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Cite this: *Environ. Sci.: Adv.*, 2024, 3, 1317

Advancing sustainability through supply chain legislation? A policy trilemma

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The European Union and governments of various economies in the world are currently developing supply chain legislation for businesses, aiming to protect the environment and human rights in supply chains. These laws regulate firms active on home markets in these countries, but in terms of environmental and human rights risks also apply to global supply chains. Legislative initiatives assume that firms have the ability to influence many suppliers and their conditions of production abroad. Illustrated by the urgent case of garment production exported to Europe, we conclude that current import–export relations could limit the scope and impact of such supply chain legislation. If patterns as visible in the garment sector hold more broadly, policymakers that are ambitious about the impact of supply chain legislation on environment and human rights face a policy trilemma: they must sacrifice one out of three current design features of such legislation: designing legislation unilaterally for their home markets, letting regulation apply to supply chains across the world, or giving firms the ability to freely choose their suppliers. We discuss the different combinations of design options that could advance sustainability in supply chains.

Received 12th February 2024
Accepted 1st August 2024

DOI: 10.1039/d4va00048j

rsc.li/esadvances

Environmental significance

The paper discusses the recent phenomenon of supply chain legislation as a tool to advance environmental sustainability goals, such as limiting CO₂ emissions, reducing soil degradation and limiting water pollution and deforestation. By mandating action from buying firms in their global supply chains, initiatives such as the EU Corporate Sustainability Directive, the French Vigilance Law and the German Supply Chain Law address global environmental issues. We argue however with the use of recent economic data that this policy instrument is based on a questionable assumption (that buying firms would generally be able to influence their suppliers). We then go on to show that if policy-makers would base their policies on economic realities, and would genuinely seek advances in achieving SDGs through this instrument, they would have to re-tool this instrument, and sacrifice at least one of its three perceived core qualities. As a result, three different models of governing supply chains to achieve environmental sustainability goals arise, that could match with current structures of supply. The paper illustrates this point using data from a high-risk industry in terms of environmental risks (the garment industry), both in terms of its impact on environmental sustainability in producing areas, and in terms of the threat of climate change to the livelihoods of those involved in this industry.

Introduction

Governments of various countries are currently implementing, developing or considering business regulation that would require firms to act towards due diligence in their supply chains when addressing instances of environmental degradation and violation of human rights. Such regulations are in place in France (passed in 2017), Germany (2022), Switzerland (2021) and Norway (2021), and are at the time of writing being considered in Australia, Canada, Austria, Belgium and the Netherlands amongst others. Meanwhile, a European Union (EU) directive, called the Corporate Sustainability Due Diligence Directive (CSDDD) is at the time of writing being voted for.¹

These forms of supply chain governance cover domestic firms or firms active on home markets of these governments and address risks in the global supply chains of these firms. In terms of issue areas, the laws and proposals vary, from addressing environmental sustainability, worker rights and human rights in tandem (such as the EU directive and the French law), to only worker and human rights (in Norway), to human rights and worker rights, with a more circumscribed understanding of environmental risks (in Germany).² The laws describe a duty of firms to protect the environment and/or human rights at their suppliers across the world, and are based on the assumption that firms from said countries have influence on conditions at suppliers located in other countries.

Is that assumption realistic? Listening to politicians, one might conclude that this is the case. Illustrative is a comment of European Parliament representative Lara Wolters, rapporteur for the European Parliament in the design of the CSDDD, who

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mentioned that “European firms should use the leverage they have” to affect progressive change in supply chains.³

Reviewing the literature however, we cannot be so sure. Academic studies on supply chain laws so far do not empirically address this question in detail.^{4–8} Results from global value chain studies create some doubt about this assumption^{9,10}—these studies however do not analyze the question systematically with reference to these new and emerging laws. As a first step of this paper, we therefore investigate this issue.

Based on a review of an urgent industry case in terms of environmental and human rights risks, garment production, and focusing on currently the largest market considering such supply chain regulation (the European Union), we scrutinize legislator's and policymaker's optimism about buying countries' leverage over supply chains. Our review of trade data indicates that for some crucial garments exporting countries, EU member countries collectively nor individually are major buyers of goods. It is therefore questionable whether EU laws would be able to determine the shape of production and production processes in these countries, including the issue of whether such products are produced “fairly” and “sustainably”.

For the garment industry, it is therefore likely that the legislators developing supply chain laws to address environmental sustainability and/or human rights would find that firms in their markets often only cover a small subset of suppliers active in important garment-exporting countries with risk profiles. In addition, the question would be how much leverage these firms would have over these suppliers, if they share a buying relationship (as is common in the garment industry) with firms from countries that do not have supply chain legislation in place.

This leads us to the second analytical step in our argument. If trends as visible in the garment sector hold more broadly, as we suspect they do, and if policy-makers are still serious about building supply chain legislation for the purpose of protecting people and planet, we argue that policymakers such as Wolters face, in economist Dani Rodrik's terms, a policy trilemma if they want effective regulation. Building on Rodrik's¹¹ seminal work on globalization and nation states, we outline how policy-makers interested in designing supply chain regulation to address sustainability issues, or updating and revising existing regulations, and wanting to respond to the challenges of limited political leverage through trade, must sacrifice one out of three current design features of such legislation: (a) designing legislation unilaterally for firms active on their home markets; (b) letting regulation apply to supply chains across the world; (c) or giving firms the ability to freely choose their suppliers.

We discuss the different combinations of design options that result from each time one of these features is dropped and wedding the two remaining features. We then describe what opportunities and challenges arise for these options.

This paper is organized as follows: the next section discusses how current academic, policy-making and grey literature addresses the promise and challenges of supply chain governance, emphasizes how current realities of supply chains are an important but a relatively neglected factor in such debates and presents how this paper seeks to redress this gap. The section

after that presents the approach and methodology to the study, followed by a section that explores trade data to unearth the promise of European supply chain governance using garments as a crucial case. The section after this develops the idea of a supply chain governance policy trilemma as a heuristic for academic and policy debates and presents the ideal-typical options flowing from it. A final section concludes.

In sum, the paper will assess the leverage of supply chain legislating countries over producing countries by focusing on the EU as a legislator and the garment industry as an important sector case, using available trade data. It finds that this leverage varies across export economies. This insight informs the development of a framework for discussing design options for sustainable supply chain laws, that deals with the possibility of limited leverage of buying economies over producing economies.

