

How Distortions Alter the Impacts of International Trade in Developing Countries

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Annu. Rev. Econ. 2020. 12:213–38

First published as a Review in Advance on
May 8, 2020

The *Annual Review of Economics* is online at
economics.annualreviews.org

<https://doi.org/10.1146/annurev-economics-081919-041554>

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JEL codes: F1, O1

Keywords

international trade, economic development

Abstract

Substantial research in development economics has highlighted the presence of weak institutions, market failures, and distortions in developing countries. Yet much of the knowledge generated in international trade comes from workhorse models that abstract from these frictions. This review summarizes the recent literature that assesses how these characteristics interact (or may interact) with trade reforms, resulting in different impacts in developing countries relative to what we would expect in developed countries. We discuss understudied areas that warrant further research.

1. INTRODUCTION

Over the past 4 decades, many developing countries have initiated large-scale policy reforms that lowered trade barriers. Yet despite these reforms, developing countries remain far less open to global commerce than developed ones. Import tariffs remain high, and other trade-related costs are also substantial due to weak contract and regulatory enforcement, inadequate transport infrastructure, search frictions, and other distortions.

Policies that reduce trade costs through lower tariffs and nontariff barriers remain as relevant to developing countries as ever. This stands in contrast to developed countries, where many of the gains from low tariffs and improved trade infrastructure have already been realized. Thus, despite the recent return to protectionism by some developed countries, policy makers in developing countries remain far more interested in the consequences of trade policy for their economies.

This differential interest can be formally quantified by examining the policies and policy discussions themselves. To do so, we analyze the texts of International Monetary Fund (IMF) Article IV consultations and World Trade Organization (WTO) trade policy reviews (TPRs). These two sets of reports are useful sources for comparing policies across countries because they (a) are standardized in their formats; (b) are required to be completed by all member countries, so they span the global income distribution; and (c) discuss specific economic policies. Disparities between developing and developed countries in the frequency of discussions related to international trade provide evidence that these topics are of greater importance to developing-world policy makers.

The IMF Article IVs discuss macroeconomic policies ranging from exchange rates to inflation, fiscal discipline, and international trade. The relative frequencies of the terms trade, imports, exports, tariffs, and duties provide a sense of the priority assigned to international trade relative to other macroeconomic topics. **Figure 1** reports these frequencies against countries' income per capita, and demonstrates that international trade is relatively more discussed in Article IVs for developing countries. For instance, trade-related words account for approximately 1% of Rwanda's and Bangladesh's Article IVs compared with only 0.25% for those of France and the United States.

The WTO TPRs can be used to assess the relative importance of different forms of trade policies, ranging from traditional trade instruments such as tariffs and duties to deep integration reforms that include intellectual property, data flows, and regulatory standards. **Figure 2** reveals that TPRs for developing countries focus relatively more on tariffs and duties, while reports for developed countries are relatively more focused on intellectual property, trademarks, and copyrights.

As this evidence suggests, the bulk of traditional trade policy discussions are occurring in developing countries. Understanding the impacts of these policies should be of great interest to both international and development economists. However, the core insights provided by research in international trade have been informed mostly by neoclassical trade models and by empirical patterns of trade from developed countries. Applying the lessons from these studies to developing countries requires caution, given the large differences in their economic environments. Fortunately, over the past decade, researchers have extensively analyzed trade liberalization episodes across many developing countries. This article reviews what we have learned and what remains to be learned.

We organize this review into three broad categories of frictions that the development literature has highlighted as pervasive in the developing world: weak institutions, market failures, and firm-specific distortions. While typically absent in standard models of international trade, the (primarily empirical) research we review sheds light on how these characteristics interact (or may interact) with trade reforms and globalization. In doing so, we aim to emphasize which deviations

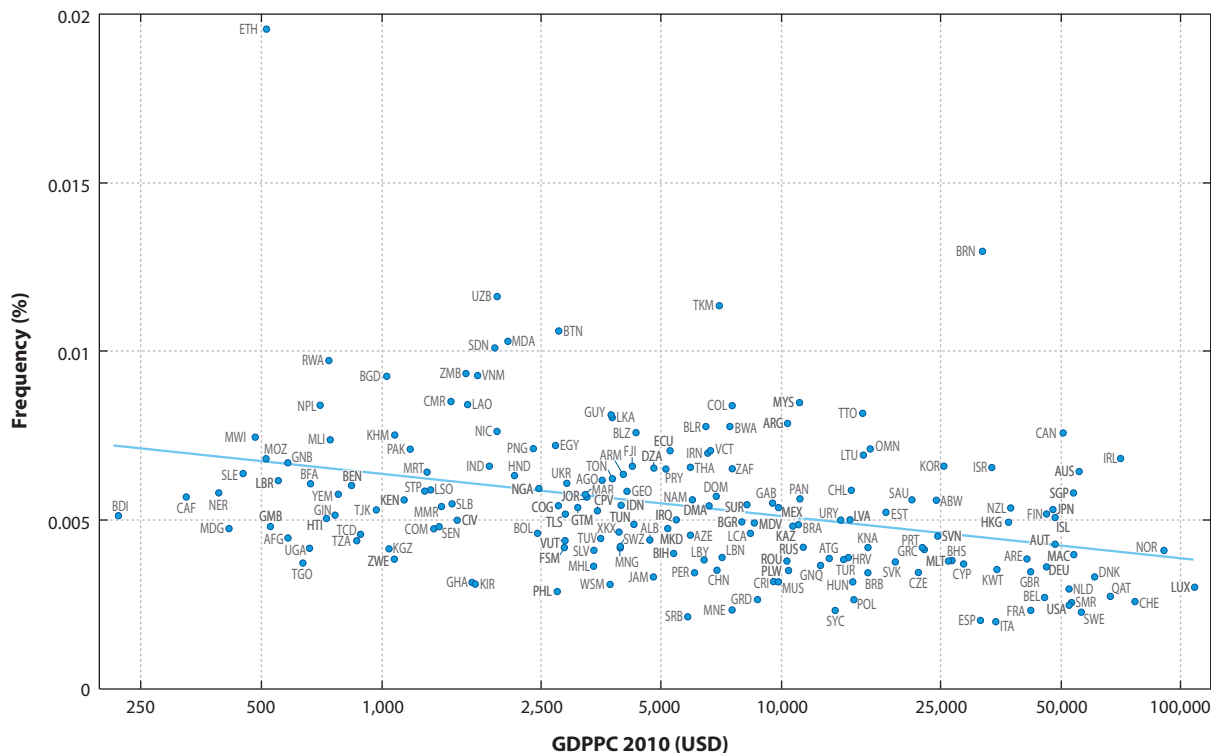


Figure 1

Frequency of trade-related words in International Monetary Fund (IMF) Article IV consultations. Country codes are from the International Organization for Standardization. The graph is created by constructing the frequency of trade-related words—“trade,” “import,” “export,” “tariff,” “duty”—from IMF Article IV consultations (<https://www.imf.org/external/np/sec/aiv/index.aspx>; data accessed 2017). The slope of the best-fit line is $-5.4e-04$ (standard error $1.1e-04$). Abbreviation: GDPPC, GDP per capita.

from standard trade models are particularly important for understanding the impacts of trade for developing countries, and to illustrate where the current stock of knowledge falls short. Such a review is of particular value for researchers seeking policy relevance who must increasingly think about trade in the context of developing economies.

Given this scope, we abstain from reviewing research that focuses on the classic questions of trade and development related to differences in preferences, endowments, or technologies between countries (e.g., predictions that arise from Heckscher–Ohlin and Ricardian models, or models of North–South trade featuring nonhomothetic preferences). Also, we discuss only briefly issues well covered by recent high-quality reviews, such as those by Harrison & Rodriguez-Clare (2010), who broadly survey the literature on solving market failures and address externalities through industrial policy, including the relevance of trade and foreign direct investment (FDI) policy levers; Goldberg & Pavcnik (2016), who survey what we know about the actual effects of trade policy and the related methodological challenges; Pavcnik (2017), who reviews the literature on the effects of trade liberalization on inequality; Nunn & Trefler (2014), who survey the literature on trade and institutions; Donaldson (2015), who explores the topic of how large the gains from market integration are; and Irwin (2019), who reviews what we know about the effects of trade on growth.

