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DISCUSSION PAPER

Labor Compliance Programs in Developing Countries and Trade Flows:

Evidence from Better Work

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Abstract: Exporting apparel supports economic development by creating formal-sector employment opportunities for workers (especially women) whose best alternative domestic employment opportunities are informal work or agriculture. At the same time, apparel production is highly scrutinized due to concerns about poor working conditions. The question of whether programs to improve working conditions are associated with more or less apparel exports remains a central concern to both current and potential apparel-exporting developing-country governments. To evaluate this question, this study estimates the difference in exports following country-level initiation of the ILO-IFC's Better Work program that currently operates in 10 apparel-exporting developing countries and has a well-established positive effect on working conditions in participating apparel-exporting factories. Using a Poisson pseudo-maximum likelihood gravity model approach, this study compares apparel exports after entering the Better Work program against apparel exports from all other countries while controlling for importer, exporter, time, and country-pair fixed effects. The results show that apparel exports are significantly higher following the initiation of the Better Work program relative to apparel-exporting countries that did not enter Better Work.

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Introduction

Since the early 1990s, apparel production has shifted from higher-income and middle-income countries to low-wage countries. Apparel exports contribute to economic development and offer formal-sector labor-market opportunities for women and workers in agriculture and the informal sector (Lopez-Acevedo and Robertson 2012, 2016, Frederick et al. 2022). Though value-chain-related exports lead to an increase in labor demand in developing countries (Robertson et al. 2009), they also lead to greater global scrutiny regarding working conditions in exporting factories. Media reports of disasters, lack of compliance with labor law and international labor standards, and human rights violations (including forced labor and rape) motivate attempts to improve conditions in exporting factories (Elliott and Freeman 2003; Jammulamadaka 2013; Sinkovics et al. 2016). Concerns about working conditions in apparel-exporting factories contribute to a debate about the relationship between programs to improve labor compliance and apparel exports.

Shifting apparel production to low-wage countries generated tensions between major stakeholders (e.g. Fung et al. 2001, Powell and Skarbek 2006, Gereffi and Loo 2012, Powell 2014). Buyers, suppliers, governments, and workers debate the causes and consequences of poor conditions. Economists often see low wages in developing countries as a symptom of low per-capita gross domestic product, which, in turn, is a function of institutions, capital, and technology (Solow 1988, Acemoglu et al. 2005). Low-income countries generally have less-developed institutions to protect workers (such as occupational safety, health regulations and enforcement). As a result, workers in these countries often experience long working hours, high temperatures, insufficient access to sanitation and water, unpaid benefits and other similar concerns. In some cases, poor conditions lead to death. Although better paid than domestic alternatives (Robertson et al. 2009), interviews and surveys show that families hope for better than apparel jobs for their children (Dominguez et al, 2010 and Record et al., 2012, 2014). Families express a preference for less strenuous and better-paid opportunities than those found in the assembly-for-export sector (Fontana & Silberman 2013). Programs to improve conditions, while beneficial, can be costly and, if costs increase, exports may fall.

To contribute to the debate on this question, this study compares the change in apparel exports after countries enter the Better Work program compared to the change apparel exports from other exporters that do not participate in Better Work in similar years. The Better Work program is the result of a collaboration between the International Labour Organization and the International Finance Corporation of the World Bank. The program started in Cambodia as the result of a trade agreement between the United States and Cambodia (Robertson 2022) and, in 2022, operated in ten countries with additional participation in two others.

To estimate the change in apparel exports after a country enters Better Work relative to the change in apparel exports from non-Better Work countries over the same time period, this study applies recent advances in estimating a gravity model, which is the standard workhorse of empirical international trade policy evaluation. Using annual import data from all available country-pairs over the 1990-2019 period, this study uses a high-dimension fixed effects Poisson pseudo maximum likelihood approach that includes country pair, year, exporter, and importer

fixed effects. The results show that apparel exports are higher after countries enter Better Work relative to the change experienced by rest of the world's apparel exporters. The results vary across participating countries and are robust to controlling for China's entrance into the World Trade Organization (WTO), regional trade agreements (RTAs), and Better Work's coverage of the apparel exporting sector within each country.

Labor Compliance Programs and International Trade

The underlying question motivating this study is whether apparel exports are higher after a country joins or implements programs to improve labor compliance (and, by extension, working conditions). Programs may affect trade in at least two ways. First, programs that engage with the broadly-defined apparel sector and related stakeholders may increase the confidence of international buyers that conditions are either better or are likely to improve more than in comparable sourcing countries, making the country with a program more attractive as a sourcing destination. By engaging and facilitating cooperation with governments, unions, and business leaders, Better Work qualifies as one such program.

Second, if effective, labor compliance programs increase labor compliance. The theoretic relationship between labor compliance and international trade is ambiguous, leading to a spirited policy debate. On one hand, some argue that attempts to improve working conditions in developing countries are, in fact, "hidden protectionism" and that improvements in labor working conditions and compliance would reduce trade. In particular, some developing countries argue that attempts to motivate governments to increase domestic enforcement of national labor law and international labor standards are attempts to raise production costs that reduce exports in order to reduce competition with producers in the importing country. Similarly, some in developed countries argue that improvements in labor compliance were necessary to "level the playing field" with countries whose low labor costs are, at least in part, attributed to a lack of compliance with national labor law and international standards. In both cases, improved labor compliance would be expected to reduce trade, either because compliance drives up production costs or because compliance drives out producers who do not adhere to national labor law or international labor standards.