Research gap: the promise of supply chain legislation and the challenge of polycentric trade

Literature on supply chain laws recognizes that most contemporary supply chain laws and initiatives have been inspired by the adoption of the United Nations Guiding Principles for Business and Human Rights in 2011.^{4,6,12} These soft-law principles defined not only what the UN community expected from firms, but also from its state members in terms of promoting corporate “due diligence” in their supply chains. The due diligence model has also been adopted for environmental sustainability issues, with regulation for deforestation, and in particular illegal logging practices, leading the way.¹³ This brief literature review summarizes literature focusing on the development of supply chain laws, their relationship to previously existing voluntary efforts to protect human rights and the environment, and the early detectable effects of these laws, signaling how more work needs to be done evaluating how relationships between buyers and producers in supply chains may affect the law's effects.

The development of governmental supply chain legislation was precipitated by various political actors who felt that the hitherto voluntary initiatives by firms to protect the environment, labor and human rights in their supply chains were insufficient.⁵ Studies have indeed scrutinized soft law approaches of intergovernmental organizations that embrace the voluntary corporate social responsibility agendas of firms as instruments for advancing sustainable development and human rights in supply chains, such as for instance through the UN Global Compact and the UN Forum on sustainability standards.^{14,15} Literature on transnational sustainability governance similarly shows structural limitations to these voluntary instruments: uneven industrial uptake of standards hampers effective remediation;¹⁶ voluntary monitoring instruments are too often unable to capture significant risks;¹⁷ many risks in supply chains are affected by national institutions at the point of production that CSR policies cannot influence;¹³ and



voluntary instruments often do not address buying firm decisions that aggravate risks.¹⁸

Government initiatives have proliferated that use transparency and/or corporate due diligence requirements for responsible business conduct in global supply chains. Some of these legislations are issue-specific (*e.g.* the UK Modern Slavery Act and the Dutch Child Labor Act), some are more generally addressing responsible conduct across environmental sustainability and human rights categories (*e.g.* the French Vigilance Law). As noted, laws inspired by the UN Guiding Principles are discussed or have been concluded in amongst others France, Germany, Switzerland, Norway, Switzerland, Austria, Belgium and the Netherlands.

The first generation of academic studies into supply chain laws mainly delves into the legal and administrative features of this legislation, in addition to trying to identify initial effects on buying firms.^{2,5,7} These studies cover important design issues, such as to what degree laws make companies liable for cases of pollution, degradation or human rights breaches,⁸ what are the enforcement capacities of government,⁵ how specific are the duties of corporations,⁷ which companies ought to be covered by the law,⁵ and to what degree would non-state actors and activities be involved in implementation and enforcement of the law.²

While these are all highly valuable inroads into understanding the promise of supply-chain legislation, few if any of these studies consider the character of supply chains covered by legislation, nor its implications for the effects that legislation are likely to have at suppliers and in countries exporting to the market being regulated by such law.

To get more insight into this question, we first review studies of voluntary forms of transnational sustainability governance. Through an analysis of the effectiveness of business codes of conduct and voluntary sustainability standard systems, scholars have emphasized how the structure of supply chains may work as enabler and constraint for effective governance.^{18,19} These studies point at (sub-)sectors where the leverage of large buying firms on suppliers could likely be limited. This limited leverage indicates that the viability of the voluntary supply chain governance model of advancing sustainable development that the authors study, is in question.

These studies mirror insights from global value chain studies, that claim that today's trade order has various core regions. The significance of trade between in particular countries from the so-called Global South is increasing in volume and relative significance for agricultural commodities and manufactured goods.^{10,20} In an era of polycentric trade, goods are often destined for a multitude of markets across the globe, and consumer and policy-making concerns about the "sustainability" or "fairness" of production may vary in form and shape according to the specific final market. These studies show that one should not assume that European, Australian or North American-based firms are leading the organization of production in industrial and agricultural supply chains. The global value chains and voluntary sustainability governance literatures so far however do not connect these insights systematically to the functioning and potential of supply chain

laws. Hence our effort here to make such connections and address this gap. This will be done in two steps. First, we empirically assess a supply chain legislator's trade influence over exporting countries. Second, we develop a heuristic for discussing what design issues arise for supply chain legislators if they are faced with a situation where trade relations indicate limited leverage over producers.

Approach and methodology

The focus of supply chain governance laws is to protect human rights, labor rights and the environment, but labor force and environmental impact data in value chains are notoriously unreliable.²¹ As a consequence, we choose trade flows between countries as a useful proxy measure for the scale of trade partner influence on labor markets and environmental impacts in their trade partner's economy, where we assume that the importing country will have supply chain legislative ambitions that lead it to address production conditions in exporting countries. Trade flows empirically capture two issues that concern us here: the geography of global supply chains, *i.e.* the location of buyers, sellers and their mutual relations; and the possible leverage that economic actors from one region of the globe may have over the other given the significance of their buying to another region's selling activities. While trade flows are an imperfect measure of influence, and their accuracy has been criticized,²² they remain the best available option for illustrating in broad terms the relations between countries within supply chains that come to be governed by supply chain laws or other policy initiatives aimed at addressing environmental sustainability, worker rights or human rights issues.²³

For the purpose of illustration, as an industry case we choose garment production, because of its obvious manifold environmental, social and human rights risks, including water pollution²⁴ (microplastic) waste²⁵ CO₂ emissions in production,²⁶ child labor²⁷ repression of workers that want to unionize,²⁸ and wages below living income level.²⁹ As a result, the garment industry is targeted in all well-known supply chain laws and legislative initiatives, and/or treated as a high-risk sector.

We analyze garment trade data drawn from Harvard Growth Lab's Atlas of Economic Complexity (2023). The Atlas builds on data reported to UN Comtrade, which is the central international repository for trade data, and allows users to map trade flows by product, country of export and country of import. We chose the Atlas version of the data in an attempt to minimize the data issues noted by Linsi and Mügge.²² The Atlas takes steps to correct inconsistencies in reported data using the Bustos-Yildirim method to balance inconsistent reporting between trade partners, and to create estimates where data is missing. While trade data should still be treated as an estimate, for the purposes of this analysis we believe it is reliable enough to illustrate our point.

Trade flows were calculated by combining harmonized system categories of knit and non-knit clothing, footwear, headwear and accessories into one "garments" category, which was then extracted from the Atlas dataset. In terms of importing countries, we focus on the EU, as the largest market with



a supply chain law in development. For exports, we look at the group of 30 largest garment exporters, which account for more than 90% of global exports. We use data from 2019, as these were the latest available data at the time of writing, and, from the perspective of the sudden impact of the COVID-19 pandemic in 2020, represent a more stable benchmark for assessing industry trends. We omit the US and EU as garments exporters in the analysis, because supply chain governance focuses mostly on non-Atlantic exporting countries and the size of the contribution of EU member countries is likely to be inflated due to intra-EU trade distorting of the values of EU trade statistics. The insights of our empirical investigation lead us to theorize ways ahead in discussing supply chain law's potential based on the work by Dani Rodrik,¹¹ from the section "The policy trilemma" onward.

