

The Shanghai Effect: Do Exports to China Affect Labor Practices in Africa?[★]

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24 January 2016

Forthcoming in *World Development*

[★] Earlier versions of this paper were presented at the 2014 Annual Meeting of the Midwest Political Science Association, the Research Symposium in Honor of Margaret Levi held at the University of Washington, October 2014, and the 2015 Annual Meetings of the International Studies Association. The authors are grateful for the comments of conference participants, as well as valuable comments from Amanda Clayton, Quan Li, Victor Shih, Erik Wibbels, and three anonymous reviewers. All remaining errors are the authors. Replication data and code can be found at faculty.washington.edu/cadolph.

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Abstract. To investigate whether Africa’s exports to China influence labor practices in Africa, we reconsider the debate over trade’s influence on regulatory standards in exporting countries. The first generation of trade–regulation scholars asked whether high levels of exports influenced regulatory standards of exporting countries, with inconclusive results. The second generation of scholarship focused not on how much a country exported but to whom it exported, identifying a “California Effect” by which firms and consumers in (mostly developed) importing countries projected their high regulatory standards on less developed export partners. Structural change – especially the rise of China as a major importer – poses a challenge to these optimistic findings. Drawing on insights from the analysis of compositional data, this paper introduces a third generation of trade–regulation research, which suggests examining not only with whom a country trades, but also how the composition of markets in a country’s export basket reshuffles over time. Specifically, we explore the possibility of a “Shanghai Effect” whereby African countries begin to reflect the lower labor standards of China, which has emerged as a major destination for their exports. We show that when a country increases exports to China, the net effect on domestic labor standards depends critically on the labor practices of other export destinations compositionally displaced by China exports. Our analysis of a panel of 49 African countries for the period 1985–2010 produces a small continent-wide estimate of China’s negative influence on African labor practices. In-sample simulation at the country level uncovers a moderate Shanghai Effect for a handful of countries only.

Do exports to China influence labor practices in African countries? International trade is widely recognized as an important mechanism for the cross-country diffusion of regulatory standards, norms, and industrial practices. Scholars suggest that importing countries can exploit market leverage to project their regulatory preferences onto their exporters abroad. Most major export destinations located in the Global North have higher regulatory standards than exporting countries in the developing world, but China, an emerging destination for a large share of African goods, has standards that are markedly lower than other major importers and even many African exporters.¹

We examine the possibility of a “Shanghai Effect” – the effect of exports to China on the domestic regulatory standards and industrial practices of exporting countries – that undermines labor practices in African countries catering to China’s growing demand for resources and products. Scholars note the rise in the importance of China as the destination for Africa’s exports (Mayer and Fajarnes, 2008). Yet there is no mention of how China’s rising trade salience might influence regulatory standards in Africa. Instead, this discussion tends to focus on the role of Chinese foreign direct investment (FDI) in Africa, causing some to confuse trade with FDI. To the best of our knowledge, ours is the first quantitative study to systematically examine the consequences of African exports to China on African labor practices. In some ways, this is a tougher test of the influence of international economic context on labor rights in exporting countries. FDI has a direct impact on production and labor practices because the foreign investor manages the production facility. In contrast, trade has an indirect impact via supply chain linkages only. Hence, we believe this study offers powerful insights to assess how the increasing salience of China as an importing economy (as opposed to a foreign investor) shapes labor practices across African countries.

As a broader contribution to the trade–regulation debate, we introduce a compositional data approach to the analysis of export-context effects on exporting countries. Using new, compositionally appropriate interpretations of export-context models, we show that when a country increases exports to a specific major importer, the net effects of that trade on domestic labor standards depend not only on the major importer’s labor standards, but also on the labor practices of other export destinations displaced by the new trade.

1 China’s emergence as Africa’s key export destination is aided by the broader structural context of the growing Chinese economy’s demand for raw materials, along with policy measures such as granting tariff-free entry to more than 400 products from Africa, arguably in order to expand China’s political influence in the continent (Bräutigam and Tang, 2014).

Our paper speaks to the literature on how trade (more specifically, exports) influences regulatory standards and industrial practices such as labor, environmental, and human rights in exporting countries. First generation trade–regulation studies focused on the role of export salience, assuming that exposure to global markets influences regulatory standards across exporting countries. This literature developed conflicting arguments and reported inconclusive results. Some found that high export salience leads to lower standards in exporting countries because firms in developed countries began outsourcing their products from developing countries to lower their production and labor costs. Seeking to retain and attract export opportunities, developing countries competitively lowered their regulatory standards, leading to races to the bottom. At the same time, developing country firms seeking a foothold in global markets sought to leverage their relative cost advantages by adopting abysmal labor practices.

Against this negative view of trade, others suggested that exposure to global markets created incentives for exporting firms to adopt superior production practices across countries (Perkins and Neumayer, 2007). These authors pointed to East Asian countries whose export-led growth led to improvements in domestic regulatory standards. They also noted that prior to the 1990s, regulatory standards tended to be much higher in the open economies of Western Europe compared to the closed economies of Eastern and Central Europe and the former USSR. From this perspective, exposure to the global economy creates incentives for exporting firms to upgrade their technology and seek superior quality. This engagement also creates avenues for the exchange of ideas and norms about appropriate public policies and corporate conduct, all of which leads to improvement in industrial practices and regulatory standards.

Second generation studies suggested that a focus on overall exports misspecified the variable of interest. What mattered for regulatory diffusion was not how much a country exported, but to whom. These studies disaggregated overall exports, recognizing that export-led regulatory diffusion reflected the standards of the destinations to which countries' goods were exported. The key mechanism was the influence exercised by firms and consumers in importing countries on the exporting countries, often called the California Effect (Vogel, 1995). Key actors in importing countries (such as environmental groups, human rights groups, and trade unions) pressured importing firms to improve on these counts, who in turn influenced their suppliers abroad. Scholars report on the positive influence of bilateral export pressures on environmental issues (Perkins and Neumayer, 2007), labor issues (Greenhill, Mosley, and Prakash, 2009), and human rights (Cao, Greenhill, and Prakash, 2013) in developing countries.

Because the largest export destinations are located in developed countries with high regulatory standards, the second-generation literature tended to report optimistic results for export-led diffusion. Unpacking the composition of export context that lies at the heart of second-generation models reveals important unexamined questions. First, suppose that a country's largest export destinations maintain low or even declining standards. Might we not observe a "Shanghai Effect" that reverses the optimistic California logic by diffusing low labor standards? Second, suppose that over time, a country shifts its exports towards markets with lower standards. To what extent will labor practices adjust to the new market context that exporters face? Third, assume that a country historically had "artificially" high labor standards because it exported to jurisdictions with higher labor standards. Now suppose this foreign pressure is removed because export markets have shifted to a new destination that neither has high labor standards nor demands its exporting countries establish such standards. Even without the active diffusion of low standards from the new importing destination to the exporting country, might the mere replacement of high-standards export jurisdictions (such as the EU and the US) with low-standards importers (such as China) lower domestic standards in exporting countries by reducing the salience of pressure from so-called "Californias?"

To systematically answer these questions and further work out the logic of the California Effect, we introduce a third generation approach to trade-regulation studies that takes seriously the country-specific compositional nature of export context. We examine not only to whom a country exports, but also how the changes over time in the saliences of export markets with different standards influence the regulatory standards of the exporting country. Like any set of variables that sums to a fixed constraint, the percentage of exports sent to each jurisdiction in a country's export portfolio are a form of compositional data (Aitchison, 2003): when a country sends a greater percentage of its exports to a given market, it must logically reduce the share of exports to some of its other partners.² And because aggregate measures of export context use the percentage composition of exports to weight exposure to other countries' labor standards, they are subject to a similar compositional logic. Therefore, to interpret the

² For examples of compositional data analysis in social science research, see Katz and King (1999) and Philips, Rutherford, and Whitten (2015), who analyze vote shares in multiparty elections, as well as Adolph, Breunig, and Koski (2007) and Lantz, Alexander, Adolph, and Montgomery (2014), who analyze state budgets priorities. Most relevant to the present analysis is Adolph (2013), who examines central bankers' career compositions and provides recommendations for interpreting compositional covariates.

export–context effects of an increase in exports to one country, we must “unpack” the aggregate estimates of export context effects in second generation models. In doing so, we make two contributions. First, we show that the aggregate results reported by second generation studies hide considerable variation in the trade–regulation relationship across exporting countries that should be disaggregated. Second, we show that this diversity is a direct result of variation in the compositional structure of exports in each country–period, and can only be fully understood by working through the tradeoffs that occur when the salience of one export market rises at the expense of another.

Empirically, we assess how rising exports to China – now Africa’s biggest trading partner overall (Johnston, Morgan, and Wang, 2015) – have influenced labor practices in African countries, even after controlling for inward foreign investment that may have independently influenced these practices. Although we find small to moderate aggregate estimates of China’s negative influence on African labor practices, continent-level estimates of the Shanghai Effect mask considerable variation at the country level. Both China export salience and tradeoffs between the different export contexts induced by each country’s composition of exports matter greatly in specific cases. Only in countries where exports to China have increased dramatically *and* have displaced exports to the high labor standards countries of the West do we observe noteworthy Shanghai Effects.

The next section of this paper reviews the trade–regulation literature and introduces the circumstantial evidence for a large, Africa-wide Shanghai Effect. The third and fourth sections explain the logic of compositional data and show how the export context variables popular in second generation studies can have strikingly different substantive implications depending on the compositional assumptions made in their construction. The fifth section explains our estimation strategy, the sixth and seventh sections present our results, and the final section concludes.

Regulatory Races to the Top and Bottom

Whether a focus on exports hurts or helps labor rights has been extensively debated in the globalization literature (Mosley and Uno, 2007; Greenhill, Mosley, and Prakash, 2009; Elliot and Freeman, 2003; Caraway, 2009). Globalization pessimists suggest that because developing countries can create comparative advantage by keeping labor costs low, both governments and exporting firms have incentives to suppress labor rights. Exports contribute to economic growth and generate resources for the state in a variety

of ways. Hence, the interests of exporters and ruling elites coincide, which leads to suppression of labor rights.

In contrast, globalization optimists argue that exports can raise countries' labor standards. They view international trade as facilitating economic development which, in turn, creates a demand for institutions that will lead to superior labor rights. Furthermore, seeking to regulate their supply chains to meet their standards, importing firms will become active actors in spreading good labor practices to their exporters located in developing countries.

Second generation trade–regulation scholars sought to shift the discussion from examining the impact of aggregate exports on labor practices to how the varying levels of labor practices of importing destinations might independently influence exporting countries' labor practices. For these scholars, the crucial variable of interest was not *how much* a country exported, but *to whom* it exported. The ability to deny market access gave actors in importing countries the necessary leverage to incentivize exporters to improve their labor practices. This leverage might come from a range of sources. Activist groups may undertake private politics (Baron, 2003) to put pressure on importing firms to ensure that their suppliers abroad respect labor rights. The case of child labor in the carpet industry reflects this sort of dynamic (Basu, 1999), as does the speed of change in Bangladesh's labor practices (with varying degrees of success) following the Rana Plaza tragedy and subsequent concerted pressure from apparel importers in developed countries (Deegan and Islam, 2014).³ Finally, pressure may emanate from global or regional preferential trade agreements that allow importing countries to impose human rights conditionalities on exporting firms seeking access to their home markets (Hafner-Burton, 2005).

Bilateral trade-induced regulatory diffusion has been dubbed the California Effect by David Vogel (1995). By virtue of being the largest market for automobiles in the United States, California was able to incentivize automobile manufacturers to incorporate its standards (which were more stringent than the federally mandated ones) in their products sold in other states. In their cross-country study of labor standards, Greenhill,

3 Regarding the causes of the Rana Plaza tragedy, one reviewer suggests the rapid growth of trade may have overstretched production capacity, leading to a supply chain filled by numerous small sub-suppliers over whose labor, health, and safety standards buyers exercised little control. Yet in some cases, rapid growth may also encourage suppliers to develop longer term perspectives in order to consolidate their economic gains. If so, they may actually begin to pay more attention to factors such as labor and environmental issues that might attract the attention of overseas activists. We believe this issue merits further attention.

Mosley, and Prakash (2009) build on this argument to suggest that there is a California Effect in the context of labor rights as well. While the California Effect in Vogel's narrative was an artifact of legal design, and limited to product standards, Greenhill *et al* suggested that the concept of the California Effect could travel internationally, in the context of process-based issues instead of product standards, and in contexts where the importing jurisdiction did not have the legal power to impose higher standards. Indeed, under the WTO, importing countries cannot subject imports to process-based standards such as labor standards. But the WTO does not prohibit private actors from lobbying importing firms, or directly lobbying exporters to improve their labor practices. Lobbying can still have teeth if labor and activist groups can credibly threaten boycotts and name-and-shame campaigns. As a result, exporting countries might have incentives to improve certain process standards in response to demands from consumers, stakeholders, and activists located in importing countries, even in spite of the WTO's restrictions on such action being taken at the inter-governmental level.

Much of the California Effect literature examines the diffusion of practices from importing countries with superior standards to exporting countries with lagging standards. What if the importing countries are not necessarily ahead of exporting countries? What if only a handful of exporting country's import destinations are ahead, while the others lag? Would bilateral export-based dynamics lead to the ratcheting down of the exporter's domestic standards? This question has become particularly relevant with the rise of China as a major export destination for developing country exports.

In particular, China's rise has been significant in the context of Africa. Unlike Western countries, China tends to follow a policy of non-interference with internal affairs of its trading partners (Jacobs, 2011; Scheipers and Sicurelli, 2008). This is perhaps because China itself objects when Western countries seek to interfere in its domestic labor or human rights practices. Unlike the California Effect narrative, there is no governmental pressure of African governments from Chinese governments to uphold some sorts of labor standards. In some ways, this removes the "artificial" stimulus these countries were subjected to when they tended to rely predominantly on the EU countries, thereby allowing them to revert to their "normal" labor practices. We dub this reversal the "Shanghai Effect."

To access resources, the Chinese government has supported authoritarian and corrupt regimes throughout Sub-Saharan Africa (De Grauwe, Houssa, and Piccillo, 2012). This runs counter to the efforts of Western powers to make African leaders establish better governance of which human and labor rights are an important component. Chi-

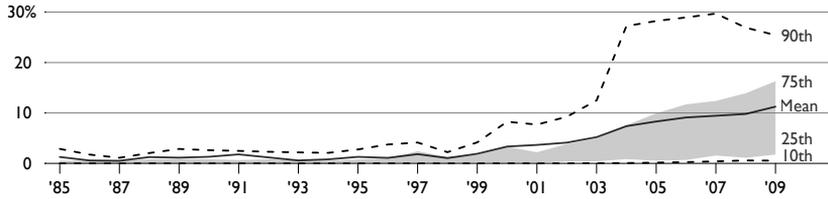
nese importers are supposed to be cost conscious (De Grauwe, Houssa, and Piccillo, 2012) – hence exporters in Africa face relentless cost pressures (Harney, 2008). Given the absence of a strong countervailing force either in domestic politics or in export markets (such as labor groups in China), these exporters have incentives to lower labor standards to remain competitive in Chinese markets.