On the other hand, poor working conditions and a lack of labor compliance could be a "non-tariff barrier" to trade by making potential exporting countries less attractive to reputation-sensitive buyers or inhibiting factory performance. As Polaski (2004) argues, providing evidence of compliance is attractive to reputation-sensitive buyers. The range of factors affecting buyer preferences and factory compliance is also broad, leading to heterogeneous outcomes (Toffel et al. 2015, Amengual et al. 2020, Short et al. 2020). Factories and producers in developing countries that can demonstrate improved compliance might elicit additional orders from reputation-sensitive buyers (Oka 2014, Locke and Distelhorst 2018). In addition, there are several economic theories that suggest that compliance is associated with higher productivity and improved factory performance. Exporting is positively associated with factory size and the liklihood of being audited for labor conditions (Tanaka 2020). Robertson et al. (2020) offer some evidence that improved compliance is more closely associated with factory survival in Cambodia. Amengual et al. (2020) show that buyers terminated relationships with factories with poor performance,

suggesting that factories with poor labor compliance are at risk of losing business and possibly closing. Having Better Work operating in a country might be a signal to lead firms and consumers that conditions in that country are better, leading to increased exports. Note that the effects of Better Work might be most appropriately estimated at the country level, as in this study, since consumers only see a country name on clothing labels and not necessarily an indication of whether or not a garment was produced in a particular factory.

Studying the change in national exports after entering Better Work contributes to the debate about the relationship between improvements in compliance and working conditions if Better Work is associated with improved compliance and working conditions. The academic literature clearly shows that Better Work is associated with improved compliance and working conditions. The Better Work program grew out of a 1999 trade agreement between the United States and Cambodia linked access to the United States apparel market to improvements in working conditions in Cambodian garment factories. To assess Cambodian working conditions, the International Labour Organisation (ILO) of the United Nations and the International Finance Corporation (IFC) of the World Bank developed the Better Factories Cambodia (BFC) program. The BFC program has been tied to significant improvements in working conditions in Cambodia (Beresford 2009, Berik and van der Meulen Rodgers 2010, Brown et al. 2014a, 2014b, 2014c, Kotikula et al. 2015, Robertson 2019b, Shea et al. 2010). The success of the program laid the foundation for a global Better Work program in 2007. Many studies show that labor compliance increases in Better Work factories with time in Better Work and that the remediation programs implemented by Better Work are associated with improvements in factory-level labor compliance (Pike 2020, Brown et al. 2016, and others).

Figure 1 shows the countries that are associated with Better Work: Bangladesh, Cambodia, Egypt, Ethiopia, Haiti, Indonesia, Jordan, Lesotho (which ended in 2016), Madagascar, Nicaragua, Pakistan, and Vietnam. Madagascar has a relationship with Better Work but did not have fully-launched programs as of 2022 and is not included in the sample. Better Work began in 2019 in Ethiopia and in 2021 in Pakistan. To avoid the Covid-19 pandemic years of 2020 and 2021, these countries are not included in the empirical analysis. Note that the Lesotho program ended in 2016, but is still included in the sample so that exports during the program can be compared to exports both before and after the program was in effect. Table 1 shows some characteristics of the Better Work countries included in the analysis relative to the rest of the world.

Table 1 shows that the share of the global apparel export market increased in all nine included Better Work countries (although only slightly in Lesotho). The share of apparel trade of non-Better Work countries ("Rest of the World") fell as Better Work countries expanded apparel exports. Apparel-producing countries are often low-wage countries. Table 1 also shows that Better Work countries are different from other countries in the sense that the levels of GDP per capita (which are highly correlated with production-worker wage levels in cross-country comparisons) are much lower than global averages.

Trade drives economic growth (Frankel and Romer 1999). Since 1990, the average GDP per capita (in real terms) of apparel-exporting countries has increased (Figure 2). The increase in average GDP per capita of apparel-exporting countries is largely driven by China, which exports over half of the world's apparel and experienced significantly increasing GDP per capita since 2000. Table

1 shows that the real gross domestic product (GDP) per capita increased in Better Work and non-Better Work countries between 2000 and 2019. The percent change in real GDP is higher for most Better Work countries than the average increase for the rest of the world. The increases are especially high in Bangladesh, Cambodia, and Viet Nam. Egypt, Haiti, Jordan, and Nicaragua had lower-than-average increases in GDP per capita.

Since 2011, China's share of the global apparel market has been falling as wages and concerns about labor practices rise in China and Buyers shift to other countries. Finding ways to capture apparel exports leaving China has been on the minds of policymakers in developing countries (Lopez Acevedo and Robertson 2012, 2016) as they consider initiatives to increase their attractiveness to global apparel markets. Labor Compliance Programs (LCP), such as Better Work, are one way that countries can reduce concerns that Buyers have about sourcing from a country, suggesting that joining a LCP might be associated with increased exports.

Empirical Approach

To estimate the change in exports after entering Better Work, the paper applies the gravity model. Economists often employ the gravity model to estimate the relationship between bilateral trade flows and variables that affect trade, such as trade policy (e.g. Head and Meyer 2015, Chaney 2018). The core elements of the gravity model are each country's gross domestic product (GDP), the distance between the countries, and trade costs (Tinbergen 1962). To illustrate the familiar foundation of the modern empirical gravity model, we follow Anderson and van Wincoop (2003) who model exports from region i to region j (x_{ij}) as a function of gross domestic production in regions i and j (y_i and y_j), world nominal income (y^w), the cost in j of importing a good from i (t_{ij}), a substitution elasticity σ between all goods from different countries, and aggregate price levels (consumer price indices) for each country P_i and P_j:

$$x_{ij} = \frac{y_i y_j}{y^w}\left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma} \quad (1)$$

The aggregate price terms capture "multilateral resistance" measures that are important to incorporate into gravity model estimations. As noted by Bachetta et al. (2012), the multilateral resistance terms are often represented with country fixed effects. Trade costs include distance (which is usually modeled as the geographic distance between countries), information costs (including a wide range of variables, such as language and colonial lineage (Egger and Lassman 2012, Fidrmuc and Fidrmuc 2015)), literacy rates and linguistic diversity (Melitz 2008), population and population dispersion (Chung and Wall 2005), common currencies (Head et al. 2010)), trade policies and trade agreements, and policies that might affect demand or production costs, such as labor compliance.