Polycentric trade in garments production

If it is questionable whether countries and regions where supply chain legislations are developed or considered, such as in Europe, host major buyers that effectively determine the shape of global supply chains, one may wonder whether the effort of regulating such firms to advance environmental and human rights causes is based on the right assumptions about global trade.

International garment exports are dominated by countries in Asia, Africa and the Americas; Fig. 1 shows the distribution of export production across the 30 top exporters and how import

relations are distributed across these 30. At the left side are countries with exports almost entirely destined for the EU. At the right are countries exporting primarily to the US. In the middle, amongst others China, Vietnam and Thailand have diversified export destinations, while including significant amounts of exports to other countries.

Beyond garments, how important are importers to these top 30 countries? Fig. 2 depicts volume of exports for all products, as it reveals a different dimension of possible trade dependence between exporters and importers. Here we once again see the difference between countries near the end of the distribution curve, which sell not only most of their garments, but most of all products to either the EU or the US—see for instance Albania, Tunisia, Dominican Republic and Haiti. In the middle, in terms of export-destination, more diversified economies are less dependent on the EU and US as trade partners. Notice here in particular Malaysia, Indonesia, China and India.

While the EU is central to efforts to govern garment supply chains, it is for various economies not a central importer, or only one among many important importers. The contrast between an EU-dependent exporter such as Tunisia and a diversified exporter such as Thailand is clear.

In addition, for garment production, producers tend to work for various buyers at once, and it is unlikely that producer X will only supply for one export destination, while producer Y only supplies to another destination. This means that European buyers likely buy from a producer at the same time as various buyers from other countries that may not have legal supply chain requirements for their buying firms.

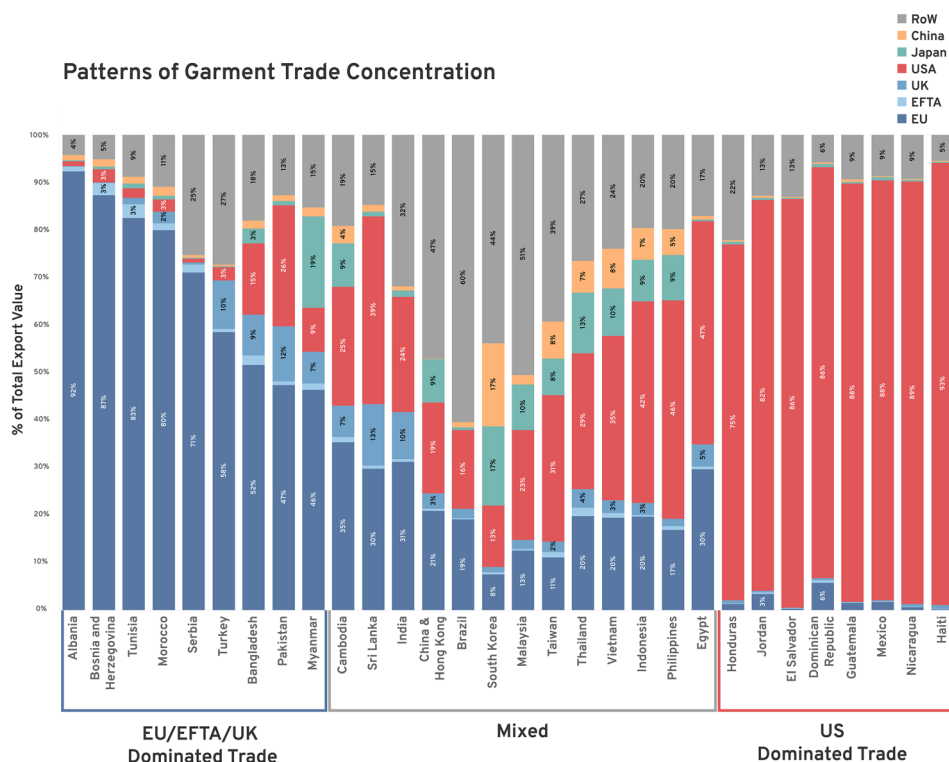


Fig. 1 Patterns of garment trade concentration. Source:^{30,31} based on UN Comtrade 2019 data.



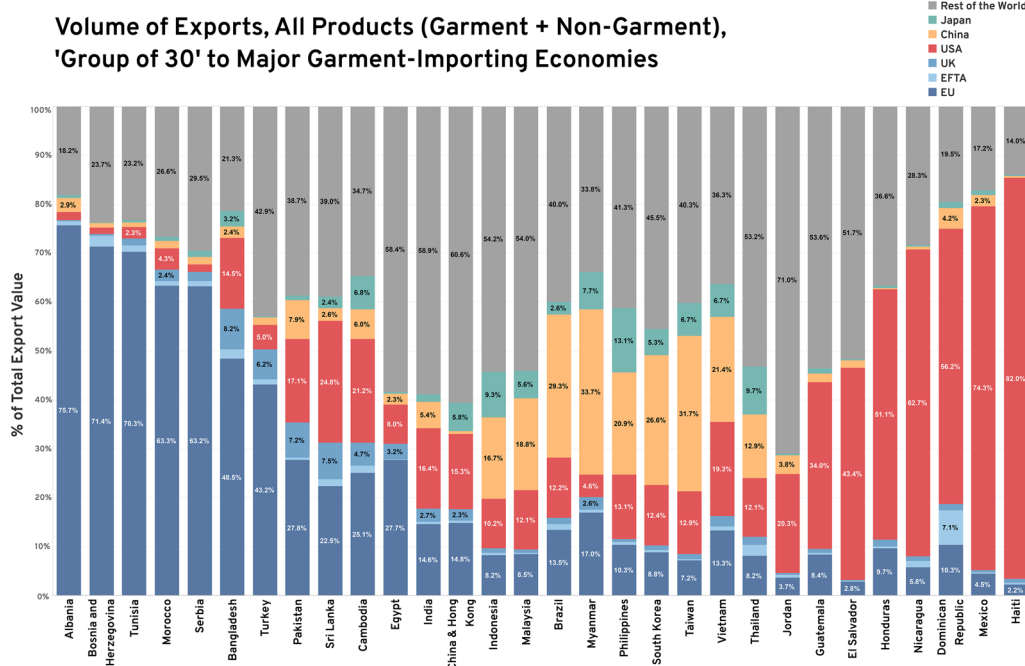


Fig. 2 Volume of exports, all products. Source:^{30,31} based on UN Comtrade 2019 data.