Labor and activist groups in importing countries are important drivers of the California Effect. For labor groups, an important motivation for such campaigns is to protect the economic interests of domestic workers. This may not hold in the Chinese case. Though in recent years China has witnessed labor unrest, this is in response to poor working conditions at home (Chen, 2000, 2003). China does not have independent labor unions (Gang, 2003) and emerging labor groups typically do not see foreign workers competing with Chinese workers for the same jobs. There is a virtual absence of activist groups to put pressure on exporters to China (or Chinese firms importing from abroad) regarding labor practices.

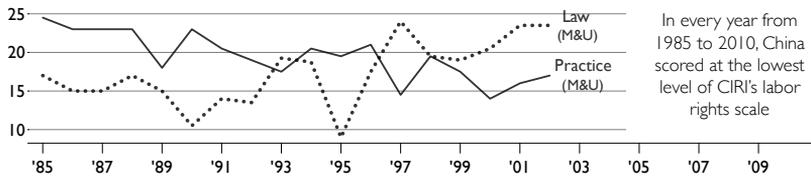
Finally, private politics is facilitated by a free press. Activists deploy a range of tactics including naming-and-shaming campaigns and shareholder resolutions. A free press enhances the effectiveness of these tactics by allowing activist groups to impose reputational costs on firms. Indeed, reputational assets now exceed physical and financial assets in the balance sheets of several firms (Eccles, Newquist, and Schatz, 2007). Absent a free press, firms do not face the same kind of reputational vulnerability, even if the state allows activist groups to function and to protest. In sum, in the Chinese context, governmental and private actors lack incentives to put pressure on exporting countries to improve labor practices. Without such pressures, ordinary price competition should encourage African importers to revert to *ex ante* labor practices that had been previously inflated by pressures from EU/US markets. Furthermore, relentless cost pressure from Chinese importers may incentivize still lower labor standards to gain even a small additional price advantage.

Circumstantial evidence from export data and labor standards time series supports the notion that increased exports to China had a negative impact on African labor standards. The top panel of Figure 1 shows the average African country's exports to China expanded steadily through 2002, then exploded over the following seven years. At the same time, Mosley and Uno's (2007) relatively fine-grained measure of labor standards in practice shows substantial declines in China and in the average African country through 2002, the most recent year available (second and third panels of Figure 1). Although we don't know whether Mosley and Uno's index would have fallen further as African exports to China took off after 2002, we can turn to Cingranelli et al's (2014)

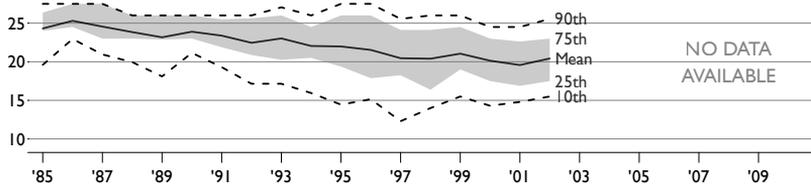
Africa's exports to China have risen sharply
exports/GDP, by country and year



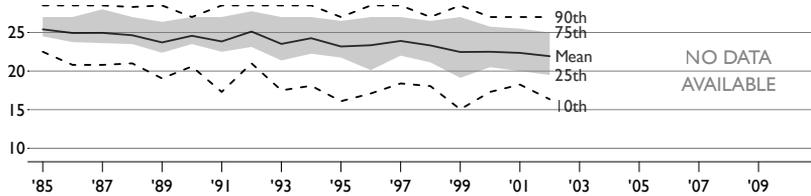
China's labor standards have fallen in practice, if not in law
various measures



African labor practice has fallen on average, but has also diverged
Mosley-Uno scores



...as have African labor laws
Mosley-Uno scores



...while less detailed data suggest African labor rights fell further post-2002
CIRI worker rights scores

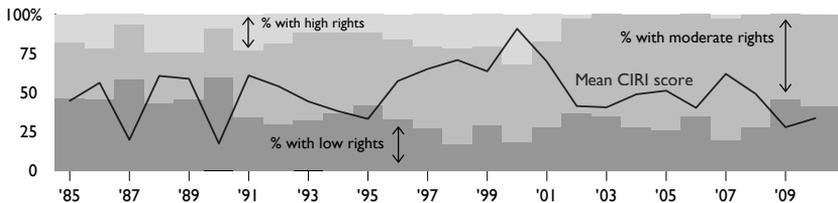


Figure 1. *Export Flows and Labor Standards, Africa–China, 1985–2010.* Authors' calculations using data from Barbieri, Keshk, and Pollins (2009), Mosley and Uno (2007), and Cingranelli, Richards, and Clay (2014).

coarse three point-scale of worker rights, which is available through 2010. Here we see a sharp decline in the average worker rights of African countries from 2000 onwards.

This picture, however, is incomplete in at least three ways. First, as Figure 1 shows, variation across African countries in labor standards and exports to China is large and growing over time, so continent-level generalizations may overlook heterogeneity across African countries.

Second, each of our measures of labor standards has disadvantages: Mosley and Uno's data are not available after 2002, during the period of greatest Africa–China trade, and Cingranelli et al's data may be too coarse to accurately measure trade–regulation linkages. And Mosley and Uno's measure of labor *laws* (also available through 2002) shows a similar decline in African labor standards, but this index also suggests Chinese labor laws sharply improved from 1995 to 2002, sharply at odds with actual practice.

The third and arguably most serious problem with inferring relationships from Figure 1 pertains to the compositional nature of export portfolios. For those African countries which experienced increasing levels of exports to China, what export partners did China compositionally replace? And did the replaced countries have superior or worse labor practices than China? As we shall see, on these questions turn the entire issue of whether more trade with a country like China harms domestic labor regulation or not.

Understanding Compositional Constraints

To understand how compositional constraints work and how they apply to export portfolios, it helps to explore a thought experiment. Suppose that a grandparent is deciding how to divide a dollar among her grandchildren Alice, Bob, and Carol. Although the grandparent is generous, she is not entirely fair, and initially plans to give Alice fifty cents, Bob ten cents, and Carol forty cents. Because Alice is her favorite grandchild, the generous but unfair grandparent decides to give even more to Alice – and if Alice gets more of the dollar, Bob or Carol (or both) must get less. For example, if the grandparent wishes to give seventy cents to Alice instead of fifty, then Bob and Carol's

shares must fall by a total of twenty cents. In the language of compositional variables, the grandparent's decision to give x more cents to Alice instigates a *perturbation* of the original composition, and the remaining components of the composition must adjust by a net $-x$ cents to maintain *closure* of the composition (Aitchison, 2003).

Because the dollar constraint forces other components down when Alice's share rises, we cannot meaningfully refer to Alice getting more "holding Bob and Carol's shares constant." Nor is there only one way to partition the twenty-cent reduction between Bob and Carol. Many combinations of losses are logically possible: at the extremes, the grandparent could impose all of the loss on Carol, or shift as much as half of the loss to Bob, or allocate any other logically consistent combination of losses between these cases. The compositional constraint makes the connections between changes in one child's share of the dollar and another child's share impossible to ignore.

The compositional constraint also has implications for the effects of the divided dollar on other variables. Suppose that Alice plans to spend her dollar on apples, while Bob prefers to buy broccoli, and Carol chocolate. If Alice's share of the dollar increases, then overall not only must there be more apples bought than before, but there must be less broccoli and/or chocolate. Whether Alice getting a larger share of the dollar has a similar impact on broccoli purchases as it has on chocolate purchases depends on several things: (1) the initial composition of the division before Alice's share increased, (2) the size of the increase in Alice's share, and (3) the rates of replacement from each other child to Alice; that is, what proportion of the increase in Alice's share flows from each other child's share.

These factors can interact in various ways. Suppose, as before, that the initial division is $\{0.5, 0.1, 0.4\}$. Assume a "replacement rule" setting the rate of transfer from other children to Alice proportional to each child's original share, so that Bob provides 20 percent of Alice's gains and Carol 80 percent. This is the only rule that preserves the original ratio of Bob's share to Carol's share; for this reason proportional reduction makes a good candidate for a neutral replacement rule (Adolph, 2013). In the present example, neutral replacement implies that after Alice's share increases, the overall composition is $\{0.70, 0.06, 0.24\}$. Note that the ratio of Bob's share to Carol's share remains the same (1:4) after this reallocation. Any other replacement rule would impose disproportionate losses on either Bob or Carol.

If we ask a substantive question, such as "did giving Alice more of the dollar increase healthy eating overall?", we find that the answer depends, because the generous grandparent need not be neutral in sourcing the additional funds for her favorite grandchild, Alice. She might decide on more extreme replacement rules, such as "take as much as

possible of Alice's increase from children who buy candy," in which case the new composition will be $\{0.7, 0.1, 0.1\}$, with all of the increase in Alice's share coming from Carol. In this case, the shift to Alice has had a double effect in favor of healthy eating by increasing apple consumption and reducing candy buying. But if the grandparent declares that Alice's gains should come, as far as possible, from vegetable buyers, the new composition is $\{0.7, 0.0, 0.3\}$. In this case, Bob's share is wiped out, Carol still loses ten cents to maintain the dollar constraint, and healthy eating increases only partially, because half of Alice's apples replace not Carol's candy, but Bob's broccoli.

Trade between nations is not so different. Instead of a grandparent dividing a dollar, we might have an African country allocating shares of its exports to three trading partners. Because the same ingot of copper cannot be shipped to two partners at once, total exports are subject to some degree of constraint so long as the total supply of exports is even somewhat inelastic. For Alice, Bob, and Carol, substitute the trading partners Australia, Bangladesh, and China. If the African nation begins to send more exports to China than before, it is likely to be constrained, at least in the short run, to send fewer exports to either Australia or Bangladesh or both. In this way, we cannot meaningfully talk about increasing exports to China without simultaneously describing how these exports displace specific prior export relationships. In particular, it does not make sense – or at least imposes unspoken assumptions about changes in total export production – to speak of an increase in exports to China “holding all exports to all other countries equal.”

As in the divide the dollar example, the export composition constraint can affect variables correlated with exports. Whereas exporting more to China may have a direct impact on domestic regulation in the African country through the cost pressures discussed above, there is a second, potentially equally important mechanism by which growing Chinese trade matters: the degree to which exports to China disproportionately replace either exports to Australia (or other high-standard countries) or exports to Bangladesh (or other low-standard countries). If export replacement is neutral with respect to labor standards (follows proportional replacement), we might see a moderate Shanghai effect when an African country exports more to China. But if exports to China replace a similarly low labor standard partner, the Shanghai effect may be nullified. On other hand, if China replaces a country previously exerting a positive California effect, then the swap in trading partners may have a doubly negative impact on domestic regulation in the African exporter's home market. In the next section, we show how these insights can be combined with the export-context measures developed in the second-generation trade literature to formalize four different models of

export replacement mapping out the range of export-context effects, as mediated by the compositional constraint.

Compositional Constraints and Export Context Tradeoffs

Our goal is to understand how tradeoffs within the composition of exports create multiple pathways by which a change in the volume of exports to a single partner alters the exporting country's overall export context, and through that context, influences its regulatory standards. For clarity, we first define several terms. Let $j \in \{1, \dots, J\}$ index the exporting countries under study, let $k \in \{1, \dots, K\}$ denote their possible import destinations, and let $t \in \{1, \dots, T\}$ refer to the time periods examined. Then we label the volume of exports (in common currency units) exported from country j to country k in year t as $v_{j \rightarrow k, t}$. Note that the total exports V_{jt} by country j in year t is simply the sum over j 's exports to each trading partner k . Likewise, denote the total trade (imports plus exports) for country j and year t as W_{jt} . Finally, define s_{jt} , a regulatory standard observed in country j in period t : this is the outcome of interest.

Following Greenhill, Mosley, and Prakash (2009), we can now define country j 's export context, C_{jt} , as the export-weighted average of labor standards across j 's export partners:

$$C_{jt} = \sum_{\forall k} s_{kt} v_{j \rightarrow k, t} / V_{jt} \quad (1)$$

Now our objective is to understand how variation in the domestic labor standards of the exporting country, s_{jt} , depends on export context, C_{jt} , especially in the case of increased exports to a specific country. Our main theoretical contribution is to note that increased exports from country j to k may come at the expense of foregone exports to either all of j 's other export destinations, $\neg k$, or to some specific subset of them. Unless the total volume of exports V_{jt} increases by *exactly* the amount that exports between j and k increases, the compositional constraint implies a countervailing reduction in j 's total exports to other countries. This process of export replacement means that increases in $v_{j \rightarrow k}$ affect export context *both* through the direct effect of increased exposure to k 's labor standards *and* through simultaneously diminished exposure to the labor standards prevailing across (some set of) other countries.

In our application to China's growing presence in African export portfolios, the compositional logic has a clear implication: the total effect on domestic labor standards of increased exports from an African nation to China depends not only on China's labor standards, but also on (1) the degree to which China replaces other export destinations

and (2) the nature of labor standards in the specific export destinations replaced by China.

Determining the counterfactual patterns of exports that would have prevailed in each African country had exports to China *not* increased is a large project we do not undertake here. Instead, as a first cut, we examine four specific *replacement rules* which loosely bound the range of possible export-context effects of increased China exports on labor standards. Figures 2 and 3 illustrate these replacement rules, as well as the nature of export context tradeoffs, using a simplified example. Consider a hypothetical exporting country in Africa which currently exports to only four partners. We summarize this country's exports across all product markets using a common unit. Initially, this African country exports two units of goods to a low-standard country with a labor practice score of 10; two units to China, which we assign (for the sake of argument) a labor practice score of 15; two units to a medium-standard country with a labor practice score of 24; and four units to a high standard country with a labor practice score of 27.5. Thus the total exports of this country are 10 units and the weighted average of labor practice scores across its export jurisdictions is 20.8.

Now imagine that this country expands exports to China by one unit. Our hypothetical scenario is incomplete until we specify whether and how these new exports to China replace prior exports to other trading partners. We will consider four patterns of export replacement that yield changes in export context which vary in both sign and magnitude. Although these are not the only possible replacement rules, we expect other replacement patterns to fall inside the range of variation we explore here; that is, excepting extreme cases (e.g., a modest rise in exports to one country combined with a collapse in other export relationships), typical patterns of trade replacement should roughly correspond to convex combinations of our example rules.

