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Undiversity, inequity, and exclusion in supply chains: The unintended fallout of economic sanctions and consumer boycotts

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Abstract
Economic sanctions and consumer boycotts are common tools to punish organizations for undesirable behavior and attempt to coerce them to change their actions. However, these tools occasionally spill over beyond the intended recipients and affect guiltless supply chain members, jeopardizing the principles of diversity, equity, and inclusion in supply chains. This study identifies four channels through which sanctions and boycotts propagate through supply chains. In particular, supply chain members can be affected by direct relationships with targeted organizations, disruptions in accessing foreign markets, inability to access technology, and logistics failures. Potential solutions include mapping supply chains, proactive cooperation, network analysis, and shortening supply chains. While the work provides a general framework for research and practitioners, it also identifies areas for further studies, such as the role of new technologies and the effect of sanctions and boycotts on supply chain sustainability.

KEYWORDS
consumer boycotts, DEI, economic sanctions, supply chain management

1 | WHAT ARE SANCTIONS AND BOYCOTTS?

The principles of diversity, equity, and inclusion (DEI) in supply chain management imply that any business should have equal rights and inclusion in supply chains regardless of its size, country of origin, ownership, and other characteristics (Sordi et al., 2022). While supply chains generally move towards embracing DEI principles, we can see numerous instances of their deliberate violations, often supported by the public and authorities (Hufbauer & Jung, 2021). These violations can take multiple forms, with some of the most extreme being sanctions (if mandated by authorities) and consumer boycotts (if implemented voluntarily). Both sanctions and boycotts may result in the exclusion of certain businesses from supply chains, which directly contradicts the principles of equity and inclusion and reduces diversity in supply chains.

We do not discuss the legality or ethics of sanctions and boycotts in this essay, and we do not emphasize the *direct* effects of sanctions and boycotts on the intended recipients as necessarily damaging supply chain DEI. We assume that the intended recipients of boycotts and sanctions are subject to a fair punishment for their undesirable actions or inactions (which, interestingly, might include violations of DEI principles). However, the secondary effects of sanctions and boycotts on guiltless members of international supply chains do threaten DEI.

For example, in September 2020, the United States imposed sanctions against a number of Chinese manufacturers of semiconductor chips, banning businesses from freely exporting technology and equipment to the sanctioned firms. Almost 2 years later, in the summer of 2022, some tourists had to cancel their trips to Ireland. While these two events may seem independent, a complex chain of events connects them. The U.S. sanctions forced at least one major North American car manufacturer to switch suppliers, from China's Semiconductor Manufacturing International Co., or SMIC, to Taiwan Semiconductor Manufacturing Co. (TSMC). Struggling from the effects of drought and facing a COVID-19-induced demand surge, TSMC was severely

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overbooked and could not supply chips in sufficient quantities, further exacerbating the emerging worldwide chip crisis. As a result, auto manufacturers had to curtail production due to supply disruption (Klayman & Nellis, 2021). The unavailability of cars, in turn, substantially impacted the rental car industry. Having downsized during the pandemic, rental car companies could not purchase new cars to scale up their fleets. Hence, rental car prices skyrocketed, even prompting a U.S. congressional inquiry into "possible predatory business practices" (Sampson, 2022). The problem spilled over the U.S. border and hit many countries around the world, with Ireland being most severely affected as an island nation without substantial local car manufacturing capacity. Their rental car prices reached tens of thousands of euros per week, prompting tourists to reconsider their decision to spend a holiday in the country (O'Driscoll, 2022).

The first recorded mention of economic sanctions goes back to Ancient Greece, when the Athenian Empire banned the citizens of Megara from accessing most Greek harbors, seeking to coerce Megara to change its policies regarding the cultivation of sacred lands and sheltering fugitive slaves from Athens. In that case, the sanctions did not achieve their goals and may have contributed to the beginning of the Peloponnesian War (Brunt, 1951). While the exact goals of economic sanctions have changed over the millennia, the fundamental principle has stayed the same—one entity (usually more developed economically) sets economic restrictions on another (typically less developed economically) in an attempt to force the latter to adjust their policies. Penalties for sanction evasion have usually been strict throughout history. For example, the code of Justinian, dating back to the sixth century CE, threatens property confiscation and capital punishment to anyone paying "barbarians" with gold, supplying them with weapons or raw materials for their manufacture, or teaching them shipbuilding (Stantchev, 2012). In the modern-day United States, a breach of sanctions may lead to up to 20 years of imprisonment alongside hefty financial penalties. Moreover, non-U.S. entities can also be charged for violating U.S.-imposed sanctions if they have a sufficient nexus to the U.S. jurisdiction, which could be, for example, denominating transactions in U.S. dollars (Walker Morris, 2021).