We describe the relationship between these trade patterns and environmental risk by comparing the UN Comtrade data to a recent study measuring climate change risks at garment production sites.³² This study singles out Myanmar, Sri Lanka, Bangladesh, India, Thailand, China and Cambodia as countries where the combination of flooding risk and heat stress might significantly impact economic activity and livelihood, and require significant adaptation policies. The EU is a major buyer of garments in Myanmar and Bangladesh, as Fig. 1 shows, but its share in imports is significantly lower in other mentioned countries with these environmental risks, as is its significance in overall imports (see Fig. 2).

If we perform a similar comparison with regards to human rights risk for the garments industry, based on both legal analysis and rights violations reports, we use the ITUC Global Rights Index (2022). This index ranks 16 from the top 30 garment export countries in the “lowest scoring category” of “no guarantee of rights”. This means that workers have no access to exercising rights and are exposed to autocratic regimes and/or unfair labor practices. These are Cambodia, China, Bangladesh, Egypt, Honduras, Malaysia, Pakistan, Turkey, Philippines, Thailand, Indonesia, India, Haiti, Tunisia, Myanmar, Jordan and Guatemala.

If we compare this to Fig. 3, detailing patterns of garment trade concentration in geographic terms, we note that for 5 high human rights risk countries, the EU imports more than 40% (Tunisia, Turkey, Bangladesh, Myanmar and Pakistan). 11 out of these 16 high risk countries on the index belong to the economies with a mixed garments importer portfolio and less than 40% of trade going into the EU. For 9 out of 16, the EU's stake is at 20% or smaller. For 4 (Guatemala, Jordan, Honduras, Haiti), EU imports less than 5% of garments. In sum, EU's

coverage of garments production for exports varies per country, and is considerable for a few key garment-exporting countries, and limited for many other exporters that are known for significant environmental and human rights risks in garments production. Moreover, in various garment export countries, the EU is likely to have little leverage over and coverage of garments producers at all.

Remember meanwhile that the EU is the largest buying market developing supply chain laws seeking to protect the environment and human rights. The numbers portrayed here in terms of import share and its implications for coverage of and leverage over suppliers, would drop considerably if we were to focus on individual European countries with supply chain legislative ambitions or laws, such as France, The Netherlands, Belgium, Austria or Germany, either individually or as a group—or, indeed if we would focus on non-EU economies with such ambitions or laws, like the UK, Switzerland, Norway, Canada or Australia.

Moreover, for most importing countries, only a portion of sales will be covered by regulations demanding environmental, social and human rights protections, as most laws and legislative proposals require compliance of only the largest firms for their supply chains, rather than the supply chains of all importing firms.⁵

The policy trilemma

The situation in garments trade as described in the previous paragraph, corresponds with what Horner and Nadvi¹⁰ refer to as polycentric trade. Polycentric trade patterns mean that various countries and world regions in the global economy act as sourcing grounds and export destinations. If policy-makers



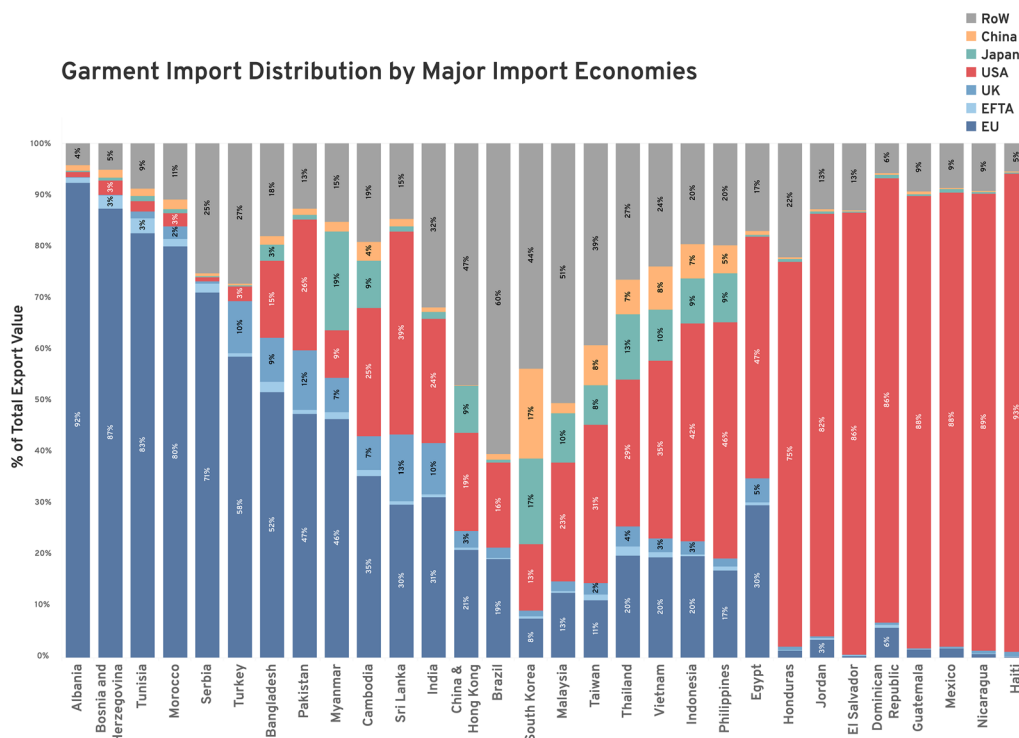


Fig. 3 Garment import distribution by major import economies. Source:^{30,31} based on UN Comtrade 2019 data.

from countries with supply chain governance ambitions are serious about using supply chain governance initiatives as an instrument to advance environmental protection and worker and human rights protections, they should reflect on their options.

We hold that supply chain laws in their current guise have three design features that when taken together, under conditions of such polycentric trade, make it difficult to reconcile with an ambition to systematically advance environmental sustainability and human rights through buying firm's supply chains.

First, all laws and initiatives apply to buying firms from one home market, or to firms active on that market. But the evidence from garment production shows that it may very well be that for some markets covered by such laws, firms on these home markets only import relatively small portions from countries with environmental and human rights risks in or near supply chains.

Second, all legislations and initiatives apply to suppliers all over the world as long as they supply to buying firms covered by such law. This means that supply chain laws also apply to firms that buy from regions or countries where they only buy a little, and therefore, likely have limited leverage over suppliers, production conditions and, hence, environmental and human rights risks.