Rule 1: New Exports Add to Total Exports. Suppose that the added unit of exports represents the product of labor and raw materials previously unemployed by the exporting country, and that production of these exports draws on new foreign direct investment for all capital requirements. In this case, the new unit of exports will not displace any pre-existing exports, instead simply adding to total exports, which rise to 11 units. The first panel of Figure 2, in purple, shows that in our hypothetical example, the export context of labor standards slightly declines to 20.3 as a result of China's greater relative salience to the exporter, and the reduced *relative* (though not absolute) intensity of trade with the high standard country. Note that compositional context is still important when new exports simply add to total exports: for example, if China had

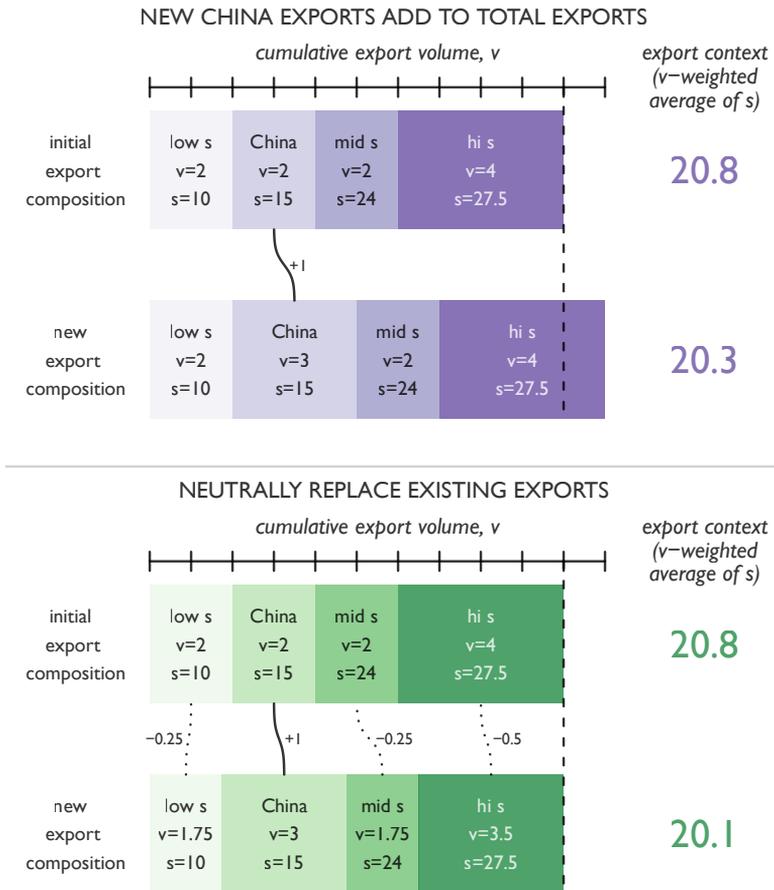


Figure 2. The compositional logic of export context given a hypothetical increase in exports to China (part I). v indicates the volume of exports sent to an export partner and s indicates the prevailing labor standards in that partner’s home market. Each panel shows the composition of exports and resulting export context of labor standards before and after an increase in exports to China; panels differ only in the assumed relationship between new exports to China and existing exports to other partners. The dashed line marks the original total volume of exports (the compositional constraint). All quantities are hypothetical. See the next figure for additional replacement rules.

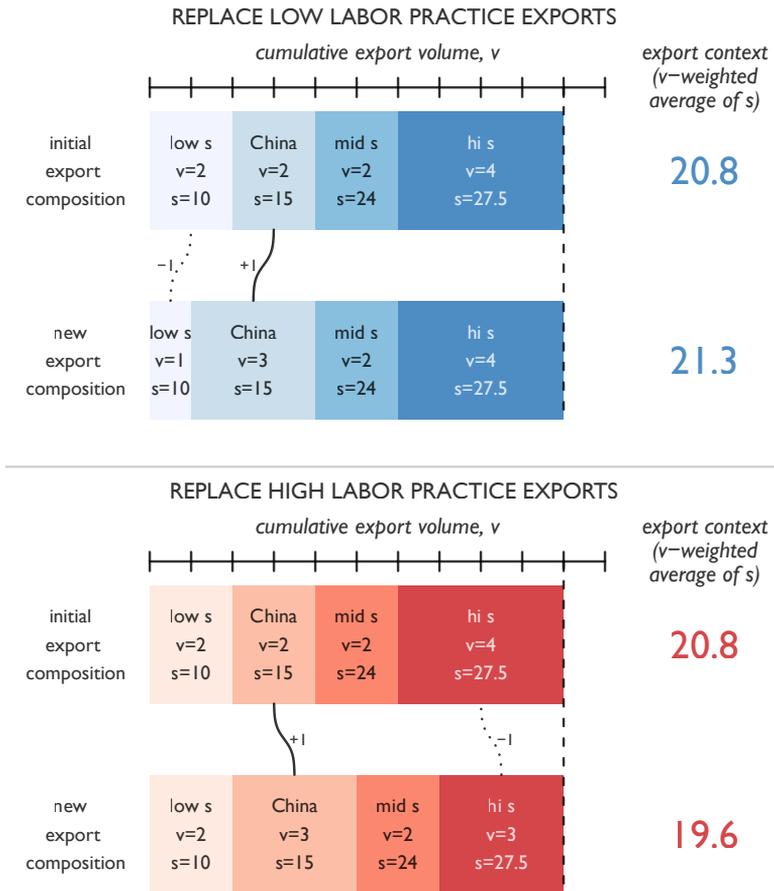


Figure 3. The compositional logic of export context given a hypothetical increase in exports to China (part 2). All quantities are hypothetical. See the previous figure for details and additional replacement rules.

higher labor standards than the jurisdiction to which the median prior export product flowed, then our hypothetical exporting country would instead see an *improvement* in its export context for labor standards. This follows from the construction of export context as a weighted average across all export destinations.

Now suppose the added unit of exports to China presents an opportunity cost for the use of labor, materials, or capital. Perhaps our example country is a copper-producer and already exports as much copper as it can produce annually, at least in the short-run. There may also be long-run constraints on the expansion of exports; for example, diminishing returns to scale might raise the marginal cost of production above world price levels. In this case, total exports remain at the same level, and increased exports to China consist of exports previously destined for other countries. As a result of these tradeoffs across export flows, the composition of export destinations by level of labor standards becomes even more important.

Rule 2: New Exports Neutrally Replace Existing Exports. Under this replacement rule and the two that follow, we assume the total export constraint does bind and consider three different kinds of tradeoffs between China and other export destinations. Rule 2 explores the simplest tradeoff, in which exports to each destination other than China decrease in proportion to their original levels as exports to China rise. This replacement rule is illustrated in the second panel of Figure 2, in green. Adolph (2013) notes that applying ratio-preserving reductions to other components respects the compositional constraint in a neutral way, placing the focus on the direct effect of the new exports to China. In our hypothetical example, neutral replacement (Rule 2) lowers the volume of exports to the low standard partner by -0.25, to the medium standard partner by -0.25, and to the high standard partner by -0.50. The net effect of these changing export flows is a new labor-standards trade context of 20.1, representing a slightly greater reduction than simply adding new exports to total exports under Rule 1.

Rule 3: New Exports Replace Low Labor Practice Exports. For this replacement rule, we again suppose the total export constraint is binding, but relax the assumption that exports to China neutrally replace exports to each other trading partner. Instead, we consider an extreme form of “biased” replacement, in which exports previously destined for whichever partners had the lowest labor standards instead go to China. (If the increase in exports to China is greater than the prior volume of exports to the lowest labor standard partner, then the tradeoff extends to the next lowest standard partner, and so on, until the reduction of exports to the lowest standard partners exactly balances

increased exports to China.) In our hypothetical example, just as exports to China rise by one unit, so do exports to the lowest standard partner fall by one unit. Under Rule 3, increased exports to China actually *improve* the exporter's labor standards context to 21.3 because China's labor standards are not quite as low as the previous incumbents'. The size and direction of this effect will vary in real world examples based not only on the expansion of exports to China and China's own labor standards, but also on the amount of exports a given country previously shipped to low standard countries, rendering the effect of increased exports to China on labor-standards export context highly heterogenous across exporters.

Rule 4: New Exports Replace High Labor Practice Exports. In our final replacement rule, we again treat the total export constraint as binding but now assume that exports to China displace exports to other major importers, who generally have much higher labor standards than China. (As before, if the increased exports to China are larger than the prior volume of exports to the highest standard partner, we assume that exports to the next highest standard partner also decline, and so on, until the increase in exports is exactly offset.) In our hypothetical example, at the same time that exports to China rise by one unit, exports to the high standard country fall by one unit. This leads to the largest reduction in the exporter's exposure to high labor standards: the labor standard score of the average export partner is now 19.6. We suspect this scenario is particularly relevant to African countries that have historically exported large quantities of raw materials to advanced industrial economies: if these countries shift their export streams from high labor standard jurisdictions to lower ones like China, we will find larger impacts of export context once we take compositional effects into account.

The key point to take from Figures 2 and 3 is that when we imagine a hypothetical increase in exports to China that changes the export context of a specific African country, the sign and magnitude of the change in export context depends critically on the prior composition of export destinations (both in terms of export volume and labor standards) *and* on the ways in which new exports to China either add to total exports or replace exports to countries with either higher or lower standards than prevail in China. In turn, looking at the aggregate effects of increased China exports across Africa will likely mask a great deal of variation across countries – even those with similar rates of growth in exports to China – due to differences in the kinds of export markets China replaced.

Estimating Export Context Tradeoffs

We start with the linear panel model used by Greenhill, Mosley, and Prakash (2009) to estimate the effects of export context on labor standards. The general form of this model, which is also our Model 1, assumes that standards s_{jt} follow an autoregressive process that is influenced by lagged export context, $C_{j,t-1}$, total trade as a percentage of GDP, $W_{j,t-1}/g_{j,t-1}$, and other covariates, $\mathbf{x}_{j,t-1}$:

$$s_{jt} = C_{j,t-1}\gamma + (W_{j,t-1}/g_{j,t-1})\tau + s_{j,t-1}\phi + \mathbf{x}_{j,t-1}\beta + \alpha + \epsilon_{jt} \quad (2)$$

Although the model above is our main focus, we also consider a disaggregated specification partitioning the overall export context $C_{j,t-1}$ into two pieces: an “all-but-China” export context, $C_{-China,t-1}$, and a “China-only” export context, $C_{China,t-1}$. (These pieces sum to the original $C_{j,t-1}$.) Separating export context into several components in the panel data model itself allows us to attempt to directly estimate an idiosyncratic China export context effect that may differ fundamentally from the effects of other export contexts; however, data limitations make this difficult to do with any precision.

Following Greenhill, Mosley, and Prakash (2009), our initial outcome variable is a version of Mosley and Uno’s (2007) measure of labor standards as observed in practice, scaled between 0 and 27.5 such that higher values indicate better observance of high standards. We restrict our scope to the 49 African countries for which we observe data for any years in the period 1985–2002, the period for which Uno and Moseley’s measure of labor standards is currently available.⁴ We later consider alternative measures of s_{jt} , including Mosley and Uno’s measure of labor standards as written in laws (available for the same countries and periods) and Cingranelli et al’s three-point scale of labor rights, available for 49 countries from 1985 to 2010.

As in Greenhill, Mosley, and Prakash (2009), we control for total trade (imports plus exports) as a fraction of GDP to test first generation theories of trade–regulation effects. To test second generation theories, we also control for the export context of labor standards, which we construct for each country annually by combining either Mosley and Uno’s or Cingranelli et al’s measures of labor standards with the dyadic trade data provided by the Correlates of War dataset (Barbieri, Keshk, and Pollins, 2009). Because

4 We retain yearly dyadic level data on export intensity from each African country to each trading partner, as well as that partner’s contemporaneous labor standards, in order to construct appropriate counterfactual export contexts for each country in the post-estimation stage of the analysis.

it provides another flow through which firms may transmit labor standards across borders, we also control for foreign direct investment (FDI) as a share of GDP (Mosley and Uno, 2007; Neumayer and de Soysa, 2005). Likewise, because trading agreements often regulate human rights practices, we follow Hafner-Burton (2005) and control for countries that have either enforceable preferential trading agreements (Hard PTA) or non-enforceable preferential trading agreements (Soft PTA). We control for democracy (Polity), which previous research found to be correlated with greater respect for labor rights (Mosley and Uno, 2007; Neumayer and de Soysa, 2005); the log of population, which earlier research found to be negatively correlated with human rights (Poe, Tate, and Keith, 1999; Richards, Gelleny, and Sacko, 2001); and GDP per capita (in 2005 dollars at purchasing power parity). Finally, drawing on the the UCDP/PRIO Armed Conflict database (Gleditsch, Wallensteen, Eriksson, Sollenberg, and Strand, 2002), we code a dummy variable for the presence of (high or moderate levels of) civil war, on the grounds that human rights violations increase when a governments' security is under threat (Hafner-Burton and Tsutsui, 2005). Descriptive statistics for all variables appear in the Appendix.

Estimation of the model's parameters is straightforward, but interpretation of them is not.⁵ Regardless of which estimator we use, the same post-estimation problem arises: in order to assess the effects of a change in exports from country j to country k under the model, we need to recalculate export context $C_{j,t-1}$ after increasing $v_{j \rightarrow k, t-1}$. But to calculate this new context, we must make some assumptions about the nature of export replacement, that is, we must hypothesize new values of exports to other countries, $v_{j \rightarrow -k, t-1}$. As we have already seen, the net change in export context depends on the initial volume of exports to all partners, the labor standards prevailing in those partners' home markets, and the replacement rule across export relationships.

Rather than assume a single set of post-estimation assumptions is correct, our solution is to show the counterfactual effects of an increase in exports to China under each of the four replacement rules discussed in the preceding section of the paper. To make our counterfactuals as relevant and grounded as possible, we take as given the historically observed levels of all covariates in each country under the "fully-observed"

5 The main results for Model 1 shown in Table 1 are least squares estimates with panel-corrected standard errors to compensate for panel heteroskedasticity (Beck and Katz, 1995), but our results are robust under alternative estimation approaches, including sweeping out fixed effects – along with any unmeasured time-invariant confounders at the country level – and/or using unadjusted standard errors.

period (for Mosley-Uno data, this is 1995–2002; for CIRC data, this is 2002–2010).⁶ For Mosley-Uno outcomes, we then consider one of three hypothetical changes in that country’s exports to China: (1) suppose exports to China were double the observed level in each year from 1995 to 2002, (2) suppose exports to China were held at the observed 2009 levels (the most recent available) in each year from 1995 to 2002, and (3) suppose exports to China increased in each year from 1995 to 2002 by 10 percent of that country’s total exports in that year. We combine each hypothetical with each replacement rule to produce twelve counterfactual scenarios. For each scenario, we dynamically simulate the change in each country’s labor standards as a function of the new counterfactual export context, the new (potentially unchanged) total trade volume, and the observed historical values of all other covariates.⁷

For models of Cingranelli et al’s data, we have the luxury of computing in-sample counterfactuals using the historical values of covariates right up to 2010. In this case, we can formulate three parallel counterfactuals to directly test the impact of expanding exports to China over the last decade: (1) suppose exports to China were double the observed level in each year from 2002 to 2010, (2) suppose exports to China were held at the observed 2002 levels in each year from 2002 to 2010 (the mirror image of our test for Mosley-Uno’s shorter time series), and (3) suppose exports to China increased in each year from 2002 to 2010 by 10 percent of that country’s total exports in that year. Again, we combine these hypotheticals with our four replacement rules, and dynamically simulate the resulting twelve scenarios to obtain in-sample counterfactual labor standards for each studied country as a function of export context.

6 We restrict counterfactual simulations to these shorter timeframes because it is over these ranges that we have complete data for the vast majority of our countries (43 of 49 countries). Although the models are estimated on longer unbalanced panels (with all 49 countries), our dynamic in-sample simulation from these models requires complete historical records for the simulated cases.

7 Dynamic simulation is appropriate because our model controls for a lag of the dependent variable. As a result, the effects on the outcome variable of a durable change in a covariate build up over time, eventually plateauing at $\beta/(1 - \phi)$. For any reasonable autoregressive parameter ϕ , this is strictly larger than the “single-period effect” captured by β . Focusing on β alone thus substantially understates the substantive strength of relationships between the covariates and the outcome variable, whereas focusing on the long-run level $\beta/(1 - \phi)$ may overstate relationships. Our solution is to iterate the model over a fixed historical period to obtain reasonable in-sample estimates of counter-factual effects. See Adolph (2013) for further details of this kind of dynamic simulation.