Sanctions and boycotts can also affect the employees of targeted firms, often in unintended ways. For example, in the context of child labor, when violations are discovered at a supplier facility or in a region and boycotts are imposed, children working for that supplier or in that region are more likely to be laid off and pushed into worse working conditions. One such example involves the Bangladeshi garment industry's reaction to a proposed Child Labor Deterrence Act in the United States in the 1990s (Nielsen, 2005). Furthermore, after the Rana Plaza disaster, when the Walt Disney Company decided to suspend supplies from Bangladeshi factories, it was heavily criticized because of a similar expected effect on employees. Some economists believe that such policies are deemed to deteriorate employees' conditions in the short term but lead to fundamental positive shifts over the long run. In 2021, Disney reinstated supplies from Bangladeshi factories conditional on their partnership with the Better Work program by the International Labour Organization (Disney, 2021). Meanwhile, others argue that sanctions do not reduce child labor (Jafarey & Lahiri, 2002) and may have a negative effect on communities. For example, Parker et al. (2016) showed that the U.S. sanctions against the companies involved in the extraction of conflict minerals in the Democratic Republic of Congo preceded increased infant mortality in the region. However, there is no general consensus on the matter, and a summary of the state of research (Grossmann & Michaelis, 2007) concluded that "analysis does not suggest that trade sanctions aimed at combating child labor must always be a failure."

2 | HOW HAVE SANCTIONS AND BOYCOTTS EVOLVED?

Investigating the ethics of economic sanctions, McGee (2003) concluded that "economic sanctions are very difficult to justify on any grounds," and they "should not be used as a tool of international relations." Furthermore, the effectiveness of economic sanctions in achieving their objectives is highly debatable (Demena et al., 2021; Pape, 1997). Yet, sanctions remain a popular instrument of economic pressure among national governments and international organizations. The total number of active cases of international sanctions has increased from less than 50 in the 1960s to more than 200 in the 2010s. As of 2019, about two-thirds of all sanctions are imposed by three major players—the United States (∼40%), the European Union (EU; ∼15%), and the United Nations (∼10%) (Felbermayr et al., 2021).

Partly as a response to the criticisms, economic sanctions have evolved significantly over the last several decades. In lieu of nationwide sanctions hurting populations at large, governments and international organizations have increasingly turned to design targeted (or "smart") sanctions (Drezner, 2011) that target particular individuals, companies, or industries. The idea is that smart sanctions can still achieve the desired change in the recipient's behavior while minimizing the collateral damage to third parties. While the adverse effect of such sanctions on DEI in supply chains should be limited, Sun et al. (2022) reported that the effects of sanctions continue to propagate along the conduits of existing supply chains, eventually damaging nontargeted firms.

The shift from comprehensive to targeted sanctions requires a change in the research paradigm, from economics-led research on the broad effectiveness and ethics of sanctions to operations management-led research on the effect of sanctions on organizations and supply chains. Supply chains appear to be the critical link through which the effects of targeted sanctions propagate to untargeted businesses and individuals. While there exists a vast literature on the general effectiveness of sanctions, research on their operational and supply chain impacts remains remarkably scarce and

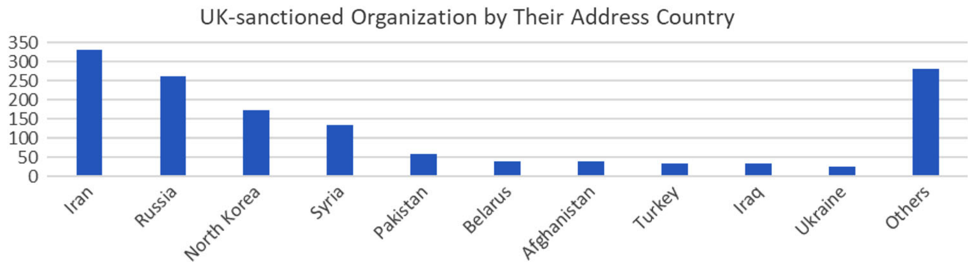

FIGURE 1 Address countries of U.K.-sanctioned organizations. [Color figure can be viewed at wileyonlinelibrary.com]

fragmented. Our current understanding of how the effects of sanctions spread through supply chains is insufficient to predict their overall impact and consequences.