Third, laws and initiatives assume that, in liberal market terms, buying firms themselves can decide where they will buy from. Most supply chain laws do explicitly describe regions or countries where major supply takes place that are focus of environmental sustainability, human rights or worker rights

improvement activities. This means that under a situation of polycentric trade and a free choice for buying firms, supply chains and the legal efforts focused on improving rights and environmental conditions in these chains, could end up scattered across the world economy.

These three features taken together will leave supply chain laws less effective as an instrument under conditions of polycentric trade, because they encourage a situation of limited economic leverage of buying firms on suppliers in a wide range of regions and countries with environmental and human rights risks.

If policy makers are serious about having supply chain laws work, and therefore want to be realistic about two basic requirements of this instrument, namely that buying firms have actual leverage over their suppliers, and cover a wide range of suppliers, we argue that in a situation of polycentric trade, only two out of these three design features can be combined.

We draw this insight from an analogy with Dani Rodrik's work.¹¹ Rodrik introduced the idea of a policy trilemma in 2000 when debate arose about to what degree advanced economy governments could steer their economy through democratic means in an age of globalized markets for trade, finance and work. The trilemma he designed illustrated that there would be necessary trade-offs for such governments between globalizing markets, maintaining democratic control over governance of markets, and giving nation-states sovereign authority in governing economies. His work inspired academic and policy debate on these kinds of trade-offs for various countries and world regions.³³



Inspired by Rodrik's heuristic, we draw the following triangle, repurposed for supply chain governance instruments, placing one design feature of supply chain governance discussed above in each corner, Fig. 4.

As noted, including all three features in a legislative instrument, in a situation of polycentric trade (*i.e.* legislation that applies to buying firms from one home market and their freely chosen global supply chains) is likely to leave buying firms with legal requirements for their suppliers all over the world, aiming for improvement in environmental sustainability and human rights also in places where their business might be a limited part of trade. However, in line with Rodrik's work, when one of the design feature is dropped, while keeping the other two, it becomes feasible to match expected economic leverage of buying firms with human rights protection ambitions. But, crucially: which two features you take (and which one is dropped) is likely to lead to quite different supply chain governance instruments.

We consider three options below, where each time one corner of the triangle is dropped as a design feature while the other two corners are maintained to inform such an option (see Fig. 5).

Option 1. The requirement that the law covers the single home market is dropped: global scope + free choice of suppliers = "multilateral supply chain regulation"

When the design feature of the focus of a single home market as a determinant of which buying firms should exercise due diligence in their supply chains would be dropped, this would mean that legislators no longer just focus on their own jurisdictions but would go multilateral. They would seek out fellow policy makers from other countries with a significant amount of buying firms in their home markets and either agree to shared legislative activity, or more moderate forms of international coordination and mutual adjustment in designing policy that would allow various countries to align supply chain governance according to a shared understanding of due diligence. This would create a transnational regime that (a) has buying firms still free to choose their suppliers from any place of the world

and (b) boosts the leverage of buying firms considerably across supplying countries and regions. At least for garments, the figures indicate that international coordination should be transatlantic, Eurasian or trans-pacific to be meaningful in terms of boosting economic leverage.

Consider again Fig. 3 above. Imagine that US and EU would join forces on a similar policy for supply chain legislation. For garments, this would mean that most top 30 export countries would have significant coverage and dependence on these two major economies, so as to make it in supply chain terms more likely that the instrument would be effective. For various export countries at least in garments, it is also likely that if Canada, Australia or Japan would collaborate with or emulate the EU's proposal, that significant coverage and leverage would be realizable.

Of course, this approach would come with a significant cost: sharing sovereignty, and going through the time-intensive process of international coordination. Such arrangements would be slow to emerge for sure and success would not be a guarantee. But they would more or less guarantee leverage over a broad amount of suppliers and countries and regions with environmental and human rights risks.

Coordination on a multilateral supply chain governance regime could emerge through various institutions. The G-X groups (G20, in particular) may be a forum for coordination, and so is the Organization for Economic Cooperation and Development. Alternatively, supply chain governance regimes could emerge out of or on top of recently considered, emerging or established transatlantic or transpacific trade deals such as the Canada EU Comprehensive Economic and Trade Agreement, the Transnational Trade and Investment Partnership or the Trans-Pacific Partnership.

Option 2. The global scope of regulating supply chains is dropped: single home market + free choice of suppliers = "unilateral, geographically delimited regulation"

When the design feature of the global applicability of due diligence duties wherever buying firms' suppliers may be, would be

Pick Two, Any Two

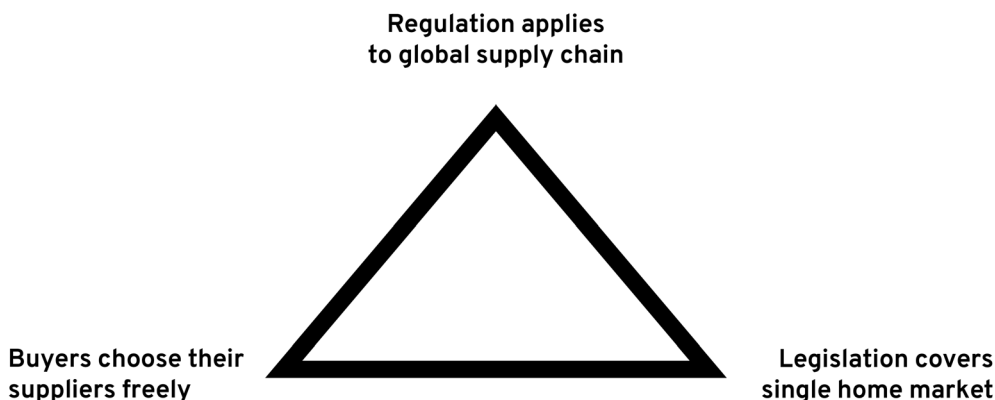


Fig. 4 Pick two, any two.