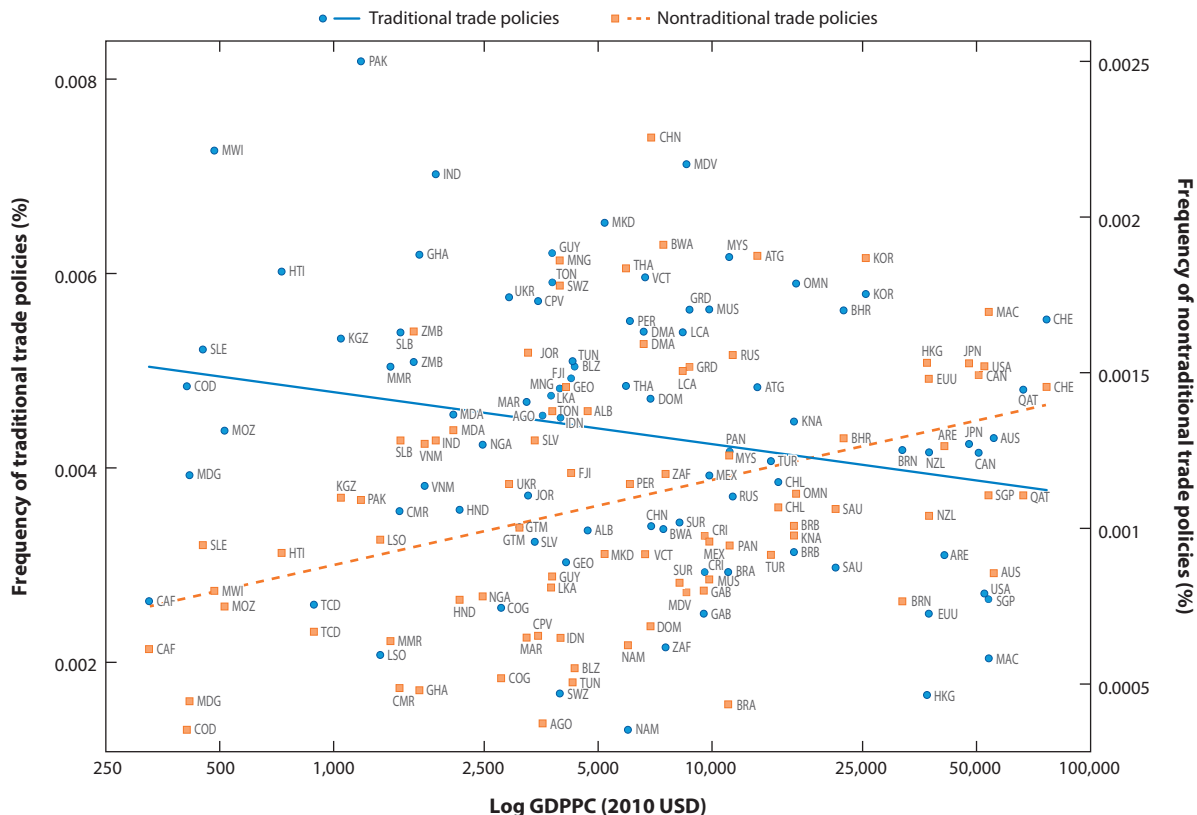


Figure 2

Trade policies in World Trade Organization (WTO) trade policy reviews. Country codes are from the International Organization for Standardization. The graph is created by constructing the frequency of traditional policies (“tariff,” “duty”) and nontraditional policies (“intellectual property,” “copyright,” “trademarks”) from WTO Trade Policy Reviews (https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm; data accessed 2017). The slopes of the best-fit lines are $-2.3e-04$ (standard error $1.1e-04$) and $1.2e-04$ (standard error $3.2e-05$), respectively. Abbreviation: GDPPC, GDP per capita.

2. WEAK INSTITUTIONS AND RULE OF LAW

A defining feature of developing countries is that they have weak institutions, with weak rule of law perhaps the most obvious manifestation. An abundance of evidence documents differences between the developed and the developing world along these dimensions (e.g., La Porta et al. 1998). Almost all transactions across and within borders rely on contracts being honored—whether they be formal or not—and rules being followed. Thus, weak institutions are likely to interact with almost every step between an entrepreneur coming up with an idea for a product in one place and the final good being purchased by a consumer in another. While, of course, institutions matter for domestic transactions, international transactions typically incur larger monetary and time costs between production and delivery, and require contracting across jurisdictions. These issues matter more than ever, given the widespread belief that entering global value chains is now a key pathway to development (World Bank 2020; but see Rodrik 2018a for a counterpoint). Beyond contracting, the literature has uncovered multiple mechanisms through which international trade interacts with weak institutions and rule of law in ways that modify the predictions of canonical

trade models. We relegate discussions of rent seeking and lobbying (which is often facilitated by weak institutional environments) to Section 4, which covers firm-specific distortions.

2.1. Tariff Evasion

The implementation of trade policy is perhaps the most direct way in which weak rule of law affects trade. Research has documented substantial tariff evasion, often accompanied by bribery at ports of entry in developing countries. This matters for trade policy. First, the missing revenues due to evasion dramatically change the calculations of the benefits of tariff policy, and if the revenue that is collected is diverted from government coffers to other actors through bribes, the distribution of those benefits will further change. Second, the inconsistent application of tariff policy potentially serves as a size-dependent distortion if particular firms are able to avoid duty payments. Third, in the presence of tariff evasion, attempts to target particular sectors through tariffs as a form of industrial policy may be ineffective.

The most common form of tariff evasion occurs through the underinvoicing of imports. Since tariffs are typically assessed on the transaction value, importers have an incentive to report a lower value on transactions to reduce their tariff payments. Evidence of this form of tariff evasion was first uncovered by Bhagwati (1964). Fisman & Wei (2004) pioneered the analysis of tariff evasion by utilizing mirror statistics. Their insight is that while importers have an incentive to underinvoice, exporters face no such incentive because they are not responsible for the tariff payment. Thus, the difference between reported export and import values—the evasion gap—could reflect tariff evasion. Unlike earlier researchers, who typically assumed that these gaps were measurement errors, Fisman & Wei (2004) demonstrate a strong relationship between the tariff rate and the evasion gap when examining trade between China and Hong Kong. Evasion also occurs when importers change the product category of the transaction to one with a lower statutory tariff rate. These findings have been replicated across developing countries, including India (Mishra et al. 2008), Tunisia (Rijkers et al. 2015), and nations in Eastern Europe (Javorcik & Narciso 2008).

Sequeira & Djankov (2014) survey imports at ports in Mozambique and provide direct evidence that customs officials work with importers to reduce official tariff payments in exchange for bribes (lowering import costs) and also regularly hold up importers by demanding additional fees to clear transactions (raising import costs). The authors' surveys reveal that firms are willing to double their transport costs to avoid this second coercive form of corruption, in part to avoid the uncertainty of bribe payments.

Sequeira (2016) argues that tariff evasion may be an important explanation for why estimates of tariff elasticities—by how much trade volumes change with tariffs—appear to be low in developing countries. Using variation in Mozambique's trade liberalization, she estimates a tariff elasticity of only 0.1, well below developed-country estimates. She documents via audits that, prior to the reform, bribes were paid on approximately 80% of shipments in order to avoid paying an onerous tariff rate. The payments were small, covering only 7% of the total tariff duties saved (an example of the Tullock paradox). When Mozambique reduced tariffs, trade volumes hardly changed, since firms had previously been evading tariffs through bribes. Thus, the tariff changes were inframarginal, so the estimate of the tariff elasticity is not particularly informative in quantifying the gains from trade using standard trade models. Put another way, Mozambique was already far more liberalized than it appeared on the basis of official tariff schedules, given rampant tariff evasion and cheap bribe prices (and, similarly, the costs of protection in these contexts would be exaggerated). Given this finding, obtaining credible estimates of trade policy elasticities in these settings is crucial for policy makers.