The same limitations apply to consumer boycotts. Although boycotts often originate as grassroots movements and may have ambiguous leadership or ill-defined objectives, they can still inflict substantial damage on entire supply chains. Similar to smart sanctions, boycotts intend to affect only a targeted entity. Boycotts can be viewed as discriminatory practices arising due to economic nationalism (Charpin, 2022) or following a corporate social irresponsibility incident (Scheidler & Edinger-Schons, 2020), with the potential to endanger international supply chains. For example, after calls to boycott clothing companies supplying cotton from the Uyghur region of China due to the alleged use of forced labor, in 2020 a number of companies severed ties with their suppliers in the region. Somewhat ironically, this did not save them completely, as instead, they faced a boycott from Chinese consumers for not supplying from local businesses (Olcott & Storbeck, 2022).

3 | WHAT ARE THE TARGETS?

At the organizational and supply chain levels, good data are currently hard to come by. To explore the effect of sanctions on DEI in global supply chains, we examined the complete dataset of organizations sanctioned by the United Kingdom as of August 2022 (Cabinet Office, 2022). After removing duplicate entries and branches of the same organizations, we identified 1415 sanctioned organizations with verified registration addresses. Figure 1 shows the top 10 address countries of sanctioned organizations.

Out of 1415 sanctioned organizations, only 28 are registered in developed countries; 98% are from developing countries, including 9% from the least-developed countries. Such a disproportional exclusion of organizations from developing nations may indicate the direct damaging effect of sanctions on supply chain DEI.

This essay explores how the effects of economic sanctions and consumer boycotts propagate through supply chains and develops a risk-mitigation framework for supply chain practitioners, with the objective of minimizing the collateral impacts on DEI in supply chains. This framework will help supply chain managers identify critical risks early and adapt their practices to mitigate risks related to sanctions and boycotts.

Although existing research specifically related to the impact of sanctions and boycotts on organizations and supply chains is scarce, we leverage the body of knowledge in the domains of economics and international relations, where sanctions have been researched for many decades, with a resurgence in the past few years. Many of those papers may contain invaluable insights into supply chains, but the findings remain fragmented. The existing attempts to bring the topics of sanctions and boycotts to the supply chain management domain have been limited to studies on particular industries or merely recognizing sanctions as a supply chain risk, lacking an overarching framework.

4 | HOW DO SANCTIONS AND BOYCOTTS SPREAD THROUGH SUPPLY CHAINS?

Sanctions and boycotts spill over and extend beyond the targeted recipient via several avenues. We discuss each separately and highlight potential hedging strategies.

4.1 | Direct relationships

Having a sanctioned entity or individual in a supply chain as a customer or supplier bears a huge risk of sanction extension to the focal firm. In many instances, the firm may be unaware of dealing with sanctioned entities. For example, currently, bankrupt Hin Leong Trading, one of the largest Singaporean oil traders, came under fire in 2019 for selling petroleum to North Korea in breach of international sanctions. While Hin Leong Trading insisted on not knowing the identity of the buyer, and the investigation could not prove otherwise, the company suffered substantial reputational damage (Whalen, 2019). In another case, the fintech company TransferGo was fined by the U.K. authorities for issuing instructions to make payments to accounts at sanctioned banks (Walker Morris, 2021). Interestingly, the recipients were not sanctioned and may well have been unaware that their banks were under U.K. sanctions. TransferGo's attempts to appeal this decision were unsuccessful as the court concluded that funds held in a bank account ultimately belong to that bank rather than account holders. In this example, neither contracting party was under sanctions, but the direct relationship with sanctioned financial intermediaries was sufficient to trigger a sanctions breach event.