Estimation Issues

Although estimating versions of the log-linearized form of (1) by ordinary least squares (OLS) remains common, Head and Meyer (2014) and Yotov et al. (2016) highlight concerns about the occurrence of zero trade flows and the heteroskedasticity often found in trade data. The logarithm of zero is not defined and undefined observations are excluded from regressions. Furthermore, the estimates of the effects of trade costs and trade policy are not only biased but

also inconsistent when the gravity model is estimated in log-linear form with the OLS estimator or other estimators that require a non-linear transformation.[1] Multilateral resistance is often addressed with country-specific fixed effects. The endogeneity of trade agreements (Bair and Bergstrand 2007) is often addressed with country-pair fixed effects. Following the seminal article by Santos Silva and Tenreyro (2006), the literature considers the Poisson Pseudo Maximum Likelihood (PPML) estimator a very attractive alternative to OLS for empirical gravity analysis (See Yotov et al. 2016). Subsequent papers build upon the PPML approach proposed by Santos Silva and Tenreyro (2006) and establish its appropriateness for gravity model estimation (Burger, Van Oort, and Linders 2009, Silva and Tenreyro 2011, Martínez-Zarzoso 2013). We follow this literature and use the PPML method with high dimensional fixed effects (HDFE) as our main estimation using Stata's *ppmlhdfe* command (Correia et al. 2019a, 2019b). The high-dimensional fixed effects approach includes a wide range of fixed effects, including importer, exporter, year, and country pair fixed effects as in De Benedictis and Taglioni (2011) and subsequent papers.

Construction of the dataset

To estimate the change in apparel trade after countries enter Better Work, we combine data from COMTRADE and CEPII, which are standard sources for gravity data (Conte et al. 2022). The COMTRADE data provide country-pair imports of apparel (Harmonized System (HS) categories 61 and 62) for each year from 1990-2019. The CEPII gravity database contains imports (summed across all HS codes) for each country pair. We limit the data to 1990-2019. These data are used to construct the apparel shares in Table 1 and the weighted GDP per capita of apparel exporters in Figure 2. To focus specifically on U.S. imports, we employ a third dataset that comes from the U.S. Commerce Department's Office of Textiles and Apparel (OTEXA). OTEXA collects detailed information about U.S. apparel and textile imports by month that can be separated into values and quantities. The CEPII database includes 248 importers and 248 exporters and the OTEXA data cover 200 exporters. The OTEXA data begin in 1989 and the data used in this paper end in 2019.

Empirical Estimates

The main identification strategy is to compare the change in trade between country pairs that have at least one trade partner that enters and actively participates in the Better Work program against the change in trade between non-Better Work countries at the same points in time. In that sense, our identification strategy is similar to a "difference-in-difference" approach in which we compare apparel trade between Better Work countries and other countries before the countries enter Better Work (the "first difference") against the differences in apparel trade between countries actively in Better Work and those not in Better Work over the same time period. The main dependent variable is one-way pair-wise apparel trade[2], but we also use one-

[1] Chung and Wall (2005) find that unless heteroskedasticity is accounted for correctly, gravity models will typically overestimate the relationship between integration and trade.

[2] Each country appears in the data as an importer and an exporter, leading to two observations for each country pair.

way pair-wise total trade for comparison. Unless otherwise specified, we follow the convention of the gravity literature and express both total trade and apparel trade in nominal U.S. dollars.

Baseline Results

The baseline gravity model results are shown in Table 2. Table 2 does not have any fixed effects but is presented to illustrate the role of some of the "usual" gravity model parameters. In the first two columns of Table 2, we use Ordinary Least Squares (OLS) to estimate the relationship between Better Work and total trade (column 1) and apparel trade (column 2). Note that the first two rows are labeled "Entering Better Work" and "Better Work Country." The first row, "Entering Better Work" captures the change in exports when a country enters the Better Work program. The second row, "Better Work Country" is constant over time and captures the potential characteristics of Better Work countries that are constant over time but may be different than other countries. This variable is important to include to control for possible selection bias into Better Work. If countries that eventually enter Better Work are different than other countries in ways that are constant over time, then the "Better Work Country" variable captures those differences.

The OLS estimates suggest that entering Better Work is associated with higher apparel trade (column 2), but less total trade (column 1). The fall in total trade may seem curious, but this result changes once we include the full set of fixed effects and therefore defer the discussion of the coefficient estimate to the discussion of the PPML results below. The main point of including the total trade comparison is to show that the apparel results are not simply an artifact of the gravity model specification, the sample selection, using nominal variables, unobserved country effects, or changes over time. The second row shows that Better Work countries generally export more apparel than countries that do not enter Better Work, but do not necessarily export more overall. As expected with the gravity model, distance and GDP (of both the importer and exporter) have significant effects on trade flows. Distance deters both total trade and apparel trade, and higher GDP of both the importer and the exporter is associated with more trade.

The PPML estimates for total trade and apparel trade are shown in columns (3) and (4). Note that in this case, entering Better Work is associated with more overall trade and more apparel trade, but neither estimate is statistically significant. The PPML estimates in the second row show that Better Work countries are associated with higher overall apparel exports. The other gravity variables have the usual signs.

Controlling for Unobserved Characteristics

One obvious concern about the results in Table 2 is that there are many other factors that affect trade that are not explicitly included in the estimation. To address this, Table 3 presents HDFE PPML estimates that include a fixed effect for each exporter, each importer, each country pair, and each year. These fixed effects control for unobserved factors that are specific to each exporter, importer, pair, and year that are not otherwise captured in the estimation. Note that adding these fixed effects generalize the "Better Work Country" variable found in Table 2 by allowing each country to have a unique fixed effect – both as an importer and again as an exporter. These variables control for unobserved characteristics like differences in energy costs, government type and capacity, production efficiency, and other variables that are constant over time but differ across countries. The pair-wise fixed effects control for everything specific to a

country-pair relationship that is constant over time, such as having a colonial relationship, common language, similar preferences, and so on. In addition, the estimation in Table 3 also includes fixed effects for each year in the sample to control for unobserved conditions that vary by year but might affect all countries (such as the global financial crisis in 2007-2008).