Table 1. Linear panel regressions of African labor practices, 1986–2002.

Covariate	Model 1			Model 2			Model 3		
	est.	se	<i>p</i>	est.	se	<i>p</i>	est.	se	<i>p</i>
Overall Export Context _{<i>t</i>-1}	0.15	0.08	0.05	0.18	0.09	0.04	—	—	—
China Export Context _{<i>t</i>-1}	—	—	—	—	—	—	0.38	0.21	0.07
Other Export Context _{<i>t</i>-1}	—	—	—	—	—	—	0.18	0.08	0.03
Trade/GDP _{<i>t</i>-1}	-0.54	0.40	0.18	-0.96	0.62	0.12	-0.58	0.40	0.15
FDI/GDP _{<i>t</i>-1}	0.67	1.65	0.68	0.32	1.84	0.86	0.57	1.65	0.73
Hard PTA _{<i>t</i>-1}	-0.90	0.59	0.13	-1.14	0.64	0.08	-0.89	0.59	0.13
Soft PTA _{<i>t</i>-1}	-1.08	0.33	<0.01	-1.80	0.42	0.00	-1.04	0.33	0.00
log GDP per capita _{<i>t</i>-1}	-0.43	0.17	<0.01	—	—	—	-0.43	0.16	0.01
Polity _{<i>t</i>-1}	0.05	0.02	0.06	0.03	0.04	0.40	0.05	0.02	0.05
log Population _{<i>t</i>-1}	-0.45	0.13	<0.01	—	—	—	-0.46	0.13	0.00
Civil War _{<i>t</i>-1}	-0.62	0.36	0.09	-0.97	0.51	0.06	-0.68	0.36	0.06
Labor Rights _{<i>t</i>-1}	0.55	0.03	<0.01	0.34	0.04	<0.01	0.55	0.03	<0.01
Constant	17.05	3.42	<0.01	—	—	—	16.60	3.44	<0.01
Outcome Source	Mosley & Uno			Mosley & Uno			Mosley & Uno		
Period	1986–2002			1986–2002			1986–2002		
Fixed Effects				x					
PCSEs	x			x			x		
<i>N</i>	755			770			755		
<i>R</i> ²	0.48			0.29			0.48		
AIC	3187			3025			3186		

Results: The Shanghai Effect in Context

Our analysis proceeds in two steps: first we use a linear panel data model to estimate the extent to which a country's aggregate exposure to export partners' labor standards influences the country's own labor standards, then we use post-estimation simulation to understand under what conditions and in which countries this influence manifests as a Shanghai Effect.

Table 1 provides the estimated coefficients of three linear panel models of labor practices in African countries, as measured by Mosley and Uno (2007). The first model produces estimates substantively similar to those in Greenhill, Mosley, and Prakash (2009); in particular, we find a positive and significant association between the labor practices of a country's export destinations and that country's own labor practices. The second model goes beyond Greenhill, Mosley, and Prakash (2009) to show these results are robust even when country fixed effects are removed from the data, which bolsters our confidence that our results are not confounded with unmeasured country characteristics (e.g., natural resource endowments, production sectors, cultural institutions, and geographic location, among other factors). The third model attempts to estimate an id-

iosyncratic China effect on labor standards by disaggregating the China and non-China components of export context. While the resulting coefficient for exposure to Chinese labor practice is positive as expected, it is too imprecisely estimated to distinguish at conventional significance levels from the export context effects of other countries, or indeed from zero effect. This is neither surprising nor a reason to discount influence from China exposure – attempts to directly estimate the export context effects of specific export jurisdictions are unlikely to yield sharp estimates without long time series including numerous cases of very high levels of exports to that partner.

Thus we concentrate on Model 1 and use the pooled estimate of export context effects to calculate in-sample counterfactuals positing increased China exports (more details on the broadly similar fixed effects results can be found in the next section). As we have noted, doing so is important under any model of California or Shanghai Effects because of the need to specify a replacement rule for the impact of increased exports to China on the relative salience of other export jurisdictions. Without specifying a replacement rule, we are unlikely to compute logically consistent counterfactuals of export context. Nor is it enough to just look at the estimated coefficient: we have already seen that the same hypothetical change in exports to China can push the export context variable up or down depending on the country and replacement assumptions in question. Put another way, in the usual interpretation of linear regression, we imagine a covariate has increased by one unit, and report β as the corresponding change in our outcome. But for compositional variables like export context, we don't know what number to multiply β by until we take the compositional constraint into account.

Thus we turn to our simulation results, starting with in-sample simulation from 1995–2002 of each of our 43 fully-observed countries. Each plot in Figure 4 shows the expected change in labor practice in response to an increase in exports to China, relative to the expected labor practice under the historically observed export composition of each country over time. Comparing the plot reveals how export-context effects vary across countries given different counterfactual export levels and replacement rules. It is immediately clear that our model predicts the effects of export context will vary widely in response to compositional assumptions, both in terms of the average effect across the full panel of 43 countries and in terms of the specific effect in each country.

The first row of plots illustrates the expected change in labor standards in response to increased China exports under the assumption that new exports to China simply add to total exports without displacing any other exports (Rule 1). Under Rule 1, doubling exports to China has only trivial expected effects in every country we observed: although labor standards are expected to fall (or stay unchanged) in every country,

no decline is greater than a quarter-point on a 37.5 point scale. However, for many African countries, exports to China had far more than doubled by 2009. In the middle plot of the first row, we see that taking into account the observed change in the salience of China exports, a handful of countries would have fallen by between half a point and a full point on the labor practice scale had their recent increase in Chinese exports occurred earlier. Nevertheless, most countries would have seen only trivial changes in labor standards, primarily due to a relative dearth of exports to China from many African countries even as late in 2009. This is borne home by the final plot in the first row, which shows that virtually every country in Africa would have experienced labor standards approximately 0.25 points lower than otherwise expected had China exports represented a 10 percent larger fraction of total exports in each country on the continent during the earlier period. The clear conclusion is that if Chinese exports had displaced no other exports, then even in recent years the negative effects of those exports on labor standards would have been moderate and concentrated in a handful of countries.

The second row of plots considers the neutral replacement rule, in which an increase in exports to China replaces exports to all other countries in proportion to prior levels of exports (Rule 2). Because Chinese labor standards are near the middle of spectrum of labor standards among African countries' trading partners and because the level of total trade has no significant effect on labor standards, neutral replacement yields similar results to the no-displacement scenario: again, if African exports to China neutrally replaced each other export destination, then even in recent years we would expect at most moderate cuts to labor practice in a small set of African countries.

The "biased" replacement rules (rows 3 and 4) tell a very different story. If each African country experiencing an increase in exports to China simply shifted their exports from their lowest standard partners to China, then (looking at the middle column of the third row) increasing China exports to 2009 levels would have had positive effects in some countries, negative effects in others, but rarely any noteworthy impact in either direction. Yet if exports to China instead displaced other major export destinations with relatively high labor standards, such as the United States and European Union, then (looking at the middle column of the fourth row) the negative effects of 2009-levels of exports to China would be amplified, with nine countries seeing half a point or more decline in labor standards.⁸

⁸ In our main results, we assume "biased" replacement works from the most extreme partner (in terms of labor standards) inwards. For Rule 3, this means new China exports first replace exports to the lowest standard partner, then the next lowest, and so on until sufficient exports

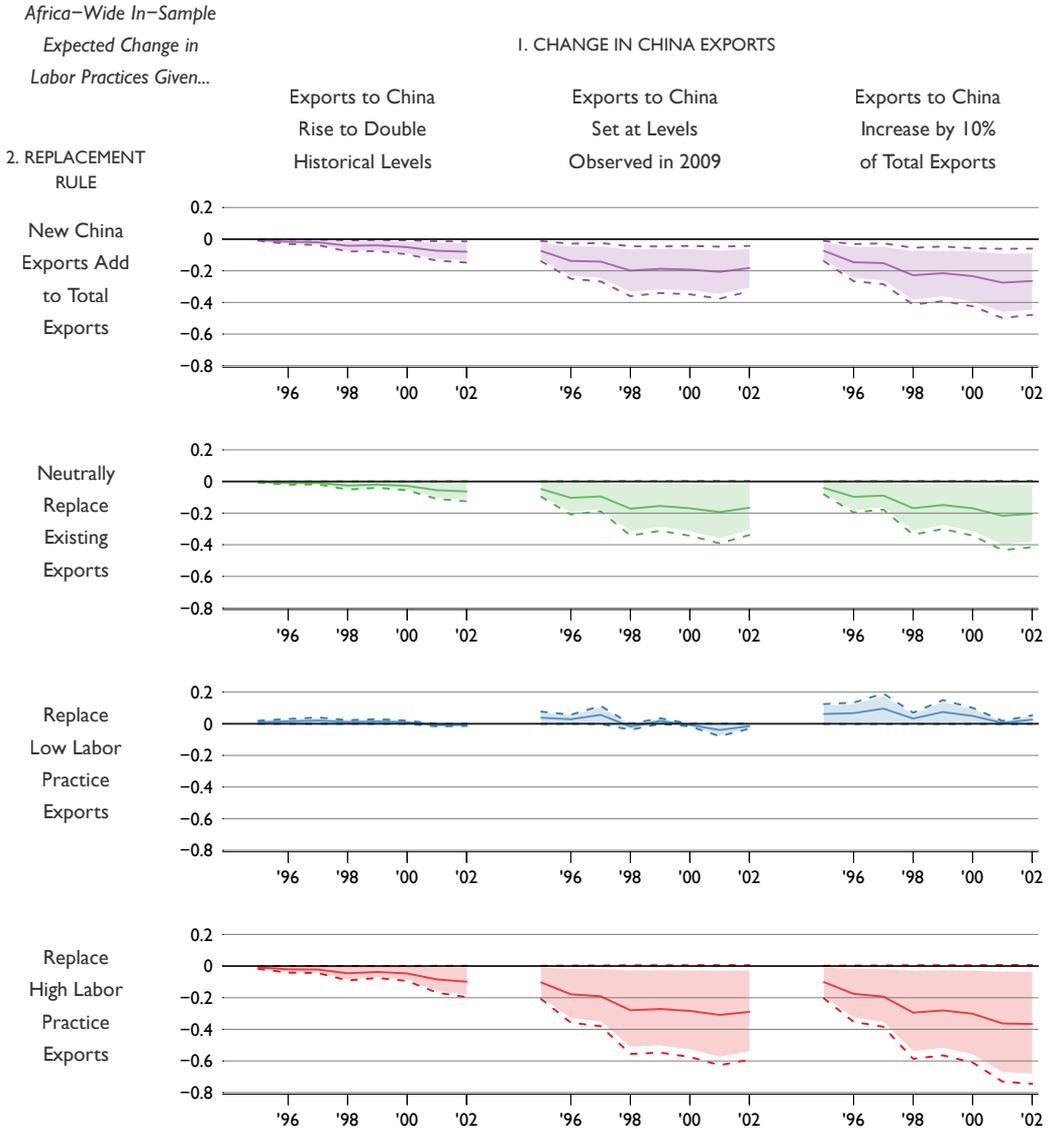


Figure 5. Continent-wide weighted average in-sample counterfactual change in African labor practice (Mosley-Uno) under higher levels of China exports, by year and replacement rule. Lines represent the population-weighted average of the country-level expected differences shown in Figure 4. Dashed lines are 90% CIs and shaded regions are 95% CIs; these include estimation uncertainty from the parameters of Model 1. See Figure 4 for further details.

We summarize our simulation results with two further figures. The first, Figure 5, shows the effect of increased exports to China aggregated across all African countries, weighted by population. The shaded regions in this plot mark 95% confidence intervals, confirming the differences discussed hitherto are statistically significant at conventional levels for Africa as a whole. These plots reinforce the importance of replacement rules: Africa-wide, the rise of exports to China most likely yielded noteworthy declines in labor standards only to the extent they replaced exports to jurisdictions with high labor standards.

Because export-context effects vary so much as a result of each country's specific mix of export partners, Figure 6 takes a closer look at the country-by-country results. Here, we zoom in on the predictions contained in the middle column of Figure 4 to show the expected change in labor standards in each country we would have seen by 2002 if the 2009 levels of China trade occurred earlier (symbols indicate different replacement rules; shaded or solid colors indicate statistically significant results). The results suggest exports to China probably lowered labor standards primarily in Mauritania, the Democratic Republic of Congo, Zambia, Burkina Faso, Sudan, Mali, Ethiopia, the Republic of Congo (Brazzaville), Benin, and Namibia. But even in these countries, the effects of rising China exports are mostly only noteworthy to the extent they displaced trade to high labor standard jurisdictions, and only rarely do we expect them to have lowered labor practice scores by even 0.25 standard deviations units.

Out of the ten countries for which we find noteworthy Shanghai Effects, those experiencing the largest estimated decline in labor practices are countries where China accounts for a large proportion of exports. Mauritania and Zambia, the countries with the biggest and third-biggest Shanghai Effects, sent 45 percent and 46 percent of total exports to China, respectively. As of 2010, the bulk of exports to China from African countries consisted of extractive resources. Mauritania's major export product is iron; Zambia exports copper, and Mali gold. Among the countries with measurable Shanghai effects, only Sudan (an oil exporter), Ethiopia (primarily a coffee exporter), and

have been eliminated with other partners to exactly match the increase in China trade. Alternatively, we considered replacement by quantile, which is slightly less accurate but computationally simpler. Under replacement-by-quantile, new China exports first replace exports to jurisdictions in the lowest (say) decile or vigintile of labor standards, and then the next decile or vigintile, and so on. The country-by-country and quantile-by-quantile approaches lead to substantively and statistically similar results. Note that in either approach, it is important to keep track not of the global ranking of countries by labor standards, but the relative rank of export partners at play for each specific exporting country in each specific year.