4.2 | Access to foreign markets

Sanctions and boycotts tend to target large organizations having a substantial impact on entire ecosystems. If such an organization gets restricted from international trade, it might affect numerous smaller players that depend on the infrastructure of the targeted firm. For example, the cotton farmers in the Uyghur region not using forced labor have had their ability to export their products impaired after the general boycott by the international apparel brands. Several factors come into play concurrently. First, many of the farmers are small- and medium-sized enterprises (SMEs). Hence, in the absence of scale, transportation, and storage become much more expensive for the remaining suppliers. Second, it is often difficult for buyers to distinguish between complying and noncomplying suppliers. To be on the safe side, many simply stop dealing with all suppliers in a high-risk area.

Sanctions and boycotts can also impact the value of a country's currency, affecting all parties using it. The net effect on the currency exchange rate depends on the composition of import and export restrictions. Import restrictions decrease the demand for foreign currencies and generally lead to the appreciation of the local currency, while export restrictions generally have the opposite effect. Exchange rate fluctuations mean that either importers or exporters, although untargeted directly, will bear the additional cost of accessing foreign markets. Schott et al. (2008) analyzed the impact of 28 U.S.-inspired economic sanctions and found that they significantly reduced bilateral trade and moderately reduced the target's trade with other countries, with the foreign exchange rate being one of the driving factors.

4.3 | Access to technology

As sanctions are usually imposed on economically inferior entities, targeted organizations often rely heavily on the sanctioner's technology. Without access to the latest equipment or software, the efficiency of the targeted organizations inevitably falls. However, as Sun et al. (2022) confirmed in the case of recent EU and U.S. sanctions on Zimbabwean firms, this loss of efficiency in targeted firms is contagious for other supply chain members. Consider the example of U.S. and EU sanctions on exports of equipment and technology for the oil, gas, and petrochemical industries in Iran. While the intent was to limit Iran's ability to pursue its nuclear program by reducing its revenue from exporting petroleum products, they hit the Iranian automotive and transportation sectors: Major car manufacturers had to postpone the adoption of the Euro 5 emission standards, and the Tehran City Council could not proceed with the installation of diesel particulate filters on its bus fleet (Madani, 2021). In this example, automotive manufacturers or city councils were not sanctioned, but the inability to access technology to manufacture exhaust filters and related components caused nontargeted organizations to suffer alongside the targeted ones (and even worked against international sustainability goals).

4.4 | Logistics failure

Imposing sanctions or announcing a boycott affects how goods and services are delivered, but the problem magnifies if shipping or cargo handlers are directly targeted by sanctions or boycotts. This often leads to logistics bottlenecks and reduced capacity, which may spread across supply chains and affect a wide range of nontargeted entities, including the sanctioners themselves. A recent example is the decision of some port workers not to handle Russian cargo amid the Russo-Ukrainian conflict. While the purpose of this boycott was to limit Russian trade, it led to the accumulation of stationary Russian cargo in participating ports, which blocked the flow of other goods and essentially reduced the ports' capacities (Baker, 2022).

The effect of sanctions on logistics is not necessarily immediate. For example, in 2017 Saudi Arabia, Bahrain, Egypt, and the United Arab Emirates imposed sanctions on Qatar for the alleged support of terrorist organizations. The sanctions mainly restricted trade between the sanctioning states and Qatar, essentially imposing a land blockade of Qatar and a severe restriction on available sea trade options. As other nations did not join the sanctions at that point, most Qatari companies were able to find alternative suppliers from other countries and navigate through the crisis reasonably well. The sanctions were lifted in 2021, partly due to their inability to lead to any meaningful change in Qatar's policies (Ramani, 2021). However, higher supply chain costs during the period under sanctions affected the country's capital expenditure (CNBC, 2017) in preparation for the 2022 Football World Cup, culminating in a major logistical challenge because of insufficient accommodation available for the event. Many spectators had no choice but to stay in neighboring countries and commute by plane to attend the games (Walsh, 2022).

5 | HOW CAN SUPPLY CHAINS PREPARE?