Note that in Table 3, the variable "Better Work Country" no longer appears because each country has its own fixed effect. Therefore, the "Better Work" variable now captures the change in trade after a country enters Better Work relative to the change in apparel trade in all other countries when unobservable factors are controlled for with the other fixed effects. Table 3 shows that, once the fixed effects are included, participating in Better Work is associated with more total trade and more apparel trade. Note that the estimated difference in total trade after entering Better Work is about 38%. That is, controlling for a wide range of unobserved characteristics, the *conditional* change in total exports relative to the change in apparel exports from non-Better Work countries is significant. The estimate for apparel exports is 82.6%, which suggests that if non-Better Work countries increase apparel exports by 10%, Better Work countries would experience an increase in apparel exports of 18.3%, and this difference is statistically significant.

To provide a point of comparison for the magnitude of the estimates, column (3) includes China's entrance into the WTO in 2001. After entering the WTO, China's apparel exports to the world increased dramatically and adversely affected apparel workers in other apparel-exporting countries (Robertson et al. 2020). The results in column (3) of Table 3 suggest that the change in trade following entering Better Work is larger in percent terms (not in absolute changes) than the change in apparel trade that China experienced following entering the WTO. China's estimated conditional increase in apparel trade was about 73.8%. In contrast, the estimated difference in apparel exports for Better Work countries is nearly 91.2% higher than the increase experienced by non-Better Work countries other than China. Note that the Better Work estimate increases when we control for China's entrance to the WTO because China was the largest apparel-exporting country in the world and, when included explicitly in the estimation, the relative comparison group for Better Work countries becomes all other countries besides China.

Better Work is strongly supported by the European Union, the United States, and Japan, which happen to be the world's largest apparel consumption and imports. One way to isolate the effects of Better Work is to compare the results for all countries with just these main apparel importers, as shown in column (4) of Table 3. The estimates suggest that the difference in exports to the EU, USA, and Canada is slightly smaller than the change in exports to the world (from column 2), which suggest that the EU, USA, and Japan are not uniquely driving the results.

Focusing on U.S. Apparel Imports

The data used in Tables 2 and 3 come from CEPII and Comtrade. To focus on U.S. apparel imports specifically, we turn to the Office of Textiles and Apparel of the U.S. Department of Commerce (OTEXA). OTEXA specifically collects data on U.S. apparel imports. The U.S. apparel data can be decomposed into quantities, total values, and unit values ("prices"). Table 4 shows the gravity results using the OTEXA data. The results in column (1) are consistent with those in the earlier tables in the sense that Better Work countries generally export much more apparel after joining Better Work when compared to other apparel-exporting countries serving the U.S. market.

The increase in value shown in Column 1 is decomposed into quantity (column 2) and unit values (column 3). Column 2 shows that the increase in value is explained by the increase in physical quantity, while Column 3 focuses on unit values. Column 3 shows that entering Better Work is associated with falling unit values. This result could indicate a specialization into lower-valued products, an increase in productivity that is reflected in falling prices, or downward pressure on prices for other reasons. Discerning between these three possibilities is left for future research.

The OTEXA data are unusually rich, including U.S. imports at the 10-digit Harmonized System level. This level of disaggregation is sometimes likened to the product level (but not the brand or barcode level, which is even more disaggregated and rarely publicly available). When using 10-digit HS import values, as shown in column (4) or Table 4, the results are very similar to those shown in column (1) of Table 4. The results suggest that the increase in apparel exports after countries enter Better Work is 83.7% higher than the increase experienced by non-Better Work countries.

Individual Better Work Countries

The Better Work countries each have their own stories, and so it is possible that the Better Work experience varies across countries. Table 5 contains the estimates of the difference in apparel exports for each country after entering Better Work. The results reveal significant heterogeneity across countries. For example, Lesotho's apparel exports after joining Better Work were slightly lower (conditional on controlling for the unobserved factors with fixed effects), and the difference between before and after Better Work is not statistically significant. The Lesotho program ended in 2016. Bangladesh, Cambodia, Haiti, Jordan, Nicaragua, and Vietnam are all associated with more apparel exports after joining Better Work relative to other apparel-exporting countries. Egypt and Indonesia experienced relatively modest increases. Column (3) again compares the individual country estimates with China's experience and shows that some countries have even larger increases in apparel trade, in percentage terms, than China experienced after joining the WTO and, when controlling for China's WTO experience, the estimates of the change for most countries increases significantly.

Differences in Better Work Coverage of the Apparel Sector

Readers familiar with the Better Work program will recall that Better Work does not cover all apparel factories in all countries. In fact, Better Work coverage of the apparel sector varies significantly across countries. Figure 3, for example, uses the latest data available to illustrate some of the differences across Better Work countries.

If Better Work coverage varies across countries, one might wonder if adjusting for the coverage of the apparel sector would affect the estimates of the difference in trade following entering Better Work. To assess this question, we replace the Better Work variable with the share of the sector covered by Better Work using the data in Figure 3 and then estimate the same estimation used in Table 3. Table 6 contains the revised results.

Comparing Table 3 and Table 6 suggests that accounting for the extent of Better Work coverage of the apparel sector generates much larger estimates for the difference in apparel exports. In fact, the results nearly triple in magnitude. Table 6, for example, suggests that the (conditional) difference in apparel exports after a country joins Better Work is now close to 227.3%. As in

earlier tables, controlling for China generates somewhat larger estimates. The apparel estimate in column (3) suggests that the change in apparel exports after a country joins Better Work is about 252.0% higher – more than double – than the increase experienced by non-Better Work apparel producers. Of course, one reason this estimate is so large is that the countries with smaller Better Work coverage are the larger countries that would have a smaller percentage increase in exports over time for a given absolute change in exports and smaller countries that are easier to cover would have a larger percentage increase. Nevertheless, the main point is that controlling for differences in sector coverage is associated with larger differences in apparel trade after countries enter Better Work. While one might wonder if increasing coverage over time within countries affects exports, annual data of Better Work coverage for all countries and all years are not available.