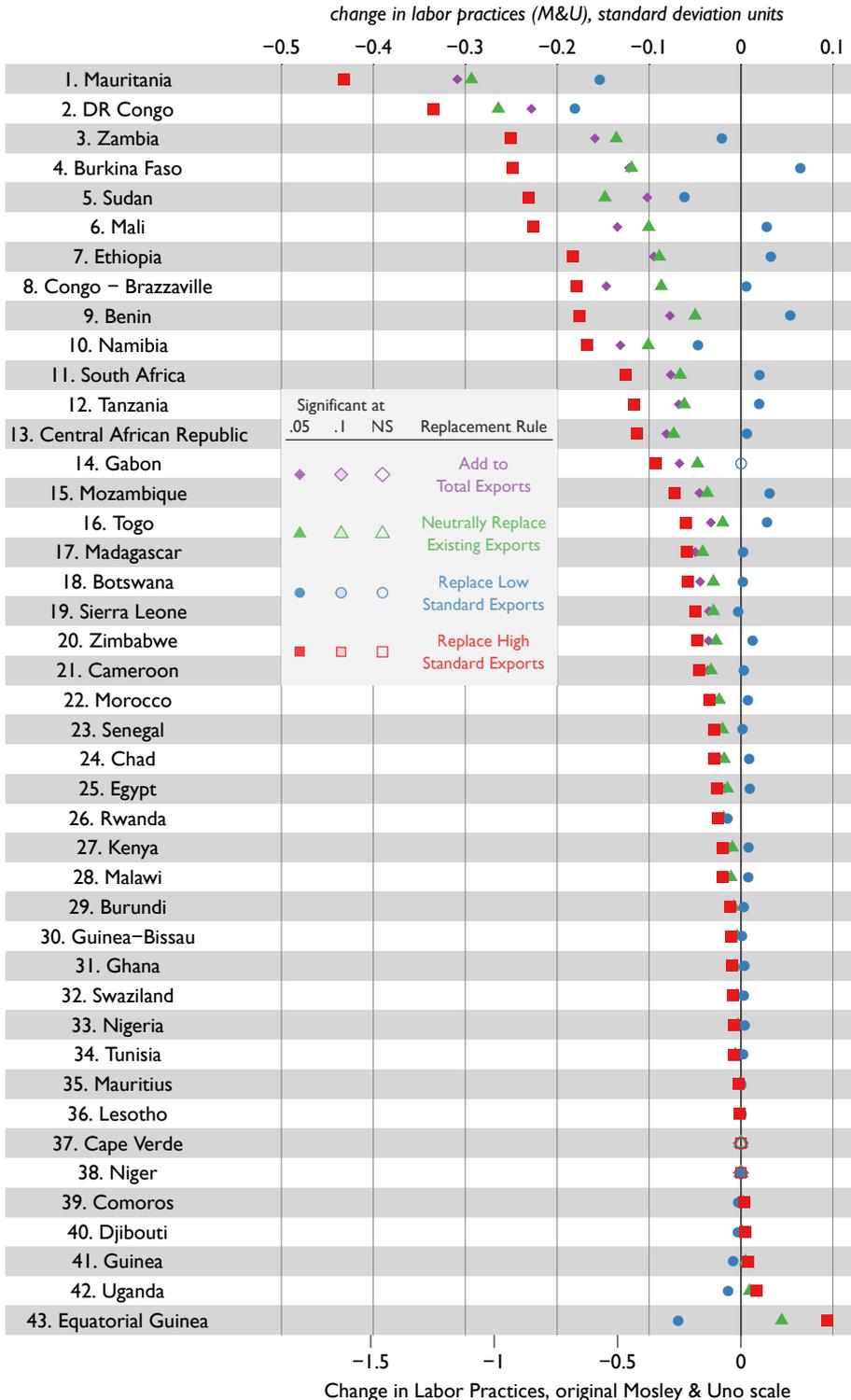


Figure 6. *Expected change in African labor practice (Mosley-Uno) if 2009 levels of exports to China had prevailed in 2002, by country and replacement rule.* Symbols indicate alternative replacement rule assumptions. Solid (shaded) symbols indicate results with 95% (90%) CIs bounded away from zero. Countries are sorted by expected reduction in labor standards under the high replacement assumption. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 1995 and iterating through to 2002 (only the last year of the simulation is shown here), using the estimates provided by Model 1 from Table 1.

the Republic of Congo (an oil exporter) buck the trend of exporting metals. This pattern extends even to countries with still-smaller Shanghai Effects, such as South Africa, which exports a variety of metals, and Tanzania, a gold exporter (Hausmann, Hildago, Bustos, Coscia, Simoes, and Yildman, 2013).

Robustness: Alternative Measures of Labor Standards

The main limitation of our analysis so far is that our measure of labor standards – which we take from Mosley and Uno to serve as both the outcome variable for African countries and as an integral component of export context – has not been updated since 2002. The results in the previous section are thus somewhat speculative, suggesting that higher exports to China would have the stated effects if each country’s labor standards remained at 2002 levels and if the relationship between export context and domestic labor standards persisted unchanged through 2009. A second, related criticism is that our results depend on a single concept and measure of labor standards, which are notoriously difficult to measure.

In this section, we address both problems. First, we re-estimate our model of African labor standards using Mosley and Uno’s labor laws data, reflecting the state of African labor laws as written over the period 1986–2002. Second, we use an entirely different data source, Cingranelli et al’s (2014) measure of worker rights, available up to 2010. By incorporating actual data from the past decade, we obtain direct evidence from the period of high China exports as a check on the forecasts presented in the last section.

Table 2 shows the results of three new panel data models. Model 4 replicates Model 1, but uses labor laws instead of labor practice as both its outcome and the basis of export context. We find that labor laws in countries receiving exports from African countries are systematically positively related to labor laws in sending countries, although this

Table 2. Linear panel regressions of African labor rights, various sources and periods.

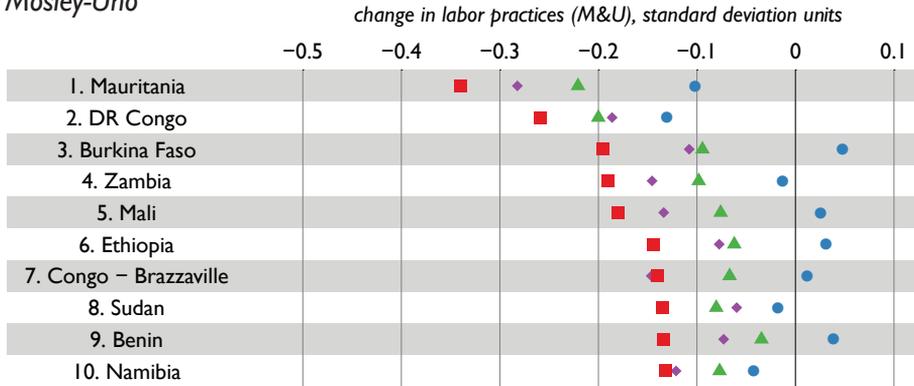
Covariate	Model 4			Model 5			Model 6		
	est.	se	<i>p</i>	est.	se	<i>p</i>	est.	se	<i>p</i>
Overall Export Context _{<i>t</i>-1}	0.12	0.07	0.10	0.08	0.05	0.08	—	—	—
China Export Context _{<i>t</i>-1}	—	—	—	—	—	—	0.06	0.24	0.80
Other Export Context _{<i>t</i>-1}	—	—	—	—	—	—	0.08	0.05	0.14
Trade/GDP _{<i>t</i>-1}	-0.71	0.33	0.03	-0.06	0.06	0.31	-0.06	0.06	0.31
FDI/GDP _{<i>t</i>-1}	1.73	1.19	0.15	-0.07	0.22	0.75	-0.07	0.22	0.75
Hard PTA _{<i>t</i>-1}	0.69	0.51	0.18	-0.08	0.06	0.18	-0.08	0.06	0.19
Soft PTA _{<i>t</i>-1}	-0.60	0.23	<0.01	0.02	0.03	0.57	0.02	0.03	0.58
log GDP per capita _{<i>t</i>-1}	-0.14	0.15	0.34	-0.01	0.02	0.81	-0.01	0.02	0.82
Polity _{<i>t</i>-1}	0.05	0.02	0.03	0.01	0.00	<0.01	0.01	0.00	<0.01
log Population _{<i>t</i>-1}	-0.38	0.11	<0.01	-0.01	0.02	0.71	-0.01	0.02	0.71
Civil War _{<i>t</i>-1}	-0.24	0.31	0.45	-0.05	0.06	0.36	-0.05	0.06	0.36
Labor Rights _{<i>t</i>-1}	0.67	0.03	<0.01	0.55	0.03	<0.01	0.55	0.03	<0.01
Constant	12.34	3.26	<0.01	0.81	0.37	0.03	0.81	0.37	0.03
Outcome Source	Mosley & Uno			CIRI			CIRI		
Period	1986–2002			1986–2010			1986–2010		
Fixed Effects									
PCSEs	x			x			x		
<i>N</i>	755			1133			1133		
<i>R</i> ²	0.54			0.37			0.37		
AIC	3064			743			743		

result is only statistically significant at the 0.1 level. We are not surprised this result is weaker than our results for labor practice, as the latter is arguable more salient to private actors placing pressure on African exporters, while laws may in some cases be intentionally unenforced window-dressing.

Model 5 turns to Cingranelli et al's measure of worker rights. In some ways, this is a remarkable result: despite the coarseness of this measure, we detect a positive relationship between labor standards in export-receiving countries and the labor standards of African exporters. This result is only significant at the 0.1 level, which is again unsurprising. Although there are more observations in the CIRI data compared to Mosley-Uno, the outcome variable contains much less information – few African countries lie at the top of the scale, so the measure is effectively binary. This should lead to substantial measurement error, yielding less precise results. As Model 6 in Table 2 shows, it remains impossible to distinguish a China-specific coefficient in the CIRI data, even in data up to the present. This may be (rather weak) evidence against the notion that China currently has a unique effect on its partners, or it could simply reflect the difficulty of estimating country-specific export context variables with precision.

Labor Practice using Fixed Effects

Mosley-Uno



Labor Laws

Mosley-Uno



Worker Rights

CIRI

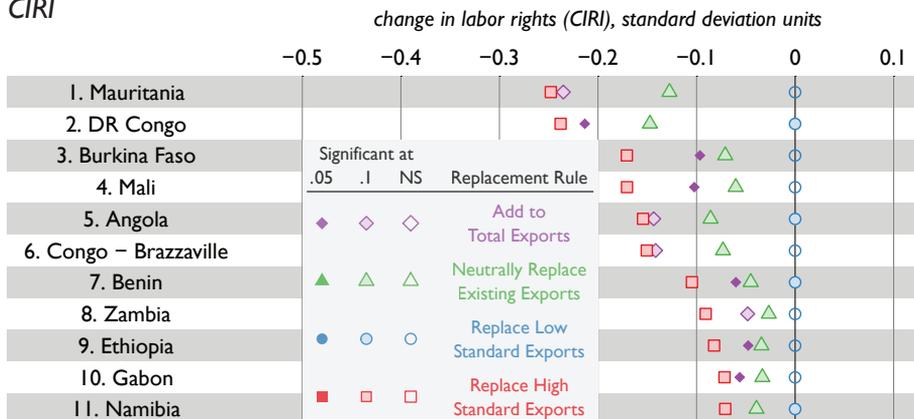


Figure 7. *Expected change in African labor standards, by country and replacement rule, under three alternative measures of labor standards.* Symbols indicate alternative replacement rule assumptions. Solid symbols indicate results with 95% CIs bounded away from zero. Countries are sorted by expected reduction in labor standards due to higher Chinese exports under the high replacement assumption. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated: for the top and middle panels, starting in 1995 and iterating through to 2002; for the bottom panel, starting in 2002 and iterating through to 2010, using the estimates provided by Models 2, 4, and 5, respectively from Tables 1 and 2. Only the last year of the simulation is shown.

To see whether the estimates for alternative measures suggest similar substantive effects of exports to China as the labor practice data considered in the last section, we turn again to simulation to sift through the different effects of China exports on each African country under each replacement rule. As before, we use in-sample counterfactuals to assess this impact. Full simulation results are available in the Appendix; here we concentrate on the predicted change in domestic labor rights given higher exports to China for the ten African countries with the largest predicted effects (Figure 7).

Across all three measures of labor standards, the substantive results are remarkably similar – despite using different data sources that are only weakly correlated,⁹ we repeatedly find the usual suspects, in essentially the same order, including eight countries that appear on every top 10 list. The top panel of Figure 7 shows, for completeness, the ten countries predicted to have the largest impact of increased exports to China using the fixed effects model of Mosley-Uno’s labor practice variable. As this variable is available only through 2002, these results show how much we would expect labor practice in 2002 to have changed if the 2009 level of exports prevailed at that time. These results are similar in substance and significance – as well as ordering of countries and replacement rules – to the results from Figure 6, which did not control for country fixed effects.

The middle panel of Figure 7 reports the ten countries whose labor laws are predicted to be most affected by China’s labor laws given the counterfactual that their 2002 ex-

⁹ Within the overlapping cases in across our models, the simple correlation (r) between Mosley and Uno’s law and practice measures was 0.37. The correlation between Mosley and Uno’s measure of labor laws and Cingranelli et al’s measure of worker rights was just 0.24, and the correlation between Mosley and Uno’s practice measure and Cingranelli et al’s measure of worker rights was just 0.19.

ports to China were as high as they were in 2009, after the boom in China-directed exports. At first, these results may be surprising: although the same countries appear in essentially the same order and are generally significant at the 0.1 level or better, the results for additive trade are both strongest and most statistically significant (due to a significant total trade effect), whereas export replacement effects seem muted compared to the labor practice models. The explanation is straightforward: while Mosley-Uno's measure of China's labor practice declined over this period, their measure of China's labor laws recorded a dubious but substantial increase through 2002. Taking these data at face value, the export context model of rights finds that exports to China are unlikely to replace substantially lower or higher rights partners (the neutral effect is close to zero). We confirmed separately that these results would have been similar to the top panel had China's labor laws declined in the same fashion as Chinese labor practices. This suggests the importance of using the more credible practice-based measures for interpreting the substantive impact of export context effects. It also hints at the complex effects that can emerge from export context models when both export compositions and labor standards in receiving countries are shifting at the same time, which we explore further in the Appendix.

Finally, we turn to the coarse but timely Cingranelli et al measure of worker rights (bottom panel of Figure 7). For these results, we can simulate how much lower each country's worker rights are expected to be in 2010 compared to the level they would have attained had exports to China persisted at their lower 2002 levels. Despite using different sources and a broader time period, the results are substantively similar – in magnitude as well as order of countries and of replacement rules – to the Mosley-Uno labor practice results and are generally significant at the 0.1 level.

While these models produce findings of varying precision, the substantive story is clear and consistent: export context correlates with domestic labor rights in African countries, but its net impact depends on the magnitude of change in exports to specific countries and the labor standards in former export destinations displaced by new exports. Through this combination of contextual and compositional effects, exports to China have only a small aggregate impact on labor standards in Africa as a whole, with noteworthy effects in a handful of “vulnerable” countries. Across a variety of periods and measures of labor standards, vulnerability consistently results from the combination of high China export dependence with the replacement of higher standard export destinations.

Conclusions and Caveats

The second generation of trade–regulation studies suggests domestic regulatory standards responds to “whom” a country exports, rather than “how much” it exports, which was the focus of the first generation. Drawing on compositional data techniques, this paper introduces a third generation of trade–regulation research, which suggests examining not only to whom a country exports, but also how the composition of markets in a country’s export basket reshuffles over time. This approach is particularly important in light of the structural change in the global economy represented by the rise of China as a major destination for exports of many countries.

Our paper has important implications for the study of trade–regulation. We show that absolute changes in exports can have important compositional effects. Activist groups criticize globalization and export orientation for many social ills, including labor rights. They recommend either scaling back free trade regimes or imposing tariffs on imports from developing countries. While the net effects of these policy prescriptions lie beyond the scope of this paper, we note one overlooked aspect by which these policies can undermine, at least in part, the goals these activists seek to achieve. Our approach suggests that a decline in export levels can influence labor practices in ways that are quite similar to the effects produced by growth in exports. Suppose the EU imposes a tariff which leads a developing country to redirect its exports to China. Given the current level of labor standards in the EU and China, the net effect would be to shift the export context of the developing country away from good labor practices, undermining labor standards in the exporting country. Suppose the WTO is abolished or diluted, and there is a new era of trade protectionism that leads to declining exports across countries. If the basic trade–regulation relationship holds, we may find falling labor standards in exporting countries if their exports to high standard countries fall at a faster rate than their exports to low standard countries. As these examples suggest, analysts should take care to account for compositional effects when interpreting any model of export effects and should recognize that differing export replacement assumptions and country-specific export contexts can turn California Effects into Shanghai Effects and *vice versa*.