There is a (surprisingly) small literature that studies policies that reduce tariff evasion. Javorcik & Narciso (2017) argue that the WTO Customs Valuation Agreement, which requires countries

to use international rules to assess the price of imports in order to collect duties, reduces underreporting of prices when countries join the WTO. Yang (2008a) shows that hiring private firms to conduct preshipment inspections increases import duty collections. However, Yang (2008b) provides evidence that, in the Philippines, imports were simply rerouted to export-processing zones where duty charges could still be avoided.

The literature studying income and property tax collection in developing countries (Finan et al. 2017) could provide insights into how auditing, collecting electronic customs records, and/or addressing incentive structures within customs departments can reduce tariff evasion. For example, Chalendar et al. (2019) report early results from a project that aims to improve the incentives of customs agents in Madagascar, a country where customs revenue accounts for 44% of overall tax revenue and where losses from tariff evasion are estimated at \$96 million per year. Improving our understanding of how to effectively implement trade policy seems particularly urgent for the least developed countries. If trade policy set in the capital is not applied at the border, it is effectively irrelevant.

2.2. Contracts

As trade transactions necessarily involve substantial lags and physical distance between production and sale, strong contracts are central to many successful trading relationships. Weak rule of law makes it difficult for suppliers to contract with producers, and producers with buyers. The inability to write enforceable contracts involving developing-country firms and the resulting high risks involved have the potential to reduce the gains from trade in the absence of mitigating technologies (e.g., relational contracts).

The literature on institutions and trade has shown that weak contract enforcement distorts patterns of trade and provides a force for comparative advantage beyond standard endowment or technology stories. For example, Nunn (2007) demonstrates that countries with weak contract enforcement tend to export products that are less reliant on relationship-specific inputs. If these institutional differences exacerbate relative price differences in autarky in a Ricardian manner (e.g., by raising relative unit labor requirements for producing complex goods in developing countries), gains from trade will be magnified. However, Levchenko (2007) draws very different conclusions by modeling institutions as determining the extent of transactional impediments to combining factors of production owned by different parties. In his model, relationship-specific investments and imperfect contract enforcement lead to rents being paid to labor. When a country with weak institutions opens to trade, it specializes in the sectors that do not require relationship-specific investments and the enforcement of contracts. Developing countries can be worse off under trade if enough of the high-rent jobs are shifted abroad. Krishna & Sheveleva (2017) present a related model in which nonenforceable contracts lead farmers to specialize in low-value crops instead of high-value, export-oriented crops.

Direct evidence for how difficulties enforcing contracts affects the gains from trade for developing countries comes from Antràs & Foley (2015). They examine cross-border transactions of a US-based poultry exporter and find that only firms in importing countries characterized by weak rule of law are required to pay the poultry exporter cash in advance. These expensive contract terms reduce trade volumes. As demonstrated by Ahn et al. (2011a), trade flows are sensitive to cross-border payment terms, and the need to pay up front for cash-constrained importers may be a key barrier to trade for firms in developing countries.

This evidence paints a pessimistic picture for developing-country importers and exporters. A partial solution to difficulties with legal enforcement is self-enforcing contracts that rely on relationships and reputations. Two early empirical studies provide evidence for the importance of these

two mechanisms. McMillan & Woodruff (1999) document that trade credit in Vietnam is more readily extended to firms with greater incentives to repay: firms with limited options for alternative suppliers, firms that have a history of purchases with the supplier, and firms that have been introduced to the supplier by another manufacturer. Banerjee & Duflo (2000) present more direct evidence on the limits to contract enforcement by collecting a data set of the contract choices of Indian software firms supplying foreign buyers. Software firms with stronger reputations—measured, for example, by the age of the firm or whether the client is a repeat customer—are more likely to enter into time and materials contracts which stipulate that the client pay for any overruns (rather than fixed-price contracts, where the supplier does).

More recent research has tried to quantify the value of these trading relationships and the cost of acquiring them. Macchiavello & Morjaria (2015) focus on the large Kenyan rose exporting sector, where written contracts are impractical given the perishability of the product. Since a spot market exists alongside direct supply relationships, lower bounds on the value of the relationship can be calculated by the forgone profits when an exporter chooses to supply a direct buyer at a preagreed price when the spot-market price spikes. However, quantities supplied in direct relationships do drop during spot-market spikes. This finding implies that trade is constrained by contract enforcement difficulties and the need to satisfy incentive compatibility constraints.

In related research on Rwandan coffee producers, Macchiavello & Morjaria (2019) explore the hypothesis that relational contracting may be harder to sustain in high-competition environments because it increases the temptation to renege on relational contracts. On the consumer side, Macchiavello (2011) documents that Chilean wine exporters entering the UK market initially match with high-cost distributors who specialize in discovering new wines. Over time, the exporter's brand reputation improves, and it is able to move up to better distributors who pay higher prices and engage in long-term relationships.

Hansman et al. (2020) document a different margin for overcoming contractual frictions in the Peruvian fish meal industry: vertical integration. In response to exogenous changes in demand for high-quality fish meal from foreign markets, downstream manufacturing firms vertically integrate with upstream suppliers (fishing boats) in order to ensure the supply of fresher fish required for high-quality production. Relatedly, Macchiavello & Miquel-Florensa (2017) show that vertically integrated coffee producers in Costa Rica can sustain a larger scale of operations.

In summary, the evidence from within-firm contracts suggests large negative effects of weak contract enforcement on trade flows from and to developing countries. However, the use of relational contracts and vertical integration appears to mitigate these effects over time, making weak contract enforcement less problematic than it might appear at first. Given the increasing fragmentation of production, these issues are growing in importance and further research is needed; we refer the interested reader to Antràs (2016) for an in-depth review of related questions.

A common thread in the recent papers cited above is the analysis of transactions within specific industries or firms. We believe this is a particularly fruitful path to learn about contractual issues in production chains. Input-output tables only reveal fragmentation across coarse sectors and mask the nature of transactions (e.g., relational contracts). While external validity is a concern, generalizable patterns can emerge through multiple-industry studies.

2.3. Enforcement of Regulations

Another characteristic of developing countries is weak enforcement of regulations in areas such as pollution, child labor, and working conditions. Trade will improve matters if export-oriented firms in developing countries adhere more strongly to regulations and use cleaner technologies than typical domestic firms. Trade agreements, which increasingly go beyond tariffs and quotas,

may even drive such improvements if developed-country labor groups lobby to insert strong labor and environmental standards in order to prevent capital from racing to the bottom. However, the impacts of trade may be pernicious for developing countries if they lead to reallocations of labor and capital into polluting sectors or those with poor work conditions. Rodrik (2018b) argues that redistributive gains via profit shifting to developed countries may dwarf any direct gains from tighter regulatory standards in developing countries. In one of the few rigorous studies of cross-border regulatory enforcement, Chaudhuri et al. (2006) estimate substantial losses to Indian consumers in the market for quinolones from enforcing intellectual property mandated by the WTO.

Edmonds & Pavcnik (2005) explore the impacts of removing rice export quotas on child labor in Vietnam. Removing the export quotas reduced the domestic supply of rice and raised domestic prices. These authors demonstrate that the income effects from price increases dominate, and child labor declines among net rice producers. In a follow-up paper, Edmonds & Pavcnik (2006) provide cross-country evidence that international trade lowers the overall incidence of child labor. Thus, these two papers suggest the claims that international trade exacerbates (or even perpetuates) child labor are inconsistent with the evidence.

Where governments lack the capacity to enforce regulations, multinational corporations (MNCs) may privately enforce standards if they believe that the reputational risk from media exposure of poor working conditions or an industrial disaster exceeds the costs of implementing stronger protections to health and safety. Three studies suggest that trade, through the incentives of MNCs working in the country, may lead to better enforcement of regulation in contexts where government capacity is weak.