Design Options for Sustainable Supply Chain Governance

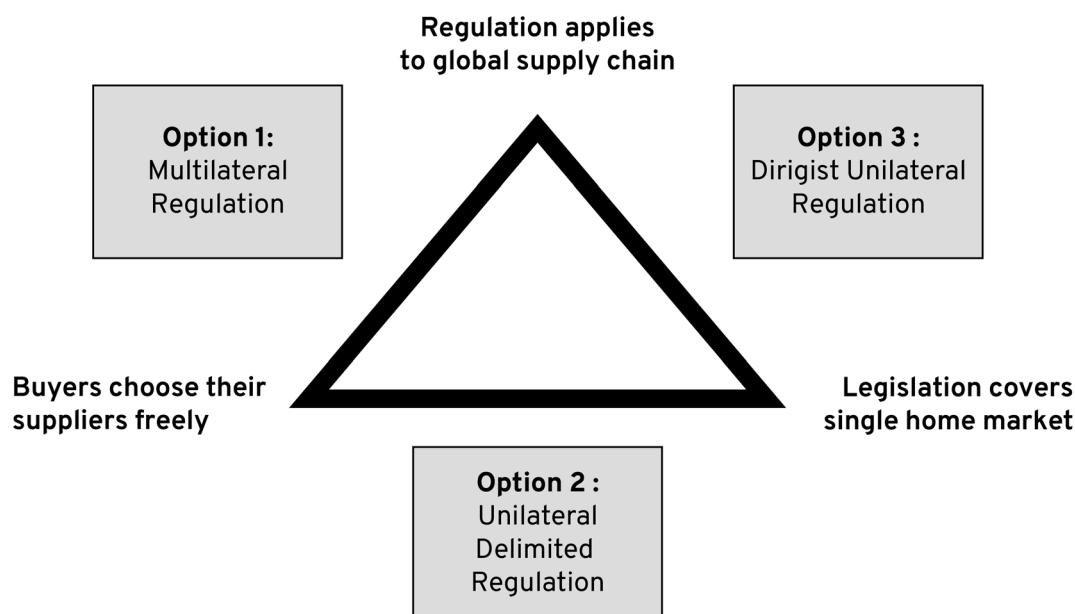


Fig. 5 Design options for sustainable supply chain governance.

dropped, leads to a regime where buying firms are still free to choose their suppliers. Legislation is designed for a single home market, rather than achieved through international coordination, like in option 1. This regime in terms of efforts to address environmental and human rights risks, would then focus on a smaller subset of supplying regions and countries than the overall global supply base of buying firms active on their home market. So if a firm would source from countries A, B, C and D, the regulation would only apply to countries C and D, and firms would be free to source from countries A and B as well. Logically, supply regions and countries chosen for this more restricted regulatory focus would be traditionally important supply bases for buying firms, expected to remain so in the future, so that leverage and positive impact is to be expected. Using our data on garments production as a reference, this would for the EU for instance mean that suppliers from Tunisia, Turkey, Myanmar, Pakistan and Bangladesh would be candidates to become subject to this regulatory model, given the EU's importance as an importer.

In addition, regulation may focus on the state of environmental or human rights risk in these countries. One option is to go for countries and regions with significant risks, so that regulatory attention could go where it is most needed. In the context of garment trade, these could be any of the countries scoring lowest on the ITUC's rights index, regions where water pollution, or soil degradation as a result of agriculture, is particularly impactful, and/or places where heat and flooding endanger garment production. Alternatively, legislators could choose countries with a stronger political-institutional profile, so that legislation's positive impact could be more likely. This builds on the insight that irresponsible corporate conduct in

the environmental, worker rights or human rights realm is more likely in situations with less strong domestic institutional environments.³⁴ For garment exports to the EU this could for instance be Albania. What could count politically here too, would be Albania's candidacy for EU membership, possibly advancing effective implementation. If the US were to design such law, this could be the Dominican Republic.

Proponents of this option would likely sell it as creating an instrument that matches ambition with feasibility, while maintaining the relative speed of unilateral action.

The downsides are also clear: less global focus, and an uneven playing field in the world economy between on the one hand, regions under environmental and human rights risk scrutiny through such an instrument and on the other, regions where such scrutiny is absent. With this comes also the possibility of regions without such scrutiny having a strategic advantage over regions with such regulatory focus, so that opportunistic buying firms would be able to move orders from countries subject to regulations to countries without such regulatory focus. Compared to an option where regulation applies to suppliers everywhere in the world, the model is also less adaptive to external shocks leading to changes in supply chains, such as geopolitical strife leading to war or protectionist measures, economic crises and monetary shocks.

Notice however that this model approximates previous and current policy experiments for national projects for improving human rights in particular countries, backed up by important trading partners and their lead firms. Most notable examples are the Bangladesh Accord and the International Labor Organization/International Finance Corporation Better Work programs. These programs have a more soft-law status than the



supply chain laws and legislative initiatives discussed here, but share the ambition to have meaningful impact through supply chain leverage in a geographically and jurisdictionally restricted area of the world. The Accord in particular in terms of buying firm involvement has also had a distinct European flavor,³⁵ which invites comparisons with a regulatory design where EU supply chain regulation would focus on a limited amount of supplier countries.

The current version of regulation of conflict mineral trade through the US Dodd-Frank Act can be viewed as a hard-law analogue to this approach, because of its description of a particular geographic focus of attention (the DRC and its neighborhood) for particular due diligence requirements for buying firms.

Notably, this option may also speak to a politically salient concern about supply chain governance in general: that it would have inequitable geopolitical tendencies and impose rules from the North on to Southern economies.³⁶ A type of legislation focused on a limited number of countries, more easily facilitates a scheme where rules can be designed and governed more equitably on a North–South scale, and be co-shaped by the respective export countries.

Option 3. The free choice of suppliers is dropped: single home market + global scope = “unilateral dirigist regulation”

The final option would be that laws focus on single home markets and with a global scope for the supply chain, but to let go of buying firm's ability to freely choose suppliers from every region or country in the world. In this option, legislation would cover complete supply chains, but governments would determine what supply areas buying firms could choose their suppliers from. Governments could then force firms to source from countries with lower environmental and human rights risk profiles.

Without a doubt, this option is the most radical of the three options described here, given how it departs from liberal trade assumptions that inform World Trade Organization agreements and other trade arrangements.

But still, the logic itself is not pie in the sky. Its historical equivalent is a situation of protectionist trade policies, restricting firm's ability to offshore production, an option that some pundits consider a likely scenario for the near future.³⁷ A contemporary version of this option is to ban imports from a limited set of countries and regions altogether because of risks there, for instance as the US announced for cotton and tomatoes from the Chinese Xinjiang region under the Trump administration in 2021. This leaves a smaller world sourcing region to buy from. (Note how the Biden Administration later on promoted due diligence requirements for firms importing from Xinjiang rather than a simple ban).

Proponents of such an approach would point out that directing supply chains is the most effective manner of matching leverage with the policy goal of protecting the environment and human rights. They could also argue that countries seeking to belong to the supply base of buying firms

subject to this regulation, could be motivated to improve their conditions.

Opponents of this option will point out the economically and societally detrimental effect of reducing cross-border trade in this manner, and how environmental and human rights requirements might function as excuses for re-shoring production to advanced economies to save or create jobs there.