The previous section presented four channels through which sanctions and boycotts may undermine DEI in supply chains by spreading their effects beyond the intended recipients. Conducting more research on the issue and disseminating its results to increase the awareness of policymakers and NGOs about the potential fallout of their actions could be part of a longer-term solution. Meanwhile, supply chains can take specific actions to prepare for potential adverse consequences. In this section, we explore how operations and

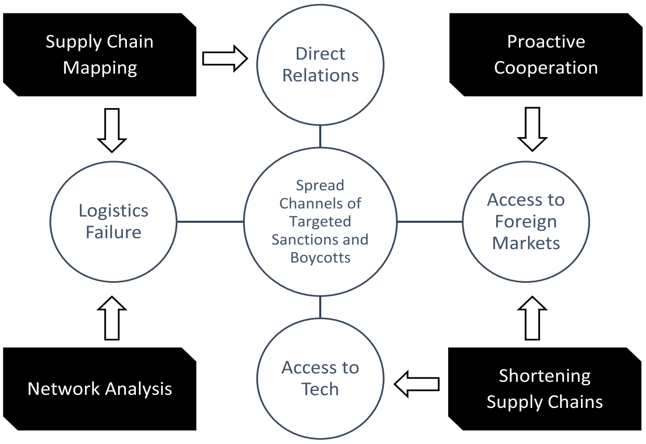

FIGURE 2 Four supply chain responses to mitigate contagion risks from sanctions and boycotts. [Color figure can be viewed at wileyonlinelibrary.com]

supply chain managers can mitigate the resulting risks of the contagion effects of sanctions and boycotts. Figure 2 provides an overview of the four risk channels along with four potential responses to address them.

As illustrated by Figure 2, the propagation of sanctions and boycotts takes a more complex form than other supply chain risks. Traditional risk-mitigation strategies consider risk propagation as a cascading event. Classical risk-mitigation solutions such as segmenting or regionalizing supply chains (Chopra & Sodhi, 2014) primarily focus on stopping risk propagation from one supply chain member to another. This view corresponds to the direct relations channel outlined in this essay while not incorporating the others. At the same time, each propagation channel of sanctions and boycotts requires a tailored response to improve supply chains' preparedness. We discuss each of these four responses in detail.

5.1 | Supply chain mapping

Proactively, it is essential to verify the identity of immediate buyers and suppliers and map the supply chain beyond tier-one relationships to identify potential threats. Many organizations have already taken steps to learn more about their deeper-tier suppliers. Meanwhile, it is often harder to track customers' identities. The problem of reliably identifying customers and suppliers is likely to become even more prominent with the rise of decentralized finance and payments in cryptocurrencies or tokens, as it might be challenging to link a particular wallet ID with a sanctioned entity (DiCaprio, 2022). While know-your-customer guidelines apply mainly to financial industries in the context of money laundering, similar standards may need to be developed and implemented for other supply chains to reduce the risk of sanctions spreading. Although technologies such as blockchain enable the cryptocurrencies that exacerbate this challenge, they may also hold promise for helping to resolve it by increasing the traceability of supplier–customer relationships (Hastig & Sodhi, 2020). Research is needed to explore these issues and develop and test solutions.

5.2 | Proactive cooperation

Loss of access to foreign markets or critical technology is often caused by overreliance on a few major players for infrastructure and expertise. This factor is particularly relevant for SMEs. While reducing dependency on the major players may sound like an obvious risk-mitigation strategy for smaller firms, the practical realization of such a strategy is challenging. It requires coordinating a large number of firms in order to achieve reasonable economies of scale and establishing channels to share information and knowledge. A possible solution could involve establishing cooperatives of suppliers, as is common in the agriculture industry. Such cooperatives act in the interests of all members (e.g., individual farmers) and allow them to access foreign markets directly. Such cooperatives can reach a gigantic scale. For example, Fonterra Cooperative is not only the largest company in New Zealand but also accounts for more than 30% of exports of dairy products worldwide (Groeneveld, 2021). Coops must enforce strict membership criteria to reduce the risk of attracting sanctions or boycotts on the entire group. In services and high-tech industries, firms may consider creating a decentralized, autonomous organization in lieu of traditional cooperatives. On the other hand, perhaps organizing into a higher visibility, named cooperative could make sanctions or boycotts more feasible and attractive to opponents. Supply chain research is needed to explore the costs and benefits of various alliance strategies, including their effectiveness in mitigating risks from first- and higher-order sanctions and boycotts.