Harrison & Scorse (2010) find that export-oriented textile, footwear, and apparel firms in Indonesia targeted by antisweatshop activists in the 1990s raised wages by 10–20% (with no effect on employment). However, profits among these firms declined, potentially foreshadowing future job losses as MNCs relocate elsewhere. Using a novel survey of working conditions, Tanaka (2019) finds that Myanmar firms that export to high-income countries experience large improvements in both wages and working conditions (e.g., fire safety, health care, union recognition). In fact, labor standards of domestic firms rise to the levels of MNCs operating in Myanmar. This is in part because of improvements in management practices but also because foreign buyers demand audits of their foreign suppliers, which serve as an alternative monitoring regime for exporters. Boudreau (2019) implements a randomized trial to study how effective MNCs are at enforcing local labor laws on their suppliers. Bangladesh requires factories to form worker–manager safety committees, yet few firms comply. By randomizing which suppliers were initially targeted, Boudreau shows that a new program being rolled out by an alliance of MNCs to enforce compliance is effective. Treated factories have increased compliance with the law without any detectable impact on productivity, wages, or employment.

The most-studied area relating trade to enforcement of regulations is pollution regulation, and whether trade exacerbates pollution by moving industry to less regulated locations—the pollution haven hypothesis. As this topic is well covered by other reviews (e.g., Cherniwchan et al. 2017), we do not cover environmental regulation here. Similar haven forces may operate through trade shifting workers into sectors with child labor or poor working conditions, although we are not aware of any research quantifying these effects.

Finally, one reason developing countries maintain high tariffs is because duties are relatively easily collected on observable imports at a few major ports of entry by a small number of officials. In contrast, tax collection from domestic firms and individuals is costly and challenging in settings where most businesses are informal and most people are self-employed. In the absence of complementary reforms to broaden and deepen the tax base, trade liberalizations can impose

large and negative fiscal consequences in developing countries. Cage & Gadenne (2018) find that in the post-1970 period, 45% of countries that liberalized tariffs were unable to recover the lost revenue 5 years after the reform, and 20% have yet to regain the lost revenue. Thus, despite generating substantial distortions, high tariffs may perpetuate because they are the best revenue-raising instrument available to governments in very low income countries.

In summary, the evidence presented above suggests that trade is potentially a force for improving enforcement of labor regulations because developed-country consumers and workers value enforcement more than local agents do. Yet, MNCs still struggle with monitoring and enforcing regulations in markets where the government is a reluctant (or incapable) partner. As the 2013 Rana Plaza building collapse in Bangladesh revealed, these issues have aggregate consequences for developing countries if MNCs reallocate production chains to countries with stronger regulations. More generally, we know little about whether trade on net increases or decreases the number of workers toiling under poor working conditions.

2.4. Trade, Growth, and Institutional Change

For the reasons discussed above, as well as weak property rights and shareholder protections, the gains generated by access to trading opportunities may be very different for developing countries. These differential gains can be exacerbated if trade acts as a force for changing institutions themselves. Indeed, in their review of the trade and institutions literature, Nunn & Trefler (2014, p. 309) argue that “the impact of international trade on domestic institutions is the single most important source of long-run gains from trade.”

Acemoglu et al. (2005) make the point that the gains from Atlantic trade between 1500 and 1800 are too large to have come simply from static gains from trade. They argue that Atlantic trade strengthened the merchant class in countries where political institutions already placed constraints on the monarchy. The merchant class’s increased political power brought about improvements in property rights that made future growth possible. Levchenko (2013) formalizes a related idea by combining his earlier model, discussed in Section 2.2, with a political economy game. Trade changes the distribution of rents and thus the institutional choices made by governments that are swayed by rentier lobbying. Pascali (2017) provides evidence consistent with these mechanisms by showing that changes in trade access due to the invention of the steamship had negative growth impacts on poorer countries, particularly those with weak constraints on executive power, and positive impacts on richer countries with strong constraints.

More direct evidence that trade can change institutions is provided by Jha (2015), who shows that ownership of assets in overseas joint-stock companies significantly increased individual support for constraints on the executive. Widening ownership increased the number of supporters. Puga & Trefler (2014) follow a similar logic and show that Venetian trading opportunities in the tenth through twelfth centuries led to a broad-based merchant class that pushed for constraints on the executive class and establishment of robust contracting institutions. In the long run, however, wealth concentrated in a narrower set of merchant families who formed a (growth-inhibiting) oligarchy.

In summary, there is growing evidence that the gains from trade are larger in stronger institutional environments, and trade itself may improve the quality of institutions. As the effects of trade through changing institutions potentially swamp static gains, it is very surprising that there is not more work on this topic. Since institutions evolve slowly over time, studies have explored historical episodes. But, perhaps, there is something systematic to be learned from the more recent past, particularly the experiences of East Asian countries that have developed rapidly alongside spectacular export growth.

3. MARKET-LEVEL DISTORTIONS

Market-level distortions such as poorly functioning credit or labor markets are extensive and well documented in developing countries. These distortions make it difficult for firms and workers to take advantage of trade opportunities and thus directly alter the magnitude of the gains from trade. Relatedly, economists have long known that in the presence of such distortions, reducing trade barriers to better align domestic and world prices can actually lower welfare by exacerbating these other distortions (Bhagwati & Ramaswami 1963). The possibility that trade magnifies or alleviates existing distortions is particularly relevant for the developing world.

We summarize recent empirical research that explores how trade barriers affect economies in the presence of factor market distortions. We further consider the emerging literature that studies the implications of information and knowledge frictions. Although the distinction is sometimes murky, here we restrict our attention to market-level distortions that equally constrain all firms in the economy. In Section 4, we turn to firm-level distortions that differentially affect certain firms (or possibly sectors) and so lead to misallocation or justify firm-specific interventions.

3.1. Labor Markets and Human Capital

Although beyond the scope of this review, a large literature has found little support for the Stolper-Samuelson prediction that trade should reduce the skill premium in the developed world (for comprehensive reviews, see Goldberg & Pavcnik 2007, 2016; Pavcnik 2017). Many explanations do not appeal to market distortions. Examples include papers by Verhoogen (2008), who shows that export markets demand high-quality goods that in turn require skilled workers; Bustos (2011), who illustrates the complementarity between trade-induced technology upgrading and skilled labor; and Feenstra & Hanson (1996), who find within-industry relative price effects. Two prominent explanations that do appeal to labor-market distortions are the presence of large informal labor markets and limited labor mobility in developing countries.

Informality is a defining feature of labor markets in developing countries. Goldberg & Pavcnik (2003) formalize the hypothesis that international trade could exacerbate informality as firms cut costs in response to import competition, but they do not find strong support for this view in Brazil and Colombia. However, subsequent research by Dix-Carneiro & Kovak (2019) finds increases in informal employment in Brazilian regions that experienced larger tariff cuts, potentially acting as a buffer for workers who experience displacement from trade.

While barriers to labor mobility are not specific to developing countries, within-country language barriers, poor infrastructure, and a reliance on kin or ethnic networks in lieu of a social safety net are forces that constrain mobility more in poorer countries. Additionally, some countries, like China and Vietnam, explicitly regulate within-country labor mobility by tying access to public services and employment to a household's official residence. Consistent with the more limited mobility in developing countries, Artuc et al. (2015) find that sectoral mobility costs are higher in developing countries.