Regional Trade Agreements

Regional trade agreements, including free trade agreements and bilateral agreements, significantly affect trade flows (Baier and Bergstrand 2007). Trade agreements have heterogeneous effects on trade, but generally increase total trade (Baier et al. 2018). With respect to apparel, however, trade agreements are not necessarily trade promoting. Trade agreements often have specific clauses related to apparel that may either increase or reduce apparel trade. As a result, controlling for regional trade agreements might affect our estimates of the difference in trade after countries enter Better Work.

To illustrate these differences, Table 7 shows that Better Work is still associated with more total trade, and regional trade agreements are associated with about 27.9% more total trade after countries enter a trade agreement. This estimate is similar to other estimates from PPML estimation and is consistent with the idea that regional trade agreements are associated with more trade.

For apparel trade, however, the results in column (2) of Table 7 suggest that regional trade agreements are not associated with more apparel trade on average. In fact, the negative estimate shown in column (2), although not statistically significant, suggests that trade agreements are associated with a smaller increase in apparel trade (although more total trade) than countries without trade agreements experience. When controlling for China's WTO entrance, the RTA estimate becomes more negative and still statistically insignificant. Note that the standard error (in parentheses) is higher than for other estimates. The larger standard error suggests that trade agreements have a very heterogeneous treatment of apparel: some agreements may increase apparel trade, but others may restrict it. Developing countries seeking to increase apparel exports might be wary of trade agreements and look for alternative ways to increase apparel exports.

In terms of Better Work, including a control for regional trade agreements in apparel trade, such as in column (2) of Table 7, suggests that the Better Work estimate of the difference in trade is not qualitatively affected. That is, the Better Work estimates are very similar to those in Table 3, suggesting that controlling for regional trade agreements does not affect our estimates of the change in apparel trade when countries enter Better Work. Better Work is still associated with an 82-91% higher increase in trade than the change experienced by non-Better Work countries.

Trade agreements generally have two kinds of provisions: tariffs and non-tariff provisions. The expansion of "deep" trade agreements has raised questions about whether the non-tariff provisions work to facilitate or inhibit trade (Rodrik 2018). Therefore, it might be important to control for tariff provisions separately. In Table 8 we extend the analysis in Table 7 by adding tariff preference margins. Tariff preference margins are the difference between the tariff level set by the agreement and that tariff level in place without the agreement (the "most favored nation" tariff). Larger values of the tariff preference margin suggest that the agreement generated deeper tariff cuts. If tariff cuts encourage trade, then we would expect a positive relationship between the tariff preference margin and trade flows. When included in the estimation, the RTA estimate should reflect the contribution of non-tariff provisions to total trade.

Table 8 shows that, for total trade, larger tariff preference margins are associated with more trade. When tariff preference margins are added to the estimation, the RTA estimate becomes negative and statistically insignificant. The estimate for Better Work, however, is not qualitatively affected in the sense that joining Better Work is still associated with about 48% larger increase in trade than other counties experience without Better Work. For apparel, as shown in column (2) of Table 8, the effects are starker. The RTA variable becomes negative and statistically significant at the 10% level, and the tariff preference margin is small but not significant. This result reflects the fact that in most agreements the separate provisions related to apparel are non-tariff provisions and that tariff reductions are not playing a significant role in the treatment apparel receives in trade agreements. In terms of Better Work, however, the same results emerge: apparel exports in Better Work countries increase about 81% more than in apparel-exporting countries not in Better Work.

Product Diversity

Estimating the difference in the change in trade between Better Work countries and non-Better Work countries while including year, country, and country-pair fixed effects shows that apparel exports increased more in Better Work countries than in others, both in terms of quantity and value (Table 4). Another measure of export success is expanding the diversity of products exported. Figure 4 shows the "new product" share of total apparel exports after countries enter Better Work. Specifically, Figure 4 shows the share of total exports that consist of new apparel products (defined as HS10 apparel categories as discussed earlier) that were not exported prior to entering Better Work. Figure 4 shows a range of new product shares, ranging from nearly 40% for Bangladesh to close to zero for Lesotho (that ended its Better Work program) and less than 5% for Egypt. Other than Lesotho, each country expanded the range of products produced by adding new products to its export portfolio.

Another way to measure export diversity of exported products is with the Herfindahl-Hirschman Index (HH Index), which sums the squares of the export share of each product. Higher numbers indicate more concentration (less diversity). Expanding the range of exported products would reduce the concentration index. Table 9 shows the PPML HDFE estimates of the change in both the HH Index (column 1) and the total number of HS10 apparel categories with positive exports. The results show that product diversity of Better Work countries increases more than product diversity increases in non-Better Work countries. In column (1), the negative (and statistically

significant) result shows that entering Better Work is associated with a falling HH Index (i.e. falling concentration of exports). Column (2) shows that entering Better Work is associated with a relatively large (nearly 200) increase in the number of HS10 apparel categories with positive exports. Although capturing slighting different aspects of export diversity, both results show that product diversity increases more for Better Work countries after they enter Better Work than non-Better Work countries.

Conclusions

The empirical academic economics clearly establishes a positive link between trade and economic growth. Apparel exports are often the first export industry developing countries enter due to the low start-up costs and relatively low levels of human capital required and pull workers into the formal sector from informality and agriculture (Robertson et al. 2009, Lopez Acevedo and Robertson 2012, 2016, Frederick et al. 2022). Using the case of Better Work, this paper employs a gravity approach to generate estimates of the change in exports apparel-producing countries experience after entering Better Work relative to other apparel-producing countries. On the aggregate level, this paper shows that countries that enter the Better Work program experience, on average, a large and significant increase in apparel exports. Although the estimates vary somewhat by specification, a lower bound on our estimates is about 80%: apparel exports from Better Work countries increase about 80% more than the increase experienced by non-Better Work countries. In other words, for every hundred-dollar increase in apparel exports of non-Better Work countries, Better Work countries experienced an increase of at least $180. The increase is robust to including a very large number of controls for unobserved characteristics and approaches that are often applied to address the potential endogeneity of trade policies. The results also suggest that the range of apparel products exported (i.e. product diversification) also increases after entering Better Work more than the increase observed in non-Better Work countries. The results vary across countries, suggesting that understanding individual country experiences would be a productive area for future research.