While we have examined the possibility of a Shanghai Effect, our findings should be interpreted with several caveats. First and most important are data limitations. To understand how growing exports to China affect African countries in the present, we first used fine-grained labor practice data to turn back the clock to the late 1990s and early 2000s and ask whether we *would have seen* significant reductions in standards had trade

with China been as high then as it is now. Because it is possible that Chinese labor standards have improved since 2002, or that the relationship between domestic labor standards and export context has changed since then, we next turned to the best available recent labor rights data, which is notably coarser but collected through 2010. Triangulating between data sources with complementary strengths, we found consistent evidence that the net effect of China exports is moderate and concentrated in countries that export a great deal to China, but whether these effects are noteworthy or trivial depends entirely on whether exports to China displaced exports to countries with higher standards. However, there is a clear need for detailed measures of labor standards in recent years to confirm this result. Second, there is insufficient data to estimate a labor-standards effect of China exports that is allowed to be idiosyncratically different from exports to other jurisdictions, so we relied on a pooled estimate of the effects of labor context which we applied to the case of China exports. While more specific direct estimates are desirable, it is unlikely that panel models of trade will be able to estimate such country-specific parameters or similarly specific interaction effects precisely except in rare cases.

Just as second-generation trade–regulation scholarship opened new avenues of inquiry, third-generation attention to compositional effects raises new questions. First, we have examined bilateral export relationships while controlling for total inward FDI. Future work should try to estimate the role of bilateral exports (“trading up,” Vogel, 1995) and bilateral investment relationships (“investing up,” Prakash and Potoski 2007) separately to assess the relative contributions of both factors in shaping labor rights of the export country or the FDI host country. Indeed, the compositional approach we have advocated for studying trade–regulation relationships can be easily employed to study FDI–regulation relationships as well. Second, the approach we advocate may have differing effects depending on the sectoral composition of the export sector. While the fixed effects estimator we employ control for the effect of time invariant sectoral compositions, future research should work where possible with sectoral, bilateral export data to explore the dynamics of sectoral change (Janz, 2015). Finally, while our paper focuses on cross-national quantitative evidence of the effects of rising exports to China on African labor rights, the historically-informed country-specific simulations we use to interpret our results can serve as a bridge between broad, cross-national quantitative studies of the impact of trade and deeper qualitative investigations of particular cases. As we show, even a quite general statistical model typical of those used in the quantitative literature can predict very different effects of rising exports to China in different African cases if researchers take care in constructing counterfactuals informed

by the specific histories of each case. We hope our results – and the methodology we introduce – will lead to a richer conversation between qualitative and quantitative studies of the linkages between trade and labor rights.

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APPENDIX A.

*To supplement Christopher Adolph, Vanessa Quince, and Aseem Prakash, 2016,
“The Shanghai Effect: Do Exports to China Affect Labor Rights in Africa?”
World Development, <https://doi.org/10.1016/j.worlddev.2016.05.009>.*

This appendix presents full simulation results for three models discussed in the main paper: the fixed effects model of Mosley-Uno labor practice scores as a function of the labor practice of export destinations (Model 2 in Table 1), the pooled model of Mosley-Uno labor law scores as a function of the labor laws of export destinations (Model 4 in Table 2), and the pooled model of CIRI worker rights scores as a function of worker rights in export destinations (Model 5 in Table 2).

The appendix also contains descriptive statistics for the data used in each model, which differ mainly due to the varied availability of Mosley-Uno and CIRI scores by year and country: descriptives for Models 1, 3, and 4 are in Table A1; summaries for Model 2 are in Table A2; and summaries for Models 5 and 6 are in Table A3.

Simulation Results

For each model, we produce three figures that replicate the simulations we report for Model 1 in Figures 4, 5, and 6 in the main paper. For Models 2 and 4, the correspondence in our simulation procedure is exact; for Model 5, we make small adjustments to take advantage of the longer time series available for the CIRI worker rights data analyzed in that model.

Labor Practice with Fixed Effects (Model 2)

To better understand the results from the fixed effects specification of labor practice reported as Model 2 in Table 1, we turn to simulation. As before, we start with an in-sample simulation from 1995–2002 of each of our 43 fully-observed countries. Each plot in Figure A1 shows the expected change in labor practice in response to an increase in exports to China, relative to the expected labor practice under historical export patterns in each country over time. Examining each plot shows us how export-context effects vary across countries under different counterfactual export compositions and replacement rules.

The fixed effects simulations in Figure A1 are remarkably similar to the pooled simulations in Figure 4. The effects of export context vary widely in response to compositional assumptions, both in terms of the average effect and its variation across countries,

APPENDIX TO THE SHANGHAI EFFECT

Country-Specific In-Sample

Expected Change in

Labor Practices Given...

I. CHANGE IN CHINA EXPORTS



Figure A1. In-sample counterfactual change in African labor practice (Mosley-Uno) under higher levels of China exports, by country, year, and replacement rule, controlling for country fixed effects. Lines represent the expected difference in each observed year between historical and counterfactual labor standards in practice assuming (1) China exports were elevated as described for the given column of plots and (2) new exports to China replaced other export destinations as described for that row of plots. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 1995 and iterating through to 2002, using the estimates provided by Model 2 from Table 1. See Figure A3 for more country-level results.

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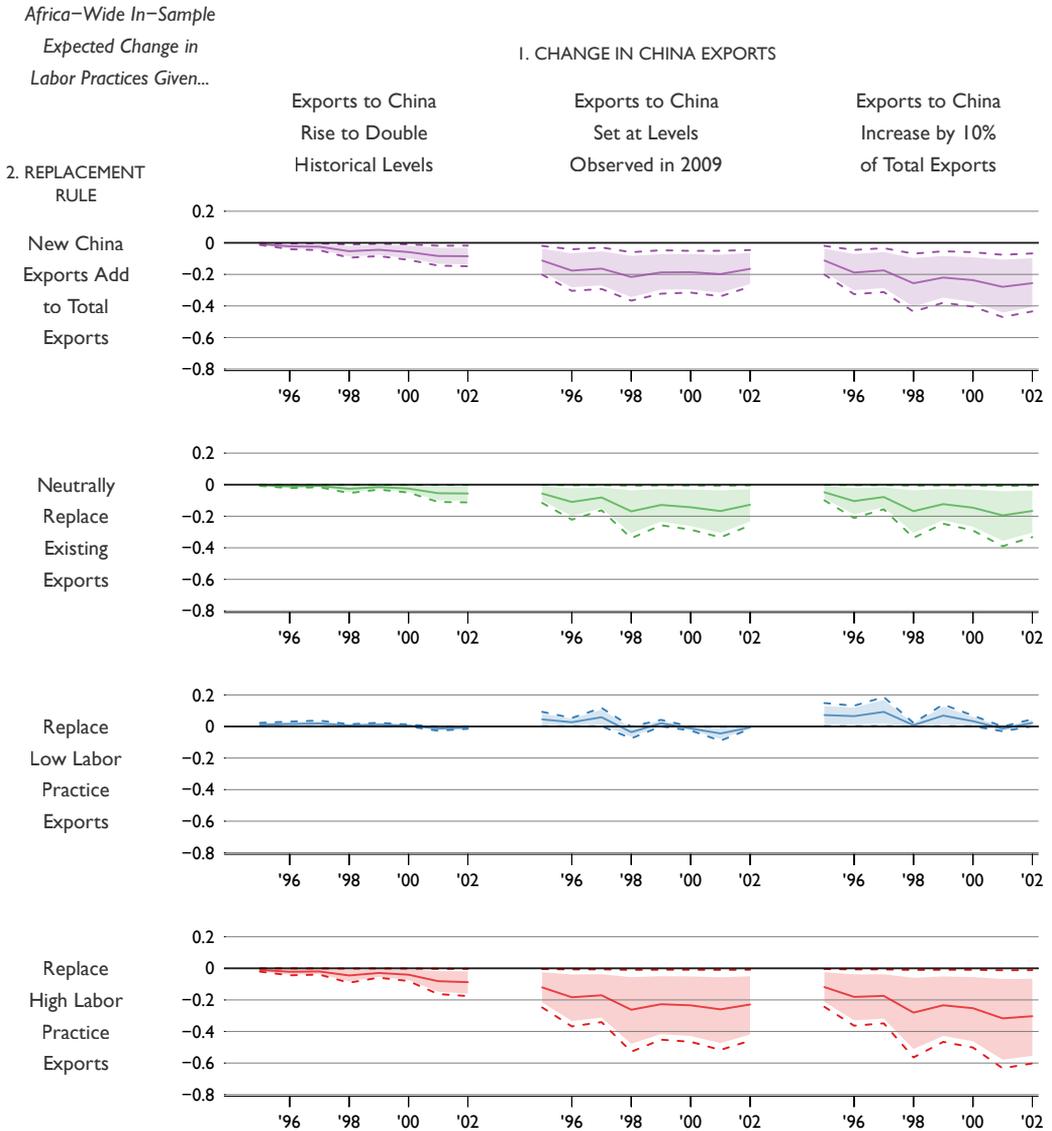
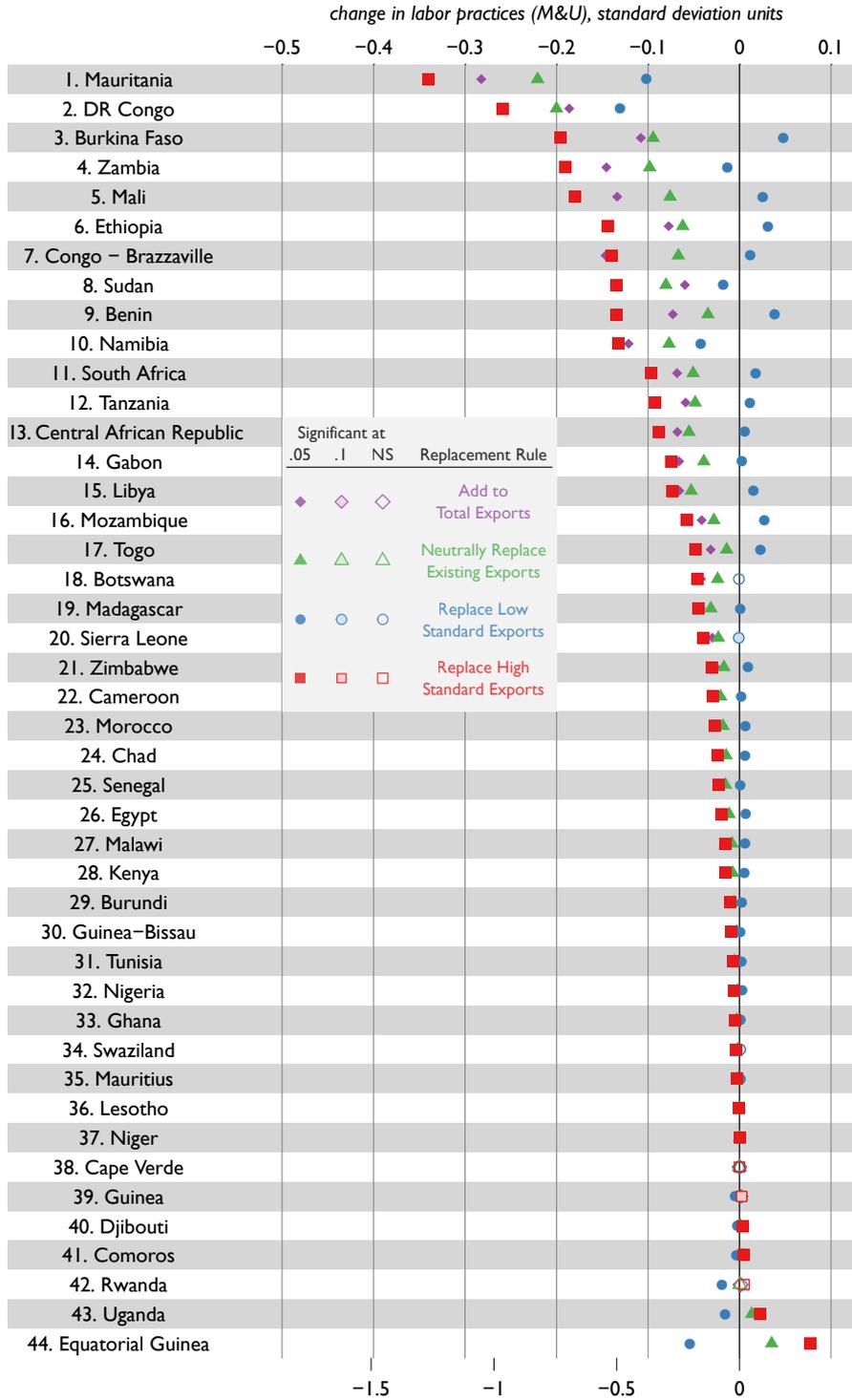


Figure A2. Continent-wide weighted average in-sample counterfactual change in African labor practice (Mosley-Uno) under higher levels of China exports, by year and replacement rule, controlling for country fixed effects. Lines represent the population-weighted average of the country-level expected differences shown in Figure A1. Dashed lines are 90% CIs and shaded regions are 95% CIs; these include estimation uncertainty from the parameters of Model 2. See Figure A1 for further details.

APPENDIX TO THE SHANGHAI EFFECT



Change in Labor Practices, original Mosley & Uno scale

Figure A3. *Expected change in African labor practice (Mosley-Uno) if 2009 levels of exports to China had prevailed in 2002, by country and replacement rule, controlling for country fixed effects. Symbols indicate alternative replacement rule assumptions. Solid (shaded) symbols indicate results with 95% (90%) CIs bounded away from zero. Countries are sorted by expected reduction in labor standards under the high replacement assumption. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 1995 and iterating through to 2002 (only the last year of the simulation is shown here), using the estimates provided by Model 2 from Table 1.*

with approximately the same effect sizes in each country as before. Roughly speaking, expanded exports to China are associated with larger reductions in the practice of domestic labor standards when Chinese exports displace exports to countries with high labor standards, moderate reductions when exports to China neutrally replace other exports or simply add to total exports, and essentially no reduction when Chinese exports displace export destinations with low standards.

Figure A2 confirms that the Africa-wide aggregate relationship between Chinese exports and labor practice remains the same under each combination of a hypothetical change in Chinese exports with a replacement rule: side-by-side, the fixed effects results are almost identical in substantive and statistical significance to the pooled results in Figure 5 in the main text. Finally, Figure A3 (excerpted as the top panel of Figure 7 in the main text) reveals that at the country level, the relationship between exports and labor standards remains virtually identical under each replacement rule compared to the pooled results, with the ordering of countries from the largest to smallest effect changing only slightly. Taken together, these results provide reassurance that the findings in the main text are not confounded with unmeasured country characteristics like natural endowments, colonial history, basic demography, and time-invariant formal and informal institutions.