A consequence of this limited mobility is that trade reforms may have very different geographic and sectoral incidence. Topalova (2010) examines the impact of India's unilateral trade liberalization on poverty across Indian districts. She finds that districts relatively more exposed to liberalization experienced slower declines in poverty, which she attributes to the lack of labor mobility across regions in India. Furthermore, she finds that the negative consequences of trade are relatively larger in states with more stringent labor laws that make it difficult to fire workers (and thus impede reallocation within locations). Kovak (2013) and Dix-Carneiro & Kovak (2019) document similar patterns for Brazil, with distributional effects growing rather than attenuating over time (potentially due to sluggish reallocation of capital across regions or due to agglomeration forces)

and persisting 20 years after liberalization. Dix-Carneiro (2014) adopts a structural approach to trace out the dynamics of labor-market adjustment and finds that, because of high mobility costs to switch sectors, potential aggregate welfare gains from trade are significantly reduced. These papers suggest that complementary domestic reforms that lower the costs of labor mobility across sectors and regions could raise the short- and medium-run gains from trade reforms.

The effects of trade on educational acquisition link these local labor-market effects to other frictions, which we cover below. Edmonds et al. (2010) show that import competition in India leads parents to remove children from school to save on fees in the absence of well-functioning credit markets. Atkin (2016) finds that export manufacturing job opportunities in Mexico also reduce school acquisition, but in this case by raising the opportunity cost of schooling for working-age youths attracted to manufacturing work. The possible distortion in the latter case is that youths may be poorly informed about the long-term wage consequences of forgoing school (as shown in Jensen 2010) or are simply more myopic when young.

We see future research in this area extending along several fronts. First, labor-market policies—union representation, minimum wages, social security obligations, and the flexibility to hire and fire workers—vary substantially across developing countries (Freeman 2010). These policies may distort factor allocations but also provide social protections to workers on the edge of poverty. Enforcement of existing laws also varies widely across and within countries, potentially allowing the informal sector to serve as a buffer to shocks or simply adding further firm-level distortions (see Dix-Carneiro et al. 2019 for a first pass at this issue). While recent research in international trade, inspired by the empirical papers described above, explores the spatial variation in the gains from trade caused by limited labor mobility, it has largely abstracted away from the complementarities between these types of labor-market policies and trade reforms (Ruggieri 2019 and Tian 2019 are recent exceptions). We also know very little about the effectiveness of policies and technologies designed to improve labor mobility in developing countries.

3.2. Capital Markets

A major theme in development economics is that financial market failures limit firms' access to scarce capital (e.g., Djankov et al. 2007), which has particular impacts on trade flows for two reasons. First, credit is a vital lubricant for trade, since inputs must be purchased and goods dispatched long before final payment is received by the producer. Second, the trade literature has highlighted that importing and exporting products require paying substantial fixed costs up front. For example, Das et al. (2007) estimate that the fixed costs for a Colombian chemical factory to enter a new market exceeds \$1 million. Recent research explores how credit constraints interact with international trade through these fixed costs (see Foley & Manova 2015 for a more comprehensive review).

If firms are constrained in their access to finance, it is straightforward to see how capital market distortions raise the barriers to trade. Manova (2013) formalizes this argument in a heterogeneous-firm model of trade. In her framework, firms require external financing to cover the fixed costs of exporting, and credit constraints raise the productivity cutoff necessary for firms to enter the market. As such, credit constraints impact not only firms' export volumes but also the selection of firms that venture into exporting. Paravisini et al. (2015) extend this line of inquiry by studying the large credit supply shock that Peru experienced during the 2008 global financial crisis. They exploit data on firms' relationships with banks to show that firms linked to shocked banks reduced their exports to existing clients.

A less-studied friction related to capital markets occurs in the form of currency invoicing behavior. Gopinath (2015) reports that the vast majority of developing countries' imports and exports

are invoiced in a foreign currency, typically the US dollar, which has implications for the transmission of exchange-rate shocks to the border and domestic prices. Imports that are priced in the producer's currency will exhibit a high-exchange-rate pass-through in the short run (Gopinath et al. 2010). This observation implies that the inflation rate will be more sensitive to the exchange rate in countries where imports are invoiced in a foreign currency (and exports less sensitive).

We believe future research in this area will advance along several fronts. First, assessing the impacts of credit constraints is challenging because credit-constrained firms differ from unconstrained firms along many dimensions. The most direct way to assess potential biases would be through randomized trials that provide a subset of firms with liquidity to assess the impacts on those firms' exports. Second, there is very limited research on trade credit, despite its potentially central role in facilitating trade and anecdotal evidence that suggests great difficulties and cost to obtain such credit in the developing world. Third, much of the recent work on credit constraints in trade treats the distortion at the market level, rather than as a size-dependent distortion. The latter introduces the possibility that capital is misallocated across firms (see further discussion in Section 4). Fourth, the motivations for and implications of currency invoicing, financial and operational hedging strategies, and foreign currency borrowing have largely remained outside the purview of the trade and development literatures.

3.3. Material Markets

Between the 1950s and 1980s, many, if not most, developing countries pursued import substitution policies that placed onerous restrictions, high tariffs, or outright prohibitions on importing key intermediate inputs that were seen as stepping-stones to industrialization (Krueger 1984, Irwin 2019). Given the failures and later abandonment of these policies, it is likely that they induced substantial distortions to input markets by raising the cost of key intermediates and, in many cases, cutting off the supply of high-quality intermediates to the domestic market. A large body of research explores the impacts of major liberalizations in the 1990s and 2000s that removed these barriers and prohibitions on input trade. For example, Goldberg et al. (2009) note that India's much-studied unilateral trade reforms in the 1990s primarily reduced tariffs on imported inputs, and that the vast majority of imported inputs were products and varieties not previously imported.

Amiti & Konings (2007) and Topalova & Khandelwal (2011) show productivity improvements from input tariff cuts by constructing firm-level exposure to input tariffs using input-output tables in Indonesia and India, respectively. Using Hungarian data, Halpern et al. (2015) document that imported inputs are imperfect substitutes for domestic inputs and are of higher quality. Imported varieties raise firms' revenue productivity, and the authors attribute one-quarter of Hungarian productivity growth during the 1993–2002 period to the increased use of imported inputs.

Subsequent research has explored the link between intermediates and directly observable measures of firm performance. Kugler & Verhoogen (2012) provide a theoretical foundation and empirical evidence supporting the key role of input quality in producing output quality. Goldberg et al. (2009) provide evidence that lower input tariffs expanded the range of domestic products manufactured by Indian firms. Their evidence shows that access to new imported varieties, rather than price declines of existing inputs, were key, and De Loecker et al. (2016) demonstrate that these lower input tariffs reduced output prices. Gopinath & Neiman (2014) exploit the 2000–2002 Argentine peso depreciation to demonstrate that worsening terms of trade can generate large productivity losses, as higher import costs raise output prices and reduce firms' scale. There is also mounting evidence that high-quality inputs from developed countries spur exports from developing countries (e.g., Manova & Zhang 2012, Kugler & Verhoogen 2012).

Researchers have recently gained access to firm-to-firm transaction data, often originating from value-added tax records, allowing a deeper understanding of how buyers and suppliers interact within production networks. To date, most of the research has been on developed countries (for a survey, see, e.g., Bernard & Moxnes 2018), where frictions and distortions in input markets are likely small. One exception is a paper by Huneeus (2019), who shows strong propagation of trade shocks through the Chilean production networks due to frictions in finding new buyers.

As more developing countries provide researchers with access to such data sets, our understanding about how input market distortions affect firm productivity in developing countries will further improve. (An important caveat is that these data almost always miss transactions with and among the informal sector, with the Indian example studied in Gadenne et al. 2019 an exception.) A recent and complementary theoretical literature explores the possibility that input market distortions, which could include trade barriers but also contractual frictions and imperfect competition, can compound over input–output linkages (e.g., Liu 2019). The possibility that the distortions compound implies that targeting distortions with high distortion centrality, which are typically those in upstream sectors, can deliver large improvements in aggregate productivity. Bringing this literature together with the firm-to-firm transaction data described above is a promising area of future research.