By focusing on aggregate (national) apparel exports, this paper does not reveal much about firm-level experiences. But to the extent that exports increase at the national level, either firms that improve export more or firms that do not improve export more. Further firm-level research would be useful to identify what happens within countries that join Better Work, but, at the aggregate level, apparel exports of countries that join Better Work increase more than non-Better Work countries.

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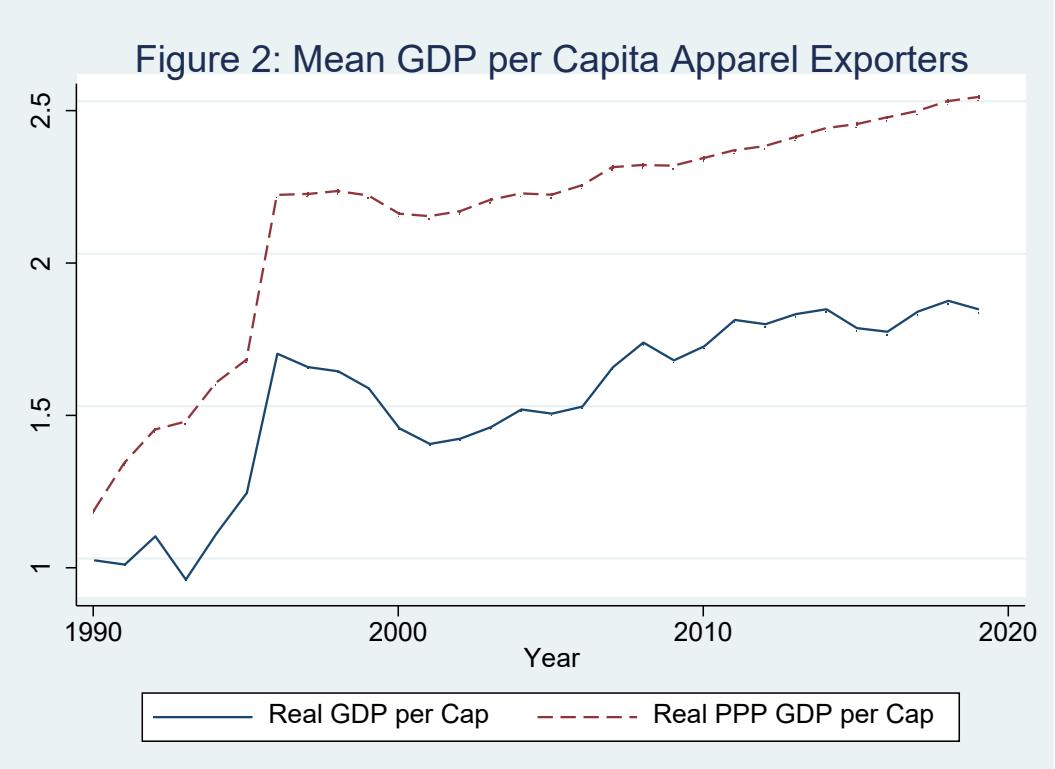
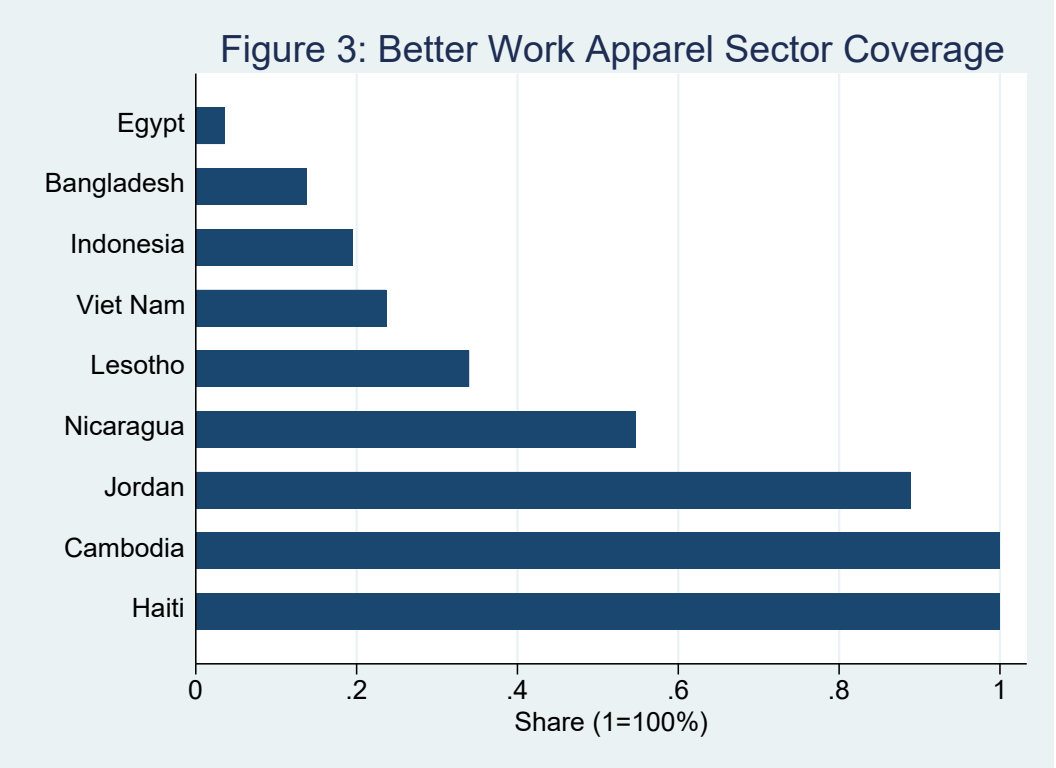
Figure 1: Better Work Affiliated Countries