Discussion and conclusion

This paper started off with the observation that extant research currently underemphasizes the structures of trade and supply chains in assessing the potential of supply chain laws to protect human rights, worker rights and the environment. This led us to question whether policymaker assumptions about the state of supply chains were accurate when they designed supply chain legislations that would lead to buying firm responsibility for environmental sustainability, human rights and worker rights protections in their supply chains. Examining the case of the garment industry, our empirical results show highly varying leverage of countries with supply chain legislative ambitions on their trade partner countries, including those with high risk profiles in terms of environmental sustainability, human rights and worker rights protection. This is because in some countries laws will cover only few production zones, or because firms having to comply with laws will only have limited buying power in these production zones. This indicates the limited impact supply chain legislation is likely to have on these issues in these countries.

Our case study leads us to propose the policy trilemma framework, suggesting a way forward in discussing trade-offs in the design and implementation of supply chain governance that emerge as a result of polycentric trade patterns in the global economy. We hope the framework can be used as a heuristic in current policy debates about making supply chains sustainable and fair, through both implementation of existing law, and future development of law. Three ideal-typical options arise as a result of our policy trilemma framework, each time informed by a combination of commitment to a global regulatory scope in terms of suppliers, a domestic market scope in terms of compliance, or the liberty of buying firms to select their suppliers.

Theoretical implications

Our focus on supply chains and trade relations as an enabling or constraining factor in supply chain law effectiveness is an advance on extant studies examining the potential of laws in terms of their institutional design^{2,5} or on the basis of observable change in corporate policies at multinational firm level.⁷ It also enriches the study of sustainability governance and global value chains, which, as noted, has hinted at the relevance of changing trade structures for governing supply chains for sustainability and human rights goals, but has as of yet, not systematically investigated trade structures and their relationship to supply chain governance effectiveness.



By systematically adding the trade relations aspect to the discussion of supply chain governance's potential, we enrich the academic debate on how supply chain governance should be shaped into the future. This discussion has so far focused on other pertinent issues such as the level of stringency of prescriptions for companies in laws,⁷ the role of courts and legal liability,⁸ and the proper mix of hard law and soft law policy instruments in implementing the law.² Our results and developed framework instead emphasize the importance of the scale of legislation, the geographic scope of supply chains covered by legislation, and what freedom buyers would have to choose suppliers.

Limitations and future research

Our study is limited in terms of chosen supply chain policy focus (supply chain laws), industry focus (garments) and empirics used to investigate supply chains (based on country trade data).

In terms of further study building on our ideas, we therefore first observe that while having used extant supply chain laws and legislative initiatives as our focus, the implications of a Rodrik-type of policy trilemma, and the options that flow from it, can also be used to examine other kinds of supply chain governance arrangements presupposing economic leverage of buying firms over supplying firms. This could include environmental and human rights criteria built into trade agreements,³⁸ developmental partnership programs and various voluntary industry partnerships. There too, policy designers need to think carefully about how environmental and human rights policies are related to the structure of supply chains and what kind of design may be beneficial in that light.

In terms of industry focus, second, further study could go into other relevant sectors with environmental sustainability, human rights and worker rights risks, for instance contrasting manufacturing with agriculture or raw material sectors. We have used garments as an illustrative case because of its high risk status to make our point about the relevance of polycentric trade structures underlying supply chain governance initiatives. If we review contemporary trade patterns, we for now consider it likely that similar conclusions could be drawn about commodities like sugar, soy, tea and palm oil as well as various manufactured IT electronics products, which all have significant environmental and human rights risks in production.

A final limitation is that trade relations do not allow us to unpack buying firm-supplying firm relations in terms of leverage of the one over the other. Future work may investigate in greater depth what such relations look like and what the implications of this are for supply chain governance.

Policy implications

Our presented framework bears significant implications for policymakers as it indicates that the effectiveness of supply chain legislation is dependent on the chosen scale of policy-making, the freedom given to buying firms to shape their supply chain and the geographic scope of production to be covered by law. The framework therefore sheds lights on factors

arguably hitherto receiving less attention in supply chain legislative processes,² which will demand more attention if supply chain governance is to be an instrument for advancing environmental sustainability, worker and human rights goals.

The trade relations perspective matters also in relation to ongoing discussions about which class of buying firms should comply with supply chain laws. As noted, most laws require compliance from a smaller subset of markets, defined by firm size. In the EU policy process for CSDDD, this scope has been limited at the last hour to only cover the largest class of companies.³⁹ This means that the directive now covers a much smaller subset of flows captured by trade data than in the original proposal, further begging the question of what scope and leverage such firms would effectively have over exporters. All the more reason to consider polycentric trade as a challenge to designing effective sustainability instruments, and address the policy trilemma that arises because of it.

Data availability

All data used for this study are available from The Growth Lab at Harvard University. The Atlas of Economic Complexity, <http://www.atlas.cid.harvard.edu>.

Author contributions

Luc Fransen contributed to conceptualization, data analysis and writing of the original draft, review and editing. Martin Curley contributed to conceptualization, data curation and data analysis, and review and editing. Anne Lally contributed to conceptualization, review and editing.

Conflicts of interest

There are no conflicts to declare.

Acknowledgements

We thank Jacopo Caja for research assistance with UN Comtrade data and Lukas Linsi for helpful feedback on trade data use and conceptualization. Martin Curley's work was supported by ASN Bank. Luc Fransen was supported through a Dutch Science Association NWO Open Competitie M Grant.

Notes and references

- 1 European Commission, *Corporate Sustainability Due Diligence*, https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en.
- 2 M. T. Gustafsson, A. Schilling-Vacaflor and A. Lenschow, Foreign corporate accountability: the contested institutionalization of mandatory due diligence in France and Germany, *Regul. Gov.*, 2022, 17(4), 891–908.
- 3 Dutch Ministry of Foreign Affairs Expert Meeting, *A new era for doing business: an exchange on mandatory due diligence*, The Hague, January 23, 2023.