3.4. Land, Energy, and Other Factor Market Distortions

A large literature has established that developing countries are plagued by unenforceable or customary property rights, expropriation risk, and poorly functioning land-titling systems, all of which impede land transactions (Besley & Ghatak 2010). There are additional bureaucratic hurdles and red tape that prevent converting the usage of land (e.g., from agriculture to manufacturing). Electricity is an equally important input into production that is unreliable and either expensive or rationed due to a combination of poor regulation, transmission losses, and political failures that allow nonpayment or outright theft (e.g., Allcott et al. 2016). These issues, as well as other factors such as access to water, constrain the ability of firms in the developing world to achieve scale economies and compete successfully on international markets (see Abeberese 2017 for evidence in India). However, we are not aware of any research that specifically explores how these constraints interact with trade.

One policy response to overcome these factor market distortions has been to create special economic zones (SEZs). Despite their costs and uncertain benefits, SEZs have become a prominent policy used by governments to attract foreign investment and to spur exports (Duranton & Venables 2019). In developing countries, SEZs serve to address multiple market distortions by lowering trade and regulatory costs (through one-stop shops that reduce bureaucratic red tape or special tariff regimes), by facilitating access to land and reliable electricity, and in some cases by allowing for more flexible labor regulations (Khandelwal & Teachout 2016). Yet, despite their widespread use, SEZs have not been extensively studied in the international trade literature; one exception is a paper by Wang (2013), who exploits the timing of SEZ creation across Chinese municipalities to assess impacts on exports and FDI. This subject warrants much more academic attention, given the number of policy makers recommending the use of SEZs and the lack of systematic evidence on the costs, benefits, and overall impacts of SEZs.

3.5. Imperfect Competition and Markups

Rodrik (1988) and Tybout (2000) argue that too much trade policy analysis is based on insights derived from models of perfect competition. The resulting advice may be inappropriate for

developing countries, where many markets are imperfectly competitive and antitrust is typically nonexistent.

A long-standing view is that trade liberalizations increase domestic competition and reduce markups, and pioneering research by Levinsohn (1993) and Harrison (1994) found support for this hypothesis in Turkey and Côte d'Ivoire, respectively. More recently, Edmond et al. (2015) develop—and test on Taiwanese data—a model in which the procompetitive effects of trade both lower markups and reduce markup dispersion by exposing the previously dominant producers to greater competition. Trade reforms also lower prices of inputs, as noted above, and De Loecker et al. (2016) examine how prices, markups, and marginal costs adjusted in response to India's dramatic reductions in input tariffs. Recovering markups from production data via first-order conditions, they estimate a median markup across all sectors in India of 34% of costs. While prices declined relatively more in sectors that experienced larger tariff cuts, consistent with the procompetitive effects of trade, costs fell even further because of declines in input tariffs. As a result, markups actually increased in response to India's trade liberalization.

Atkin et al. (2015) take a direct approach to measuring markups in a sample of soccer ball exporters in Pakistan. They ask firms their markups and find that high-quality balls command higher markups and that the median is low at 8.6% of cost. However, the dispersion in markups across firms is large—the standard deviation of markups is approximately equal to the median. In fact, this markup dispersion exceeds dispersion in manufacturing costs and is more strongly correlated with firm size. These results suggest that marketing efforts play a key role in export success.

To shed further light on the relationship between trade, markups, and the degree of imperfect competition, we see high value in future studies focusing on specific industries. Such a focus will allow for a deeper understanding of industry costs and the appropriate shape of the production function, as well as potentially more accurate collection of cost and price data, and even the firm's perceived markup (which is presumably the object the firm adjusts in response to economic conditions). Finally, the finding that trade affects not only levels but also the dispersion of markups has implications for misallocation, a topic we focus on more directly in Section 4.

3.6. Domestic Trade Frictions

Another typical feature of developing countries is the high cost of moving goods within the country, due to both poor infrastructure and chains of (often imperfectly competitive) middlemen. These high costs directly distort production and supply-chain decisions; reduce the ability to produce at scale; and have distributional ramifications for the gains from trade that are absent from trade models that abstract away from domestic geography, distribution, and retail.

As evidence for these high costs, Atkin & Donaldson (2016) use variation in price quotes across Ethiopia and Nigeria (purged of intermediary markups) to document that the marginal costs of distance are three to five times higher in sub-Saharan Africa than in the United States. Donaldson (2015) reviews the literature on the gains from market integration via improved infrastructure.

Coşar & Fajgelbaum (2016) explore the implications of high internal trade costs in modifying the gains from trade. Export-oriented firms locate by the coast to access foreign markets and draw mobile factors from the autarkic interior. The gains from (external) trade liberalization are reduced in this model, with absolute losses to immobile factors in the interior. Furthermore, Fajgelbaum & Redding (2018) show that internal trade costs can retard the process of export-induced structural development by keeping land cheap relative to labor in remote locations. In contrast, Allen & Atkin (2016) demonstrate that high trade costs can provide insurance to farmers in the sense that local prices rise more when yields are low.

A substantial literature highlights the prevalence and importance of middlemen in the developing world. Ahn et al. (2011b) hypothesize that small exporters use intermediaries to save on trade costs or access more difficult markets, and provide supportive evidence from Chinese firm-level data. If the trading sector is perfectly competitive, many layers of intermediaries act as a price wedge between domestic markets, raising internal trade costs. However, Atkin & Donaldson (2016) find imperfect competition in the trading sector to be pervasive, particularly in remote locations. This combination of high trade costs and a lack of competition in trading and distribution alters the distributional impacts of trade to the detriment of remote locations, which experience smaller gains from reductions in port prices than less-remote places and whose consumers receive a smaller share of the pie vis-à-vis intermediaries. This finding echoes that by McMillan et al. (2003), who show that farmers saw little benefit to removing export restrictions in Mozambique's cashew sector, as middlemen passed through little of the price rise (alongside urban unemployment generated by the closing of cashew processing plants). Fafchamps & Hill (2008) document low pass-through from international prices to Ugandan coffee farmers, although they conjecture that this comes partly from excess entry of small traders increasing search costs for traders. Bergquist & Dinerstein (2019) show that only one-fifth of an experimentally induced cost reduction is passed through to Kenyan consumers, and experimentally induced entry of additional traders has little benefit because the new traders quickly collude with incumbents. Finally, Dhingra & Tenreyro (2017) argue that pass-through of world prices to farmers depends on the degree of monopsony power of large agribusinesses, which are becoming increasingly common in developing countries. They find that when world prices rise, Kenyan farmers selling to these large buyers see incomes rise by a third less than those selling through small traders.

Turning to theoretical advances, Antràs & Costinot (2011) show that international trade can generate absolute losses for the developing world if developed-country traders with strong bargaining positions come to dominate developing-country markets. Bardhan et al. (2013) explore a setting where consumers are uncertain of product quality and so producers rely on middlemen with reputations to sell their products. Thus, middlemen obtain reputational rents, and these rents can skew the distribution of the gains from trade in favor of middlemen.

One solution to intermediary market power takes the form of programs such as Fair Trade certification that guarantee minimum prices to producers and may help organize and provide public goods to groups of farmers. The effectiveness of such programs is still in question; for a review of this nascent literature, see Dragusanu et al. (2014) (also see Dragusanu & Nunn 2018, Macchiavello & Miquel-Florensa 2019).

The role of the final link in the distribution chain—the retail sector—has received less attention despite retail appearing to be highly inefficient and uncompetitive in developing countries. Notable exceptions are papers by Javorcik & Li (2013) and Iacovone et al. (2015), who document that entry of foreign retailers into Romania and Mexico, respectively, induced domestic suppliers to raise productivity and improve logistics. Lagakos (2016) suggests that rather than frictions impeding the adoption of modern retail technology, the lack of cars among the poor impedes supermarket-style retail. Atkin et al. (2018) show substantial improvements in welfare with the entry of foreign retail into a middle-income country, Mexico. These gains are driven primarily by 30% of consumers switching their purchases to foreign stores as well as procompetitive reductions in prices by domestic competitors. Suggestive of the lack of competition in the retail sector in developing countries, these two effects are more than twice as large as comparable estimates of Walmart's impacts when entering US towns. Beyond foreign entry, e-commerce may be a partial solution to high retail prices, as shown by Couture et al. (2020).

