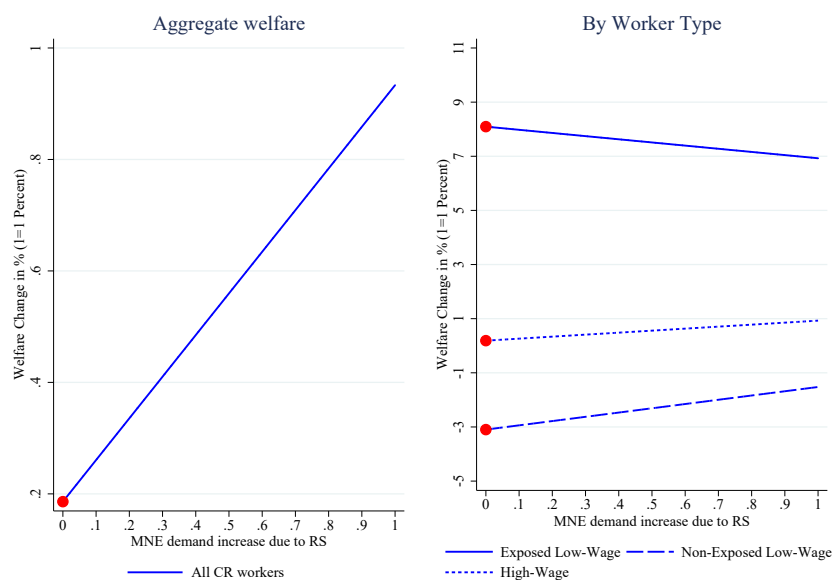
Notes: Red dots indicate our baseline parameter values. As the demand shock increases, MNE production in CR increases. This leads to (slightly) less positive welfare gains for exposed workers due to a reduction in domestic profits (redistributed to workers), as a larger share of domestic production is now done by MNE subsidiaries whose profits are owned by Foreign. At the same time, MNE subsidiaries that expand hire non-exposed workers, who now also benefit from RS requirements (that were already in place at the subsidiary). This explains the different slopes between exposed and non-exposed workers as the MNE demand shock increases. See Section 5.2 for discussion.

Figure B15: Sensitivity to Alternative Values of the Fraction of MNEs Implementing RS Policies (γ)
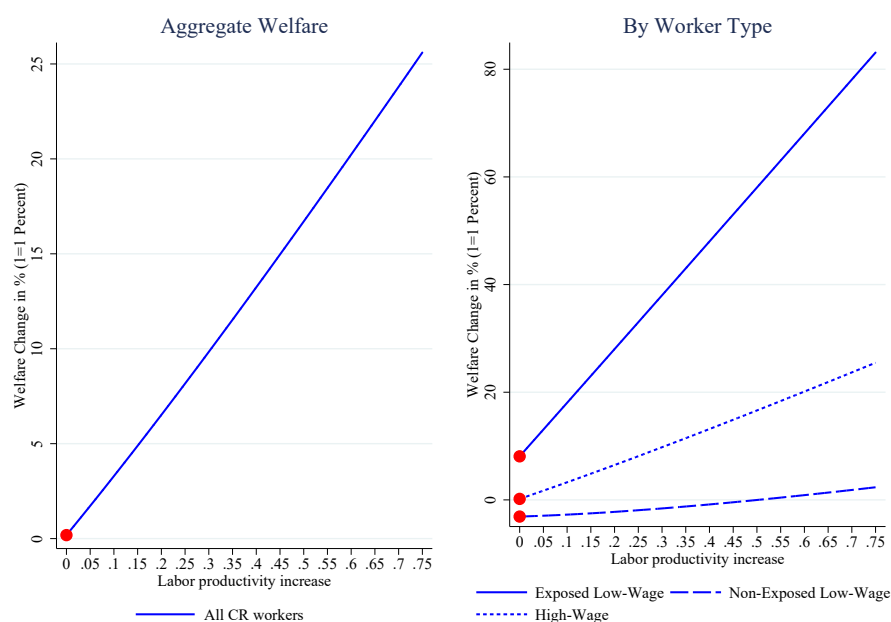

Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

Figure B16: Sensitivity to Alternative Values of the RS Cost Increase on Low-Wage Workers $(\hat{\tau}_R^l)$

Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

Figure B17: Sensitivity to Alternative Values of the RS-Induced Labor Productivity Improvement $\left(\hat{T}_R\right)$

Notes: Red dots indicate our baseline parameter values. See Section 5.2 for discussion.

References in appendices

David W Berger, Kyle F Herkenhoff, and Simon Mongey. Labor Market Power. *American Economic Review,* 112(4), 2022.

Nicholas Bloom, Renata Lemos, Raffaella Sadun, Daniela Scur, and John Van Reenen. World Management Survey - Manufacturing, 2021. URL https://doi.org/10.7910/DVN/OY6CBK.

Deborah Goldschmidt and Johannes F Schmieder. The Rise of Domestic Outsourcing and the Evolution of the German Wage Structure. *Quarterly Journal of Economics,* 132(3):1165–1217, 2017.

Liyang Sun and Sarah Abraham. Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects. *Journal of Econometrics,* 2020.