Labor Laws

Mosley and Uno's measure of labor standards as codified in law forms the basis for Model 4 in Table 2. As shown in Figure 1 in the main paper, China's labor laws are coded by Mosley and Uno as *rising* through 2002. We doubt this reflects a genuine improvement in labor standards in China, especially given the simultaneous decline in Mosley and Uno's measure of labor practice. As noted in the paper, in general Mosley and Uno's measures of labor laws and labor practices are only weakly correlated.

Nevertheless, Model 4 finds a borderline significant association between domestic labor laws and the export context of labor laws. As we noted in our discussion of Figure 7 in the main text, simulations from this model are only significant at the 0.1 level, excepting additive effects, which are significant at the 0.05 level (to see the complete country results excerpted in Figure 7, see Figure A6 in this appendix). The reason for this seeming discrepancy with our labor practice models follows a compositional logic: when a developing country sends more exports to a destination with low standards *at the same time* that the destination raises its standards, the net effect on domestic labor standards of the change in export volume and the change in labor standards abroad depends on (1) the rule by which new exports displace the sender's existing exports and (2) the mix of labor standards among the sender's other export partners.

The middle column of Figure A4 provides an illustration: hypothetically raising exports to China in 1995 leads to predictions of lower labor rights in that year, because China's labor laws hit a low point in 1995 on Mosley and Uno's scale. But iterating forward from 1995, the simulations predict improving domestic labor rights in countries with high China export salience as the negative weight of Chinese labor laws gradually lightens as those laws improve. Figure A5 shows results aggregated for all African countries and makes it clear that the net effects of China's changing labor laws on African exporters depend not just on the amount of exports newly sent to China but on the export destinations replaced. Under neutral replacement, domestic labor standards in an African country that exports more to China just as China "improves" its labor laws are predicted to follow a U-shaped curve over time, because the improvement in Chinese standards gradually reverses the (initially-negative) impact of higher export volume. But if trade with China replaces low standard export destinations, the effect is a more dramatic J-curve, because under this replacement rule even a small improvement in China's standards can lift the overall export context and quickly turn the impact of growing exports to China into a positive one. Finally, when exports to China replace exports to high standard countries, we see an L-curve, because in this case rising Chinese labor standards can do no more than gradually limit the harm caused by growing export volume, unless China's standards rise to the very high levels of the destinations replaced under this rule.

Even though the data employed in this example should be treated with caution, the results are instructive of the compositional logic of export context models. Suppose an exporter expands its share of exports to a country with low but genuinely rising labor standards. Then, depending on the replacement rule and *ex ante* portfolio of export destinations, the two trends of rising exports and rising standards might follow U-,

APPENDIX TO THE SHANGHAI EFFECT

Country-Specific In-Sample

Expected Change in
Labor Laws Given...

I. CHANGE IN CHINA EXPORTS



Figure A4. In-sample counterfactual change in African labor laws (Mosley-Uno) under higher levels of China exports, by country, year, and replacement rule. Lines represent the expected difference in each observed year between historical and counterfactual labor standards in practice assuming (1) China exports were elevated as described for the given column of plots and (2) new exports to China replaced other export destinations as described for that row of plots. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 1995 and iterating through to 2002, using the estimates provided by Model 4 from Table 2. See Figure A6 for more country-level results.

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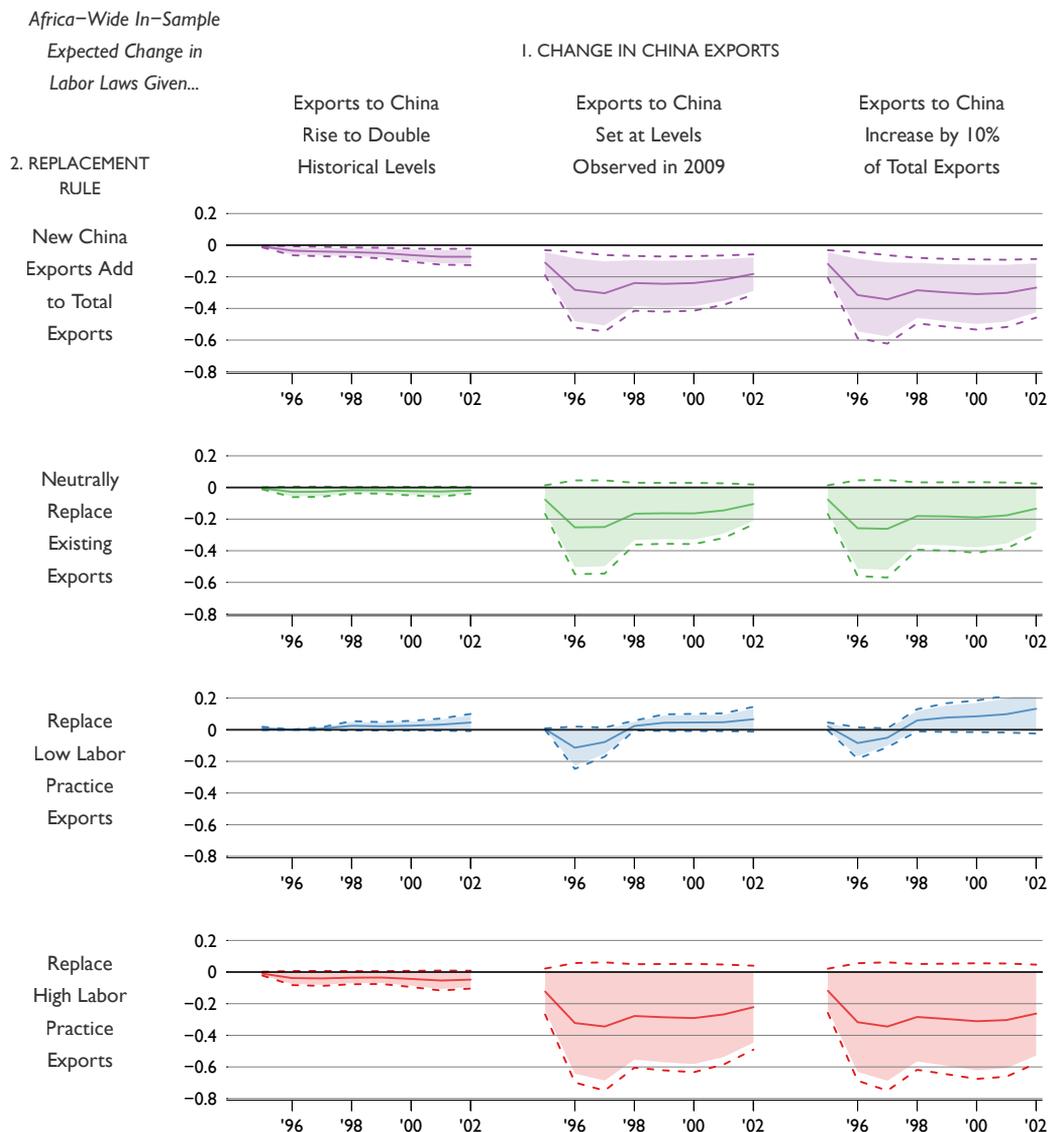


Figure A5. Continent-wide weighted average in-sample counterfactual change in African labor laws (Mosley-Uno) under higher levels of China exports, by year and replacement rule. Lines represent the population-weighted average of the country-level expected differences shown in Figure A4. Dashed lines are 90% CIs and shaded regions are 95% CIs; these include estimation uncertainty from the parameters of Model 4. See Figure A4 for further details.

APPENDIX TO THE SHANGHAI EFFECT

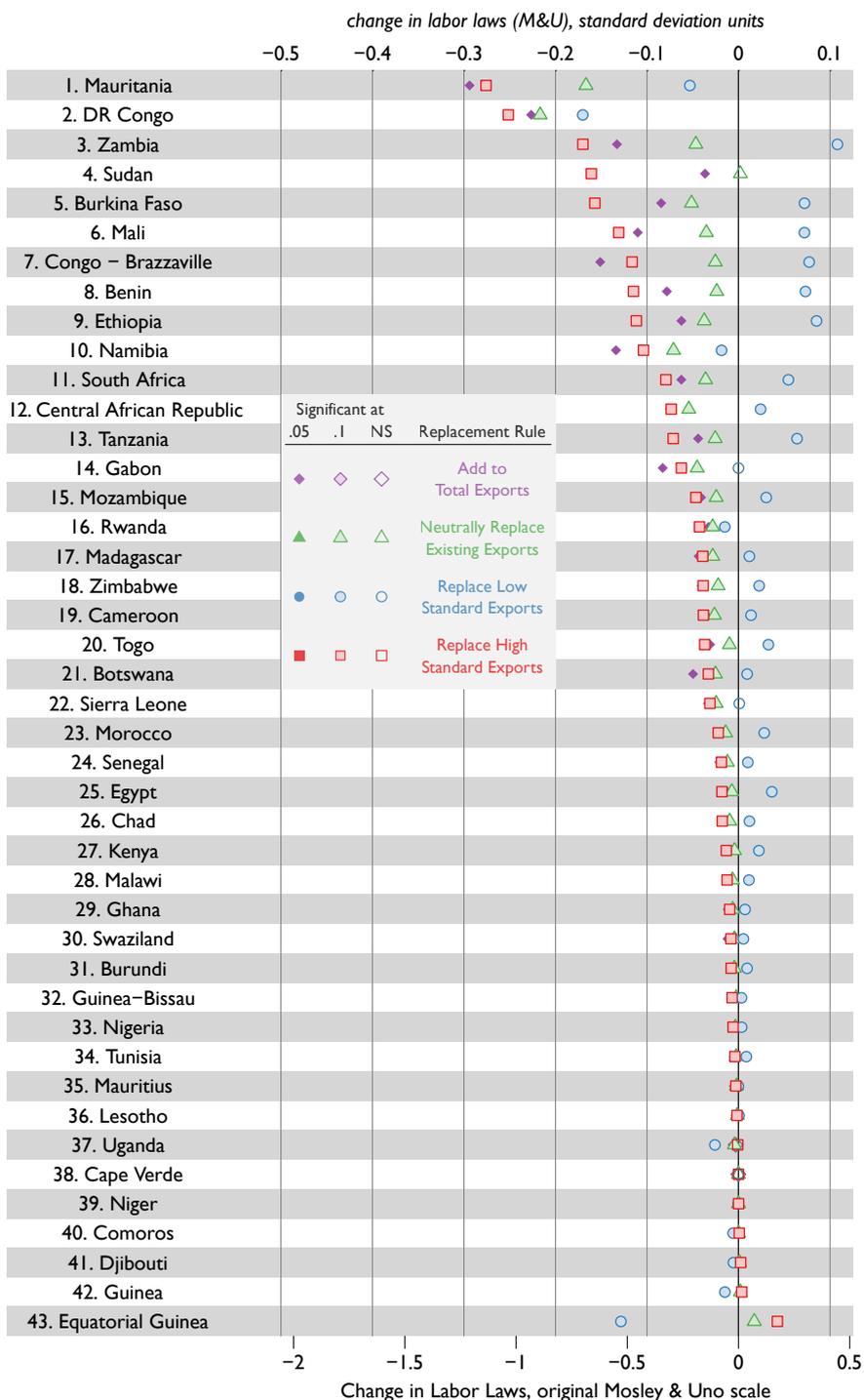


Figure A6. *Expected change in African labor laws (Mosley-Uno) if 2009 levels of exports to China had prevailed in 2002, by country and replacement rule.* Symbols indicate alternative replacement rule assumptions. Solid (shaded) symbols indicate results with 95% (90%) CIs bounded away from zero. Countries are sorted by expected reduction in labor standards under the high replacement assumption. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 1995 and iterating through to 2002 (only the last year of the simulation is shown here), using the estimates provided by Model 4 from Table 2.

J-, or L-shaped curves. That is, even if the underlying regression model contains but a single linear export context term, counterfactual scenarios involving this term can produce predictions of time-varying and even non-monotonic changes in domestic labor standards as the result of a monotonic trend in exports by the sending country coupled with another monotonic trend in recipient labor standards.

Worker Rights

Finally, we turn to Model 4 of Table 2, which uses Cingraneli et al's three-point scale of worker rights as both the outcome variable and the basis for the export context covariate. The advantage of the CIRI worker rights score is availability through 2010; the disadvantage is relative coarseness (e.g., China's score does not vary from the lowest of the three CIRI levels throughout the period 1995–2002).

As noted in the paper, the results for the CIRI worker rights measure are similar in substance to the labor practice results, despite the low correlation of these two measures with each other. The main difference is one easily explained from a compositional perspective. The second column of results in Figures A6 and A7 reports a scenario that supposes exports to China froze at 2002 levels in that year, then iterates the model of worker rights through 2010. In this scenario – which is also the one reported in Figure A7 – we find that the third replacement rule predicts, both for nearly every country and for Africa as a whole, that there will be no difference whatsoever in domestic labor standards compared to the actual historical record. This illustrates the logic of export replacement: because China is coded at the bottom of CIRI's scale in every period, replacing other low standard countries with China is unlikely to change the overall export context of an exporter unless the increase in exports to China is greater than the previous volume of exports to all low standard countries (a rare occurrence, to be sure). From another perspective, this non-result is a direct consequence of the coarse-

APPENDIX TO THE SHANGHAI EFFECT

Country-Specific In-Sample
Expected Change in
Labor Rights Given...