Finally, high internal trade costs coupled with poverty lead to small and segmented markets. Similar to infant industry arguments, these segmented markets reduce the ability of

developing-country firms to exploit economies of scale that may be necessary to be internationally competitive. Bigsten et al. (2004) touch upon this point while exploring learning by exporting in African manufacturing; however, we believe that these limited opportunities for scale deserve more attention.

In summary, there is strong evidence of large internal trade costs in the developing world coupled with imperfect pass-through due to imperfectly competitive trading and retail sectors. These findings should certainly make us cautious when interpreting welfare and distributional impacts of reforms from border price changes (i.e., by assuming perfect pass-through from border to consumer). However, further research is needed to establish more reasonable assumptions. At the same time, we know little about effective policy remedies for the lack of competition in the trading and distribution sectors.

3.7. Information and Knowledge Frictions

Recent research has documented potentially severe information frictions in developing countries that may impede trade substantially more than trade frictions such as tariffs. These frictions reflect the high costs of search and matching across and within borders and the high costs or market failures in the provision of technologies to alleviate these frictions.

Allen (2014) studies information frictions in regional agricultural trade within the Philippines. He documents that observed freight costs cannot fully explain why trade flows decline with distance or why regions simultaneously import and export the same commodity. These facts can be explained by producers searching markets (at a cost) until they find an acceptable price, and his estimates reveal that information frictions account for half of the observed spatial price dispersion.

Startz (2018) examines the trading decisions of Nigerian wholesalers. Her tailored, transaction-level surveys demonstrate that wholesalers frequently travel on expensive international trips to meet sellers, costing around 10% of the value of the eventual shipment. They do so repeatedly, even when not changing suppliers, consistent with travel being used to find novel products rather than to find or learn about suppliers (indeed, the goods they bring back are 2.5 months ahead in terms of innovation/style and sell for 12% more). In a historical context, Steinwender (2018) and Juhász & Steinwender (2018) analyze the impacts of information frictions on trade flows by exploiting the arrival of the telegraph.

Atkin et al. (2017) explore search and matching frictions via a field experiment conducted in Egypt. Along with a local intermediary and a nongovernmental organization, they obtained export orders for handmade rugs from high-income countries. The intermediary sourced production of these rugs from a random sample of small-scale rug manufacturers. The treatment provided firms with the opportunity to produce for export markets, that is, reducing matching frictions between them and sophisticated foreign buyers. Detailed surveys showed large impacts of exporting in the treatment group relative to control firms: Profits increased by 15–25%, and quality levels rose dramatically, when identical rugs were made in a lab setting. Records of meetings between buyers, intermediaries, and firms suggest that knowledge flows drive these quality changes. In particular, firms learn about preferences of foreign buyers (e.g., that the rugs need to be completely flat) and how to manufacture high quality (e.g., packing the threads too tightly causes warping).

The effects documented by Atkin et al. (2017) are a textbook example of the elusive learning-by-exporting phenomenon. A survey by Wagner (2007) offers mixed evidence supporting a causal relationship between exporting and productivity. Supporters argue that this phenomenon is most relevant for developing countries that have more to learn (e.g., De Loecker 2007, Fernandes & Tang 2014).

Why learning by exporting can occur is a separate question.¹ If exporting forces firms to improve efficiency by cutting slack, why did they operate inside the efficiency frontier prior to exporting? Perhaps behavioral economics may be useful in answering this question (e.g., Kremer et al. 2019). Atkin et al. (2017) highlight a different mechanism: flows of information that are not priced, the mechanism in the classic learning-by-exporting literature (e.g., Clerides et al. 1998). The fact that the value to the firm of this knowledge on the domestic market exceeds the intermediaries' cost of provision suggests failures in the market for knowledge in this setting. Similar mechanisms are at play in studies that explore knowledge flows to domestic firms as a result of FDI (e.g., Javorcik 2004 in the context of vertical supply linkages) although the evidence here is mixed (Harrison & Rodriguez-Clare 2010).

A related line of research explores information frictions in the adoption of modern management practices. Bloom et al. (2013) conducted a randomized controlled trial among Indian textile firms to test the hypothesis that adopting modern management practices can improve productivity. Firms that were offered free management consultancy experienced a 17% improvement in productivity. The authors conclude that information frictions are the most plausible explanation for why poor management practices persist: Many firms in their sample were unaware of either the impacts or existence of these improved management practices. As above, the absence of low-cost consulting providers is puzzling in this context and suggestive of market failures, potentially due to worries regarding blackmail, corporate espionage, or reputation issues.

Bloom et al. (2020) study the long-term impacts of their management experiment. Interestingly, treated firms had 41.6% higher export volumes and were 18.9% more likely to export relative to control firms. A related paper by Bloom et al. (2018) examines the relationship between management practices and export patterns in the United States and China. The authors find that management practices matter more for Chinese export outcomes, particularly with regard to production efficiency and product quality.

In summary, an emergent literature shows that information frictions, either through high costs of search and matching or through direct knowledge barriers, are important constraints that inhibit trading opportunities for firms in developing countries. Yet, given their potential importance relative to extensively studied trade frictions, we still know very little about their nature, their consequences, and what sorts of specific policy interventions can alleviate them.

4. FIRM-LEVEL DISTORTIONS

The discussion in the previous section focuses on market-level distortions. We now turn our attention to distortions that affect firms (or possibly sectors) to differing degrees and how such distortions interact with international trade. An implicit assumption in standard models of trade is that resources are efficiently allocated across firms and sectors, at least conditional on trade costs. Yet, a large body of research has argued that firm-specific frictions or taxes are particularly prevalent in developing countries, resulting in the misallocation of factors of production (e.g., Banerjee & Duflo 2005, Hsieh & Klenow 2009).

A robust prediction from a broad class of trade models (Mrázová & Neary 2018) is that trade leads to the expansion of larger firms relative to smaller ones. If we believe that small and unproductive firms are abundant in developing countries because they have preferential access to capital, benefit from barriers to entry, or receive favorable tax treatment, then trade reforms will tend to be efficiency enhancing. If, instead, we think that red tape, crony capitalism, and lobbying

¹Of course, exporting may incentivize investment in new technologies, the hiring of skilled workers, and so on, but accurately measured productivity conditions on these changes.

result in small firms facing larger frictions, trade will tend to increase misallocation. A similar logic applies across sectors—that is, sets of firms that potentially face similar distortions—depending on whether comparative advantage sectors are more or less distorted. We summarize the small literature that focuses on this interaction between trade reforms and firm- and sector-dependent distortions.

4.1. Small and Informal Firms

The vast majority of firms in developing countries are small and informal. For example, Hsieh & Olken (2014) document that nearly all firms in India and Indonesia have fewer than 10 workers, and Nataraj (2011) shows that the median manufacturing firm in India is informal, has two employees, and has \$235 in capital. Small firms have low value added per worker and typically operate informally, avoiding both taxes and regulatory barriers.

Despite the overwhelming dominance of small firms and their perceived drag on aggregate productivity, there is little research on how trade affects firm size distribution in developing countries. On the one hand, since informal firms do not face labor-market regulations or other regulatory barriers, the increased import competition resulting from trade reforms may expand the informal sector, as it can quickly absorb workers shed by the formal sector. On the other hand, informal firms may contract if they are particularly prominent in importing competing products or if they compete in factor markets with (formal) exporting firms.

Nataraj (2011) examines how India's major trade reforms affected informal firms. She finds that declines in tariffs on final goods raised productivity among informal firms and that the smallest and least productive firms exited the market. However, the inability to follow firms over time or to see them switch in and out of formality makes isolating mechanisms difficult. McCaig & Pavcnik (2018) provide a more comprehensive analysis. The US–Vietnam Bilateral Trade Agreement expanded market access for Vietnamese firms by lowering the US tariffs on their exports. Since informal firms are typically too small to cover the fixed costs of exporting (and typically need to be formal to navigate export procedures), the removal of trade barriers benefits primarily larger firms. McCaig & Pavcnik (2018) find that the impacts on informal firms come from formal-sector firms expanding with greater market access and pulling workers from informal firms, mainly in the same industry (the second mechanism described above). Since formal firms are substantially more productive, this shift raises aggregate productivity. There is also evidence of reduced misallocation, since formal firms have higher average revenue products of labor, consistent with these firms facing larger distortions.