- 4 A. Schilling-Vacaflor and M. T. Gustafsson, Integrating human rights in the sustainability governance of global supply chains: exploring the deforestation-land tenure nexus, *Environ. Sci. Policy*, 2024, **154**, 103690.
- 5 A. Rühmkorf, From Transparency to Due Diligence Laws? Variations in Stringency of CSR Regulation in Global Supply Chains in the 'Home State' of Multinational Enterprises, in *Globalisation of Corporate Social Responsibility and Its Impact on Corporate Governance*, ed. J. Du Plessis, *et al.*, Springer, 2018, pp. 177–201.
- 6 D. Weihrauch, S. Carodenuto and S. Leipold, From Voluntary to Mandatory Corporate Accountability: The Politics of the German Supply Chain Due Diligence Act, *Regul. Gov.*, 2022, **17**(4), 909–926.
- 7 G. LeBaron and A. Rühmkorf, Steering CSR through Home State Regulation: A Comparison of the Impact of the UK Bribery Act and Modern Slavery Act on Global Supply Chain Governance, *Global Policy*, 2017, **8**(S3), 15–28, DOI: [10.1111/1758-5899.12398](https://doi.org/10.1111/1758-5899.12398).
- 8 C. Bright, A. Marx, N. Pineau and J. Wouters, Toward a corporate duty for lead companies to respect human rights in their global value chains?, *Business and Politics*, 2020, **22**(4), 667–697.
- 9 M. Serdijn, A. Kolk and L. Fransen, Uncovering missing links in global value chain research—and implications for corporate social responsibility and international business, *Critical Perspectives on International Business*, 2021, **17**(4), 619–636.
- 10 R. Horner and K. Nadvi, Global value chains and the rise of the Global South: unpacking twenty-first century polycentric trade, *Global Networks*, 2018, **18**(2), 207–237.
- 11 D. Rodrik, How far will international economic integration go?, *Journal of Economic Perspectives*, 2000, **14**(1), 177–186.
- 12 J. Ruggie, Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and other Business Enterprises: Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework, *Netherlands Quarterly of Human Rights*, 2011, **29**(2), 224–253, DOI: [10.1177/016934411102900206](https://doi.org/10.1177/016934411102900206).
- 13 T. Bartley, *Rules without Rights: Land, Labor, and Private Authority in the Global Economy*, Oxford University Press, Oxford, 2018.
- 14 C. L. Lau, C. D. Fisher, J. F. Hulpke, W. A. Kelly and S. Taylor, United Nations Global Compact: The Unmet Promise of the UNGC, *Social Responsibility Journal*, 2017, **13**(1), 48–61.
- 15 E. Boonaert and M. Maertens, Voluntary sustainability standards and farmer welfare: the pathways to success?, *Food Policy*, 2023, **121**, 102543.
- 16 L. Fransen, Global companies and the private regulation of global labor standards, in *The handbook of global companies*, ed. J. Mikler, Wiley, 2013, pp. 437–455.
- 17 G. LeBaron and J. Lister, Benchmarking global supply chains: the power of the 'ethical audit' regime, *Review of International Studies*, 2015, **41**(5), 905–924.
- 18 R. M. Locke, *The promise and limits of private power: promoting labor standards in a global economy*, Cambridge University Press, 2013.
- 19 P. Schleifer and Y. Sun, Emerging markets and private governance: the political economy of sustainable palm oil in China and India, *Review of International Political Economy*, 2018, **25**(2), 190–214.
- 20 N. J. Langford, From global to local tea markets: the changing political economy of tea production within India's domestic value chain, *Development and Change*, 2021, **52**(6), 1445–1472.
- 21 S. Kuruvilla, *Private regulation of labor standards in global supply chains: problems, progress, and prospects*, Cornell University Press, 2021.
- 22 L. Linsi and D. K. Mügge, Globalization and the growing defects of international economic statistics, *Review of International Political Economy*, 2019, **26**(3), 361–383.
- 23 P. Schleifer, *Global Shifts: Business, Politics, and Deforestation in a Changing World Economy*, MIT Press, 2023.
- 24 Quantis, *Measuring Fashion: Environmental Impact of the Global Apparel and Footwear Industries Study*, Lausanne, 2018.
- 25 J. Boucher and D. Friot, *Primary microplastics in the oceans: a global evaluation of sources*, IUCN International Union for Conservation of Nature, 2017, DOI: [10.2305/IUCN.CH.2017.01.en](https://doi.org/10.2305/IUCN.CH.2017.01.en).
- 26 S. Sharpe, E. Dominish and C. Martinez-Fernandez, *Taking climate action: measuring carbon emissions in the garment sector in Asia*, ILO, Bangkok, 2022, DOI: [10.54394/WAWN5871](https://doi.org/10.54394/WAWN5871).
- 27 R. Jackson, *Mapping Child Labour Risks in Global Supply Chains: An Analysis of the Apparel, Electronics and Agricultural Sectors*, UNICEF, 2019, <https://www.unicef.nl/files/ChildLabourinGlobalSupplyChains.pdf>.
- 28 M. Anner, Two logics of labor organizing in the global apparel industry, *International Studies Quarterly*, 2009, **53**(3), 545–570.
- 29 G. LeBaron, R. Edwards, T. Hunt, C. Sempéré and P. Kyritsis, The ineffectiveness of CSR: understanding garment company commitments to living wages in global supply chains, *New Political Economy*, 2022, **27**(1), 99–115.
- 30 The Growth Lab at Harvard University, The Atlas of Economic Complexity, <https://atlas.cid.harvard.edu/>, accessed January 5, 2023.
- 31 M. Curley, A. Lally, L. Fransen, J. Caja and L. Linsi, Trade Realities: Using Trade Data to Strengthen the Design of Supply Chain Governance, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4399384.
- 32 J. Judd, A. Bauer, S. Kuruvilla and W. Stephanie, *Higher Ground? Report 1: Fashion's Climate Breakdown and Its Effect for Workers*, 2023, <https://ecommons.cornell.edu/items/6f1e503a-2f9b-4f71-96b2-580c9ed6c1d0>.
- 33 M. Funke and D. Zhong, The political globalization trilemma revisited: an empirical assessment across countries and over time, *Economics & Politics*, 2024, **36**(1), 177–201.



- 34 M. Iborra and M. Riera, Corporate social irresponsibility: what we know and what we need to know, *Corp. Soc. Responsib. Environ. Manag.*, 2023, **30**(3), 1421–1439.
- 35 C. Oka, N. Egels-Zandén and R. Alexander, Buyer engagement and labour conditions in global supply chains: the Bangladesh accord and beyond, *Development and Change*, 2020, **51**(5), 1306–1330.
- 36 G. Schouten and V. Bitzer, The Emergence of Southern Standards in Agricultural Value Chains: A New Trend in Sustainability Governance?, *Ecological Economics*, 2015, **120**, 175–184.
- 37 D. B. Fuller, *Weaponizing interdependence & global value chains: US export controls on Huawei*, American Political Science Association Pre-prints, 2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4221915.
- 38 A. Marx and N. Brando, The protection of labour rights in trade agreements: the case of the EU-Colombia agreement, *Journal of World Trade*, 2016, **50**(4), 587–610.
- 39 CIDSE, *EU member states finally agree on CSDDD*, March 18, 2024, <https://www.cidse.org/2024/03/18/eu-member-states-finally-agree-on-csddd/>.