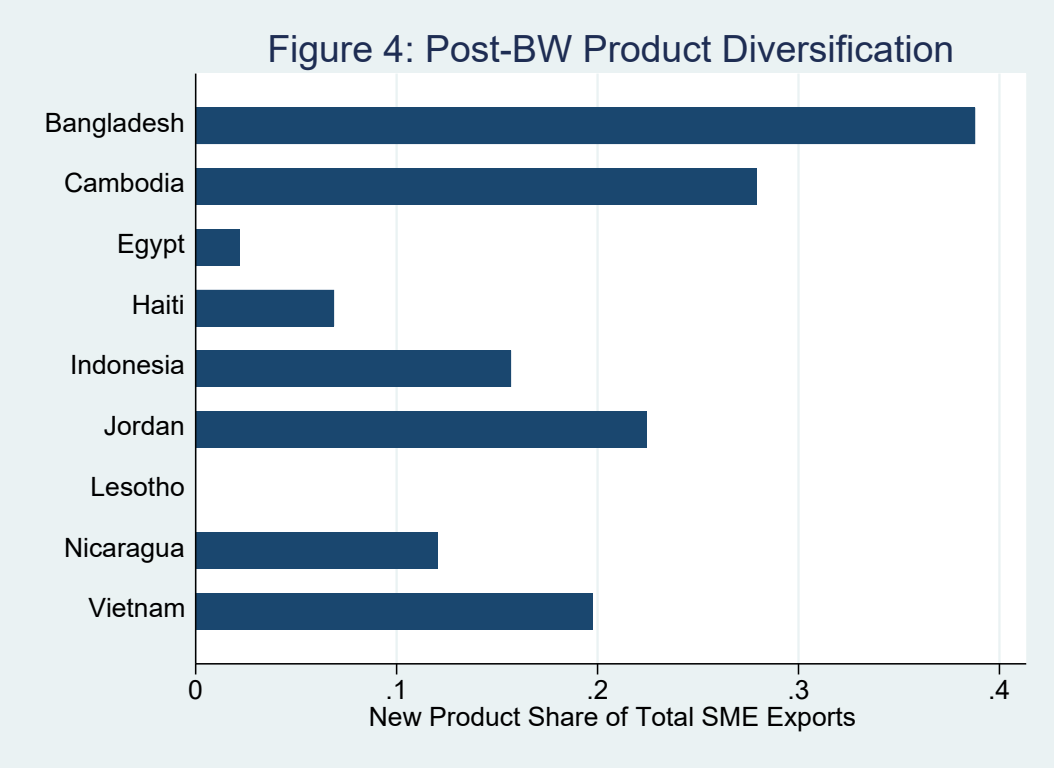
Notes: Better Work countries covered in the study include Bangladesh, Cambodia, Egypt, Haiti, Indonesia, Jordan, Lesotho (which ended in 2016), Nicaragua, and Viet Nam. Madagascar has a relationship with Better Work but did not have fully-launched program as of 2022 and is not included in the sample. Better Work began in 2019 in Ethiopia and in 2021 in Pakistan; these countries are not included in the empirical analysis because the time since start was characterized by the COVID-19 crisis and therefore may not be typical.



Notes: Author's elaboration using data from BACI and Comtrade. Each series is constructed as the weighted mean of the log of real GDP per capita (constant (2010) US$) using each country's share of total (global) apparel exports as weights. PPP stands for purchasing power parity as explained in the CEPII database. Note that this figure constructs the weighted mean for all apparel exporters, not just Better Work countries.



Notes: Data are from the latest year available as provided by Better Work Global, with the exception of Lesotho, which come from Pike and Godfrey (2012).



Notes: This figure illustrates the percent of total U.S. imports from each country (measured in square-meter equivalent (SME), which is a quantity measure) that come from 10-digit Harmonized System (HS) products that the United States did not import from that country prior to the country entering Better Work.

Table 1: Summary Statistics of Better Work Countries

Country	Global Apparel Share		Real GDP per Capita		
	1999	2019	2000	2019	% Change
Rest of World	93.70%	74.90%	11.14	16.97	42.11%
Bangladesh (2014)	2.10%	9.70%	2.29	5.55	88.34%
Cambodia (2001)	0.50%	3.10%	1.48	4.39	108.59%
Egypt (2017)	0.40%	0.50%	7.74	11.76	41.80%
Haiti (2009)	0.10%	0.30%	2.94	3.07	4.31%
Indonesia (2011)	2.20%	2.40%	5.69	11.81	73.05%
Jordan (2009)	0.00%	0.50%	8.74	10.07	14.16%
Lesotho (2011)	0.00%	0.10%	1.69	2.66	45.49%
Nicaragua (2012)	0.20%	0.50%	3.97	5.45	31.64%
Viet Nam (2009)	0.70%	8.00%	3.65	10.13	102.14%

Notes: Author's elaboration using data from Comtrade and World Bank Development Indicators. The year the Better Work program started in is parentheses next to the country name. Real GDP per capita is in thousands of constant 2017 purchasing-power parity adjusted (PPP) international $) from the World Bank development indicators. The apparel share is each country's share of total (global) apparel exports for the year indicated.

Table 2: Baseline Gravity

VARIABLES	(1) OLS Total Trade	(2) OLS Apparel	(3) PPML Total Trade	(4) PPML Apparel
Entering Better Work	-0.226***	0.484***	0.179	0.197
	(0.0610)	(0.0973)	(0.122)	(0.175)
Better Work Country	0.0116	1.865***	-0.00294	1.642***
	(0.0602)	(0.0961)	(0.129)	(0.204)
Distance	-1.335***	-1.308***	-0.751***	-0.535***
	(0.0140)	(0.0216)	(0.0300)	(0.0885)
GDP Exporter	1.157***	0.794***	0.806***	0.690***
	(0.00582)	(0.00918)	(0.0188)	(0.0607)
GDP Importer	0.867***	0.820***	0.782***	0.921***
	(0.00585)	(0.00984)	(0.0239)	(0.0674)
Constant	-15.82***	-7.347***	-11.27***	-10.40***
	(0.218)	(0.308)	(0.750)	(2.491)
Observations	267,822	267,822	267,822	267,822
R-squared	0.698	0.397	0.619	0.143
Fixed Effects	No	No	No	No

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. OLS stands for Ordinary Least Squares. PPML stands for Poisson Pseudo Maximum Likelihood. Sample is restricted to just observations with apparel trade.