The link among trade, informality, and firm size distributions remains very much an open area of research. For example, there are multiple margins of informality (e.g., hiring workers off the books, as in Ulysea 2018, or circumnavigating labor laws by hiring contract labor, as in Bertrand et al. 2017) that remain unexplored in a trade context. Further studies providing well-structured evidence on the links among trade, firm size distributions, and misallocation are also much needed.

4.2. Politically Connected Firms

Many industries in developing countries are dominated by politically connected firms, often in the form of state-owned enterprises (SOEs). Political influence also stems from large business groups owned by political parties, through state-owned banks that can account for a large share of credit to the private sector, and through crony capitalism. These organizations may maximize objectives determined by the state (either local or national) that go beyond profit. A prevailing view in economics is that these political connections lead to a large misallocation of resources.

A handful of recent papers explore how international trade affects misallocation through its impacts on state-owned firms. Large, state-run firms do not map easily onto standard models of firm heterogeneity, as these firms are well capitalized and large but often extremely inefficient (in standard models, large firms are the most productive). Thus, it is not clear *ex ante* whether these firms will expand or contract with trade liberalization. Zhu Rongji, a former premier of China, used the phrase “rapid waters should wash away dirty sands” to describe the potential impacts of China’s WTO accession on its SOEs. In this view, lower trade barriers can drive out inefficient SOEs. However, SOEs may be some of the only firms with sufficient capital to take advantage of improved export opportunities or absorb competitive pressures from imports. These firms may also have strong-enough political connections to keep themselves entrenched.

Khandelwal et al. (2013) study the consequences of trade liberalization in a sector with a large presence of state-owned activity: China’s textile and clothing (T&C) sector. Prior to 2005, some of China’s T&C exports were subject to quotas. Standard heterogeneous-firm models predict that the most productive firms would buy the export licenses and that, when the quotas were removed, these incumbent firms would expand. Instead, unproductive SOEs obtained a large share of export licenses, and upon liberalization, there were substantial market share reallocations toward new and more productive private-sector enterprises. The authors’ estimates suggest that the welfare gains from alleviating this misallocation are substantially larger than those from removing the actual distortion caused by the quota itself. The broader implication is that in countries with weak institutions, the harmful distortion may not be trade costs that are the standard friction of interest in trade models but rather the additional distortions that trade costs engender. Customs facilitation, license allocation, and tariffs and nontariff barriers may all favor politically connected firms. Thus, consistent with Premier Zhu’s belief, liberalization in this setting generated magnified gains because it simultaneously removed deadweight losses and resource misallocation.

However, two recent papers that have examined SOE responses to trade reforms across multiple sectors support the opposite view. Brandt et al. (2017) examine how China’s WTO entry affected the average performance of Chinese firms. They find that trade liberalization increases exit and raises productivity among private-sector firms but that these effects are muted for SOEs. They suggest that the margin of adjustment comes through CEO turnover, with private-sector firms experiencing more changes in management relative to SOEs in sectors more exposed to trade reforms. Baccini et al. (2019) analyze Vietnam’s entry into the WTO in 2007 and essentially find the same differential response as Brandt et al. (2017) did in China. They conclude that aggregate productivity gains from Vietnam’s WTO entry would have been substantially higher without the presence of SOEs. Both papers appeal to preferential access to capital and soft-budget constraints to explain why the impacts of trade reforms are muted for SOEs.

How these results generalize to other countries remains an open question. Naidu et al. (2017) show that networks of elites in Haiti held exclusive import licenses that generated substantial rents. These elites supported the 1991 military coup to overthrow the democratically elected Aristide government, which threatened these rents. Mobarak & Purbasari (2006) show that Indonesian firms connected to the Suharto family were three times more likely to receive import licenses. These two papers suggest important distortions to the types of firms that are able to participate in international trade. Much more research is needed on the subject of how political connections that do not operate through state ownership but through other routes, such as business groups (see the next section), distort the gains from trade reforms in the developing world.

4.3. Business Groups and Family Firms

Business groups and family firms are another important feature of the industrial landscape in developing countries. These groups or conglomerates are often (but not always) family run and

family owned and hold a portfolio of horizontally and vertically integrated businesses. Khanna & Yafeh (2007) argue that business groups can be an optimal organizational structure for firms in countries with imperfect capital markets because they can rely on internal capital markets for finance. They may also serve to mitigate contracting issues between suppliers (see Section 2). At the same time, business groups have weak governance structures, for example, expropriating minority shareholders through tunneling (Bertrand et al. 2002). We are not aware of any evidence on how trade interacts with conglomerate organizational structures.

Family firms present a related but distinct challenge in a trade setting. Caliendo & Rossi-Hansberg (2012) theorize that trade liberalization causes productive firms to expand, leading them to increase the number of layers of management.² However, family firms in developing countries typically rely only on family members at upper levels of management, severely restricting the scope to add layers of management. For example, Ilias (2006) reveals a strong relationship between firm size and the number of brothers of the firm's founder using tailored surveys conducted in Pakistan's surgical goods sector. Bloom & Van Reenen (2007) argue that this (potential) distortion in the allocation of management talent arises because of weak rule of law: Without the ability to punish outsiders who steal from the firm, owners must delegate management decisions to family who can be trusted (or sanctioned).

In summary, despite the emergent literature that studies organizations and international trade, we are not aware of any research that explores how the pervasiveness of conglomerates and family ownership structures in developing countries alters the impacts of trade reforms.

4.4. Externalities and Spillovers

A large body of research explores the possibility that certain firms or sectors generate externalities that are not internalized by the firm. For example, boosting highly capable domestic firms or subsidizing the manufacture of products in targeted sectors may generate externalities that benefit other firms and sectors. While typically not the first-best policy lever, many developing countries attempt to enlarge the size of firms or sectors with positive externalities through trade (and FDI) policy. While industrial policy is an important topic, a review of the literature in this area is beyond the scope of this article; interested readers should consult the extremely comprehensive survey by Harrison & Rodriguez-Clare (2010) and recent research by Bartelme et al. (2019).

5. CONCLUSION

Developing countries are characterized by weak institutions, market failures, and distortions. While recent decades have seen substantial progress in our understanding of how these frictions interact with international trade, significant and policy-relevant gaps remain. We believe that this intersection of trade and development is a ripe area for future work.

To date, much of the research in trade and development has relied on administrative data sets. While these data are valuable for understanding general patterns across a range of sectors, they have two limitations of particular relevance for developing countries. First, much economic activity remains in the informal sector that is not easily captured through administrative data. Second, data on the type and size of the economic distortions that we argue are key to understanding the impacts of trade in developing countries—such as enforcement of regulations, contract structures,

²However, Guadalupe & Wulf (2010) find (empirically) that trade flattens hierarchies (as a result of increased competition in their context).

credit constraints, or political connections—are either unavailable or challenging to extract from administrative data sets.

We see two particularly fruitful avenues for progress. The first is to combine multiple sources and types of data—including leveraging advances in digitization as well as tracking technologies and text analysis—to provide a more complete understanding of the effects of trade in the developing world. The second and complementary approach is to focus on specific industries in which tailored firm surveys and niche data sets can overcome these important measurement concerns. But, as this review argues, crucial to either approach are data that capture the institutional complexities, market failures, and distortions of the particular setting.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

Fatima Aqeel, Emily Gallagher, Paul-Robert Laliberte, and Hesham Nawaz provided excellent research assistance. Pinelopi K. Goldberg and Nina Pavcnik provided very helpful comments. A.K.K. acknowledges support from the Council on Foreign Relations International Affairs Fellowship in International Economics, and thanks the World Bank for their hospitality.

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