I. CHANGE IN CHINA EXPORTS

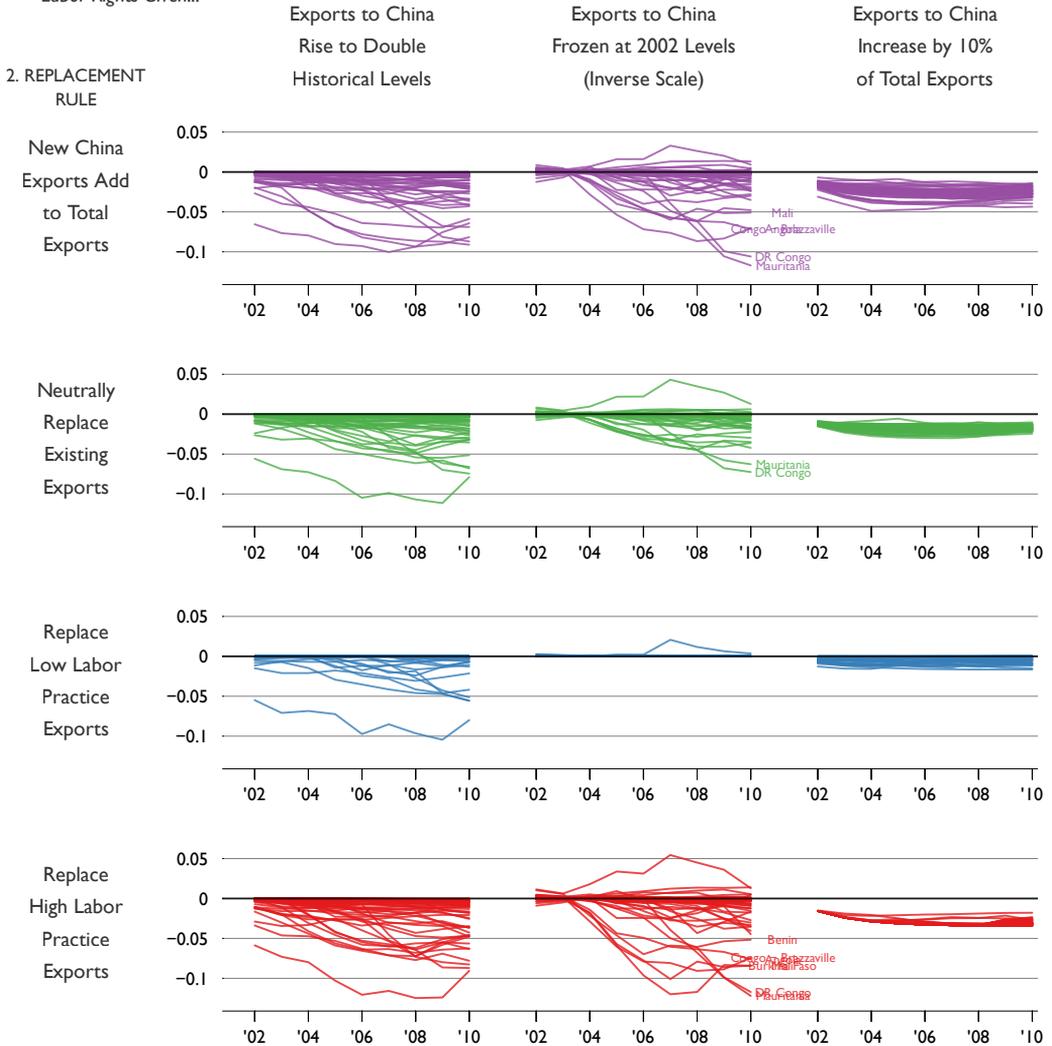


Figure A7. In-sample counterfactual change in African worker rights (Cingranelli et al) under higher levels of China exports, by country, year, and replacement rule. Lines represent the expected difference in each observed year between historical and counterfactual labor standards in practice assuming (1) China exports were elevated as described for the given column of plots and (2) new exports to China replaced other export destinations as described for that row of plots. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 2002 and iterating through to 2010, using the estimates provided by Model 5 from Table 2. See Figure A9 for more country-level results.

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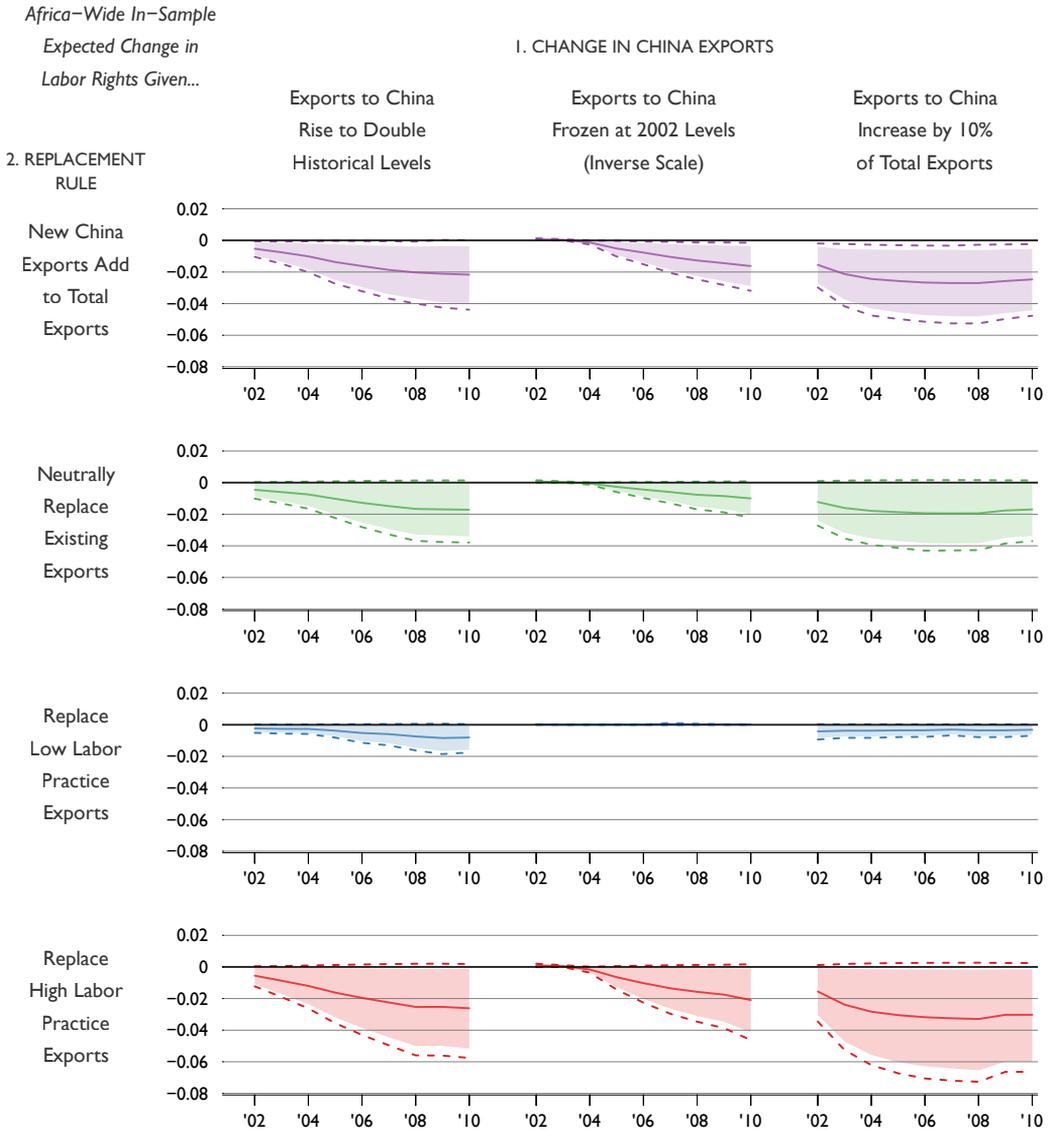


Figure A8. Continent-wide weighted average in-sample counterfactual change in African worker rights (Cingranelli et al) under higher levels of China exports, by year and replacement rule. Lines represent the population-weighted average of the country-level expected differences shown in Figure A7. Dashed lines are 90% CIs and shaded regions are 95% CIs; these include estimation uncertainty from the parameters of Model 5. See Figure A7 for further details.

APPENDIX TO THE SHANGHAI EFFECT

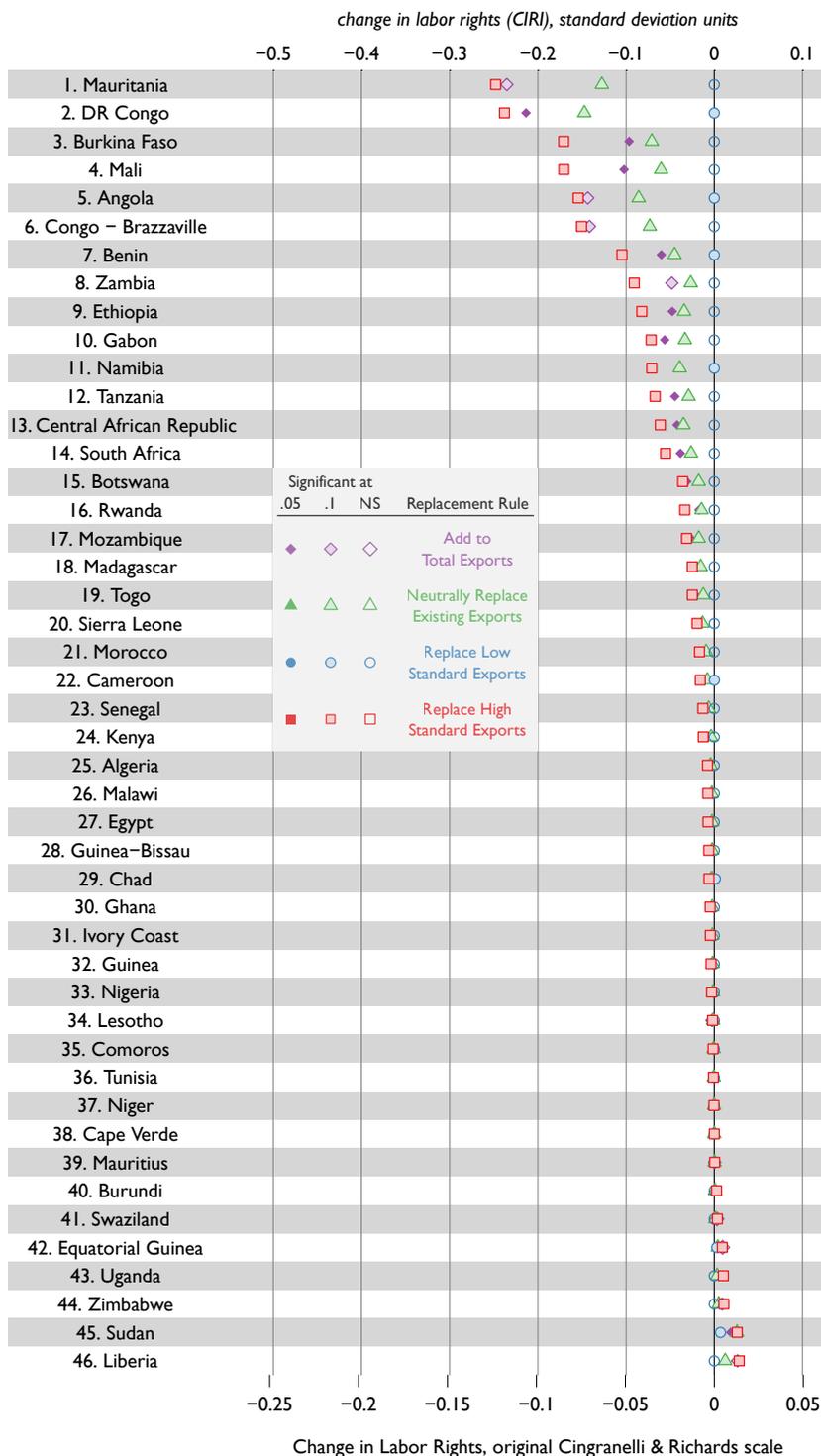


Figure A9. *Estimated reduction in African worker rights (Cingranelli et al) associated with 2010 levels of exports to China compared to 2002, by country and replacement rule. Symbols indicate alternative replacement rule assumptions. Solid (shaded) symbols indicate results with 95% (90%) CIs bounded away from zero. Countries are sorted by expected reduction in labor standards under the high replacement assumption. All other covariates are held at their historically observed levels by country-year. Counterfactuals are dynamically simulated, starting in 2002 and iterating through to 2010 (only the last year of the simulation is shown here), using the estimates provided by Model 5 from Table 2.*

ness of the CIRI measure. While providing support for our general claims regarding China's influence on African labor standards, these results also show the importance of more precise measures of export context for accurately estimating the country-specific consequences of trade on domestic regulation.

Descriptive Statistics

Table A1. Descriptive statistics of variables included in Models 1, 3, and 4.

Variable	Mean	Std Dev	Min	Percentiles			
				25th	50th	75th	Max
Labor Practice _t	22.32	4.14	6.00	20.00	23.00	26.00	27.50
Labor Practice _{t-1}	22.56	4.10	6.00	20.50	24.00	26.00	27.50
Overall Export Context (Practice) _{t-1}	23.90	1.80	15.86	22.94	24.11	25.27	27.44
China Export Context (Practice) _{t-1}	0.26	0.66	0.00	0.00	0.05	0.21	7.80
Other Export Context (Practice) _{t-1}	23.65	2.05	11.04	22.62	23.91	25.16	27.44
Labor Laws _t	23.71	4.11	6.50	21.75	25.00	27.00	28.50
Labor Laws _{t-1}	23.92	4.03	6.50	22.00	25.00	27.00	28.50
Export Context (Laws) _{t-1}	25.48	1.67	18.77	24.57	25.79	26.73	28.31
Trade/GDP _{t-1}	0.66	0.34	0.13	0.43	0.55	0.83	1.96
FDI/GDP _{t-1}	0.02	0.04	-0.29	0.00	0.01	0.02	0.41
Hard PTA _{t-1}	0.04	0.18	0.00	0.00	0.00	0.00	1.00
Soft PTA _{t-1}	0.39	0.49	0.00	0.00	0.00	1.00	1.00
GDP per capita (2005 \$k) _{t-1}	1.12	1.45	0.10	0.32	0.52	1.23	7.71
Polity _{t-1}	-2.37	5.67	-10.00	-7.00	-4.00	1.00	10.00
Population (millions) _{t-1}	13.80	19.34	0.31	1.92	7.73	15.63	126.00
Civil War _{t-1}	0.17	0.37	0.00	0.00	0.00	0.00	1.00

Table A2. Descriptive statistics of variables included in Model 2.

Variable	Mean	Std Dev	Min	Percentiles			Max
				25th	50th	75th	
Labor Practice _t	22.29	4.20	5.50	20.13	23.00	26.00	27.50
Labor Practice _{t-1}	22.53	4.19	5.50	20.50	24.00	26.00	27.50
Overall Export Context (Practice) _{t-1}	23.91	1.83	15.86	22.94	24.13	25.31	27.37
Trade/GDP _{t-1}	0.70	0.50	0.11	0.43	0.56	0.82	5.32
FDI/GDP _{t-1}	0.02	0.09	-0.29	0.00	0.01	0.02	1.62
Hard PTA _{t-1}	0.03	0.18	0.00	0.00	0.00	0.00	1.00
Soft PTA _{t-1}	0.37	0.48	0.00	0.00	0.00	1.00	1.00
Polity _{t-1}	-2.17	5.71	-10.00	-7.00	-4.00	2.00	10.00
Civil War _{t-1}	0.17	0.38	0.00	0.00	0.00	0.00	1.00

Table A3. Descriptive statistics of variables included in Models 5 and 6.

Variable	Mean	Std Dev	Min	Percentiles			Max
				25th	50th	75th	
Worker Rights _t	1.75	0.64	1.00	1.00	2.00	2.00	3.00
Worker Rights _{t-1}	1.76	0.65	1.00	1.00	2.00	2.00	3.00
Overall Export Context (Rights) _{t-1}	2.31	0.36	1.06	2.07	2.35	2.60	2.99
China Export Context (Rights) _{t-1}	0.04	0.08	0.00	0.00	0.01	0.03	0.60
Other Export Context (Rights) _{t-1}	2.28	0.41	0.63	2.04	2.34	2.59	2.99
Trade/GDP _{t-1}	0.74	0.47	0.11	0.46	0.62	0.88	5.32
FDI/GDP _{t-1}	0.03	0.09	-0.29	0.00	0.01	0.03	1.62
Hard PTA _{t-1}	0.05	0.23	0.00	0.00	0.00	0.00	1.00
Soft PTA _{t-1}	0.39	0.49	0.00	0.00	0.00	1.00	1.00
GDP per capita (\$k) _{t-1}	1.30	1.77	0.10	0.34	0.56	1.43	13.52
Polity _{t-1}	-0.97	5.89	-10.00	-6.00	-3.00	5.00	10.00
Population (millions) _{t-1}	15.30	21.57	0.31	2.14	8.75	17.66	155.38
Civil War _{t-1}	0.15	0.36	0.00	0.00	0.00	0.00	1.00