Table 3: Fixed Effects PPML Estimates

VARIABLES	(1) Total Trade	(2) Apparel Trade	(3) China WTO Comparison	(4) EU USA Can Japan
Better Work	0.376***	0.826***	0.912***	0.777***
	(0.100)	(0.109)	(0.105)	(0.115)
China WTO			0.738***	
			(0.251)	
Constant	16.29***	20.60***	20.39***	20.89***
	(0.00135)	(0.00923)	(0.0722)	(0.0104)
Observations	663,262	296,383	296,383	77,899
Fixed Effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. PPML stands for Poisson Pseudo Maximum Likelihood estimation as described in the text. Fixed effects include years, countries, and country pairs. Sample for total trade differs from Table 2 in that all country-pair-year observations with non-missing trade values are included. Standard errors are clustered on country pairs.

Table 4: Gravity Estimates for U.S. Apparel Imports

VARIABLES	(1) Value (Real USD)	(2) Quantity (SME)	(3) Price (Unit Value)	(4) 10-Digit HS (SME)
Better Work	0.876***	0.675***	-0.449***	0.837***
	(0.214)	(0.230)	(0.123)	(0.0744)
Exporter GDP	1.231***	1.435***	0.234**	
	(0.204)	(0.228)	(0.110)	
Constant	-2.145	-7.301	-1.400	14.88***
	(3.958)	(4.478)	(1.833)	(0.0117)
Observations	5,036	5,036	4,428	5,016,363
Fixed Effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. U.S. import data are from OTEXA. SME stands for "Square meter equivalent", which is a comparable measure of quantity for apparel imports.

Table 5: Individual BW Countries

VARIABLES	(1) Total Trade	(2) Apparel Trade	(3) China WTO Comparison
Bangladesh	0.575***	0.883***	0.960***
	(0.0927)	(0.121)	(0.118)
Cambodia	1.450***	1.980***	2.217***
	(0.192)	(0.227)	(0.219)
Egypt	0.121*	0.155	0.225*
	(0.0639)	(0.117)	(0.115)
Haiti	0.227***	0.653***	0.778***
	(0.0457)	(0.0801)	(0.0666)
Indonesia	0.0161	0.173	0.245**
	(0.0961)	(0.118)	(0.114)
Jordan	0.147*	0.622***	0.748***
	(0.0782)	(0.0906)	(0.0770)
Lesotho	0.139	-0.170	-0.148
	(0.309)	(0.109)	(0.106)
Nicaragua	0.726***	0.713***	0.815***
	(0.0918)	(0.0690)	(0.0584)
Viet Nam	1.067***	1.284***	1.370***
	(0.116)	(0.122)	(0.117)
ChinaWTO			0.747***
			(0.251)
Constant	16.29***	20.58***	20.36***
	(0.000886)	(0.00736)	(0.0724)
Observations	663,262	296,383	296,383
Fixed Effects	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Better Work Apparel Sector Coverage

	(1)	(2)	(3)
VARIABLES	Total Trade	Apparel Trade	China WTO Comparison
Better Work	1.487***	2.273***	2.520***
(% Country Coverage)	(0.430)	(0.811)	(0.845)
China WTO			0.681***
			(0.252)
Constant	16.29***	20.64***	20.44***
	(0.00121)	(0.00959)	(0.0734)
Observations	663,262	296,383	296,383
Fixed Effects	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All estimates generated with PPML HDFE as described in the text.

Table 7: Regional Trade Agreements

	(1)	(2)	(3)
VARIABLES	Total Trade	Apparel Trade	China WTO Comparison
Better Work	0.355***	0.824***	0.910***
	(0.106)	(0.108)	(0.106)
China WTO			0.750***
			(0.228)
RTA	0.279***	-0.0931	-0.158
	(0.0539)	(0.181)	(0.236)
Constant	16.15***	20.64***	20.44***
	(0.0275)	(0.0685)	(0.138)
Observations	663,262	296,380	296,380
Fixed Effects	Yes	Yes	Yes

Notes: "RTA" stands for Regional Trade Agreement. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All estimates generated with PPML HDFE as described in the text.

Table 8: Including Tariffs

VARIABLES	(1) Total Trade	(2) Apparel
Better Work	0.480***	0.811***
	(0.153)	(0.172)
RTA	-0.173	-0.379*
	(0.108)	(0.215)
Tariff Preference Margin	0.046**	0.014
	(0.018)	(0.017)
Constant	9.432***	20.745***
	(0.032)	(0.046)
Observations	947,268	261,705

Notes: Tariff Preference Margin represents the difference between the agreement-specific mean tariff level and the MFN tariff level as reported in the Handbook of Deep Trade Agreements. The Tariff Preference Margin for Apparel is the sector-specific margin as reported at the two-digit level (HS61 and HS62) in the Handbook of Deep Trade Agreements. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. PPML with high-dimensional fixed effects (year, country, and country pair) is used to generate estimates in both columns.

Table 9: Product Concentration

VARIABLES	(1) HH Index	(2) Product Counts
Better Work	-0.0994***	199.7***
	(0.0338)	(10.27)
Observations	6,864	6,864
R-squared	0.326	0.917

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. "HH Index" stands for Herfindahl-Hirschman Index, which is a measure of concentration that is constructed by taking the sum of the squares of the shares in individual categories. The index increases as concentration increases.

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