5.3 | Shortening supply chains

The concept of short supply chains (local sourcing) has gained traction because of potential positive social and environmental outcomes, especially for perishable products. Short supply chains can reduce product waste and loss, cut transportation time and distance, and support local communities. Meanwhile, such a strategy might increase costs by lowering economies of scale and forgoing the comparative advantages of national or regional economies. Therefore, organizations and supply chains must strike a delicate balance between potential (i.e., often uncertain) benefits and costs. A lower risk of sanction and boycott propagation through shorter supply chains is an additional factor to consider when resolving the trade-off. Shorter supply chains bring greater transparency, so any sanctioned entity can be identified early, and they rely on primarily local suppliers, thus lowering the risk of losing access to critical technology in case of international sanctions or boycotts. Further research is needed on the strengths and weaknesses of shorter supply chains in light of the risks from sanctions or boycotts.

5.4 | Network analysis

Given the critical role of logistics in physical flows, supply chains need advanced plans for alternative transportation modes and routes. Implementing or maintaining such plans may mean forgoing some economies of scale in transportation, some discounts from key suppliers, or some other benefits of a single-source approach. However, such a plan is likely to limit the losses to primary logistics nodes and transportation lines in cases of disruption. In this context, it is vital to understand the current structure of the logistics network and identify its most vulnerable nodes and links. Network analysis—node centrality analysis in particular—can shed light on how to design logistics to minimize supply chain disruption due to the unavailability of logistics providers. As such efforts may be out of reach for SMEs, network analysis could be performed for entire supply chains by industry associations, research centers, or relevant government bodies. Research is also needed to develop techniques for valuing the options created and determining the appropriate amount of "insurance" to obtain in the form of mitigation strategies and plans.

6 | CONCLUDING REMARKS AND OTHER FUTURE RESEARCH

Sanctions and boycotts can have serious, unintended effects on DEI because they spread through supply chains beyond their intended recipients and hurt other organizations—in some cases, even the sanctioners themselves. In this essay, we identified some key channels through which the effects of sanctions and boycotts propagate and proposed several ways in which supply chain practitioners may prepare their organizations and supply chains for these often-surprising spillover effects. By proposing ways to explore sanctions and boycotts at the organizational and supply chain levels, these strategies may also help policymakers and boycott organizers to minimize collateral damage beyond their intended targets.

While this essay suggests a general framework for research and practitioners, many questions remain unanswered. Certainly, more detailed guidance is needed for policymakers and managers trying to mitigate the adverse effects of sanction and boycott contagion through supply chains. A better understanding of the second- and higher-order effects of sanctions and boycotts would help to identify especially high leverage points in large supply systems. Moreover, the effect of sanctions and boycotts on supply chain sustainability is yet to be explored.

Each of the areas we outlined in this essay provides fertile ground for further study. The role of new technologies such as blockchain needs more research in the context of supply chain mapping. Strategies such as decentralized governance might facilitate supply chain cooperation but also lead to greater connectivity and interdependence of supply chain members, increasing the supply chain's vulnerability to sanctions and boycotts. Many of the trade-offs related to shortening supply chains, reshoring, or near shoring need to be explored in the face of rising economic nationalism. Applying network analysis techniques to study supply chain resilience in the face of sanctions and boycotts is likely to yield valuable insights.

It is also important to integrate existing research from outside operations and supply chain management to leverage its insights for our field. A substantial body of literature in economics and political science studies the direct effects of sanctions and boycotts and their unintended consequences on employees, communities, and other stakeholders of the targeted entities. We could adapt economic models to the supply chain context, rely on the established techniques for operationalization of the key variables, access prominent databases, and enjoy further benefits from transdisciplinary research.

This essay has focused on the unintended effects of sanctions and boycotts, treating the direct, intended ones as inevitable. However, this should not preclude research challenging this assumption and investigating and evaluating the direct effects of sanctions and boycotts on the operations of targeted organizations and their DEI implications. Similarly, the ethical dimension of imposing sanctions with knowledge of their unintended supply chain consequences, while not explicitly covered in our essay, could and should be explored in greater detail. Clearly, in our complex world of varied priorities and preferences across nations, groups, and organizations, the challenges facing operations and supply chain managers abound. We draw attention to the ironic situations of undiversity, inequity, and exclusion in supply chains wrought by the supposedly enlightened application of some common methods of economic coercion, sanctions, and boycotts. Opportunities for operations and supply chain management research in these areas are wide open and vital to practicing managers around the world.

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