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The trade effects of information provision about forced and child labor

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ABSTRACT

The issue of child and forced labor employed in the production of goods has been at a forefront of public debate in recent decades with millions of victims and nearly all countries being affected. This paper examines whether information about the use of child and forced labor in the production of goods affects their imports to the United States. I investigate this question using the largest naming and shaming strategy ever implemented world-wide: inclusion on the U.S. government's list of goods produced with child or forced labor. This list aims to provide impartial information to consumers and firms about a broad range of goods, in contrast to previously used measures in the literature which have tended to be more emotionally driven boycotts or labelling campaigns of specific goods. The paper finds that such information provision decreased United States imports of goods believed to be made using child and forced labor. The results are mainly driven by goods closer to the point of consumption, where consumers might reasonably be expected to penalize products that are thought to rely on such labor, while no effect was found for intermediate goods. Thus, public information strategies may be efficient policy instruments in disincentivizing the purchase of certain goods believed to be made with child and forced labor.

1. Introduction

Revelations about the use of child and forced labor have brought the issue of labor conditions to the forefront of public debate.[1] Despite numerous international efforts aimed at the prohibition of these labor practices, child and forced labor remains a challenge today. Indeed, the International Labor Organization (ILO) has estimated that there were around 25 million forced workers worldwide,[2] while over 150 million children between the ages of 5 and 17 were engaged in child labor[3] (ILO, 2017; 2018).

Given the scale and prevalence of the problem around the world, there have been debates about what proactive steps could be taken to mitigate exploitative labor practices.[4] One possible cost-effective strategy is to name and shame countries that are known to use child and forced labor in the production of their export goods. The rationale for this strategy is to inform importing governments, firms and consumers of the conditions under which various products are produced so that they can decide whether or not to purchase the goods. If importing firms and consumers choose to avoid buying the product as a result of information provision, then the market share of exploitative firms and countries is lost thereby giving them a clear incentive to cease their use of these exploitative labor practices (Freeman, 1994; Basu, 1999).

While naming and shaming is in principle a plausible strategy, no empirical study to date has examined whether it is effective in discouraging imports of goods believed to be produced with child and forced labor. This paper is the first to investigate this question by using the most prominent naming and shaming strategy ever implemented: the "List of Goods Produced by Child Labor or Forced Labor" (TVPRA list)[5] published by the U.S. Department of Labor (DOL). This list has the explicit intended purpose of raising public awareness about forced and child labor practices around the world and motivates governments, companies and civil society to combat the problem (United States Department of Labor, 2014). The list is conceived as an *information campaign* hence the paper only tests the effects of information about the use of child or forced labor

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[1] Prominent examples include child and forced labor in Uzbekistan's cotton fields (BBC, 2007; The Economist, 2013; The Economist, 2018), child labor and debt bondage in the production of agricultural products in Mexico (Los Angeles Times, 2014; Pulitzer Prize, 2014) as well as forced labor in the Thai prawn fishing industry (International Labour Organization, 2014; The Guardian, 2014b).

[2] 64% of these workers were engaged in the private economy. The remaining 36% of forced workers are involved in forced sexual labor (19%) and government-imposed forms of forced labor (16%).

[3] 70.9% of child labor is concentrated in agriculture, 17.1% in the services sector and 11.9% of child laborers work in an industry.

[4] For example, see Basu (1999) for a detailed discussion of child labor issues.

[5] TVPRA stands for the Trafficking Victims Protection Reauthorization Act and will be discussed in Section 2.

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in production itself.[6] Importantly inclusion or removal from this list does not depend on historical import volumes to the United States.[7]

Using this list, I create a novel dataset matching information about child and forced labor in the production of goods with all U.S. imports disaggregated by six-digit commodity good from all countries over the period 2001 to 2018. Listing is applied at a country-good level (e.g. shrimp from Thailand) in a particular year. Estimating the effect of listing of a particular country-good on its (subsequent) imports to the U.S. poses multiple endogeneity challenges. For instance, consider the possibility that the DOL decided to list countries at the same time as when their exports to the U.S. were about to decline (e.g. due to imposed sanctions). Then one could mistakenly interpret the negative coefficient from an estimation that compares listed and non-listed countries as the effect of listing. Similarly, suppose that some goods became listed at the same time as demand for them was about to decline, then an estimator comparing goods that became listed and the ones that did not, would be (wrongly) interpreted as the effect of TVPRA listing.

To address endogeneity concerns, this article adopts the three-way fixed effect approach.[8] Specifically, I use country-good fixed effects to control for a country's export level of a particular good, good-year fixed effects to take into account the U.S.'s general imports of a particular good in each year, and country-year fixed effects to capture U.S. imports from each country in a particular year. Thus, I explore the variation within country-good pairs over time and allow for heterogeneity at the baseline level of imports of certain goods from certain countries, the level of imports from a certain country in given years, and the level of imports of certain goods in specific years.

My findings suggest that U.S. imports of listed goods from listed countries dropped by around 17% as a result of appearing on the TVPRA list with the magnitude of the effect doubling over time. To explore further the mechanisms behind these findings, I examine whether this relationship between listing and imports is contingent on the type of a good. Specifically, I interact listing with the stage of production of each good. The results suggest that the relationship between listing and imports is robust for goods that are closer to the point of consumption, where consumers might reasonably be expected to penalize products that are believed to rely on such labor, while no statistically significant effect was found for intermediate goods. I further explore heterogenous effects by interacting listing with the sector of production, the duration of listing, listed countries' region, whether a good was listed for child, forced labor or both, and perceptions of countries by the U.S. consumers.

My findings are robust to a wide range of additional checks, including: varying the treatment windows, changing the control groups, using monotonic transformations of the dependent variable, excluding different countries depending on whether they pose political concerns to the U.S., and controlling for various economic and institutional characteristics. I also implement placebo tests to check that the effect is indeed statistically insignificant when randomly assigning listing to non-listed countries and goods. Finally, I also perform a Jack-knife robustness exercise to test whether outliers are driving my findings.

Thus, public information strategies may be efficient in disincentivising the purchase of certain imported goods that are believed to be produced with child and forced labor. The major policy implication of my findings is that extra-national policies[9] revolving around information provision are likely to cause drops in imports of the identified goods and hence might effectively incentivise a foreign government to improve labor practices in their country or a firm to change its production structure.

This paper contributes to three strands of the literature. The first examines how the public reacts to information about labor rights violations in the production of goods (Pruitt & Friedman, 1986; Freeman, 1994; Harrison & Scorse, 2010; Hainmueller, Hiscox, & Sequeira, 2015; Pigors & Rockenbach, 2016). For instance, Freeman (1994) suggests that consumers care about labor standards and that by providing information about the labor conditions that have gone into producing a good, the producer can give them a choice about which good to buy. He argues that even a small change in consumer behavior would significantly influence revenue, which would in turn push these companies to improve labor conditions. While this idea of labelling[10] may be appropriate for mitigating consumer guilt,[11] it has been criticised on the grounds of not being able to improve production conditions in developing countries (Brown & Drusilla, 2001). Another criticism concerns the difficulties associated with the provision of trustworthy information to consumers on labels and the associated monitoring and maintenance costs (Basu, 1999). Firms may also mislabel goods produced with poor labor conditions in order to benefit from higher market prices from the label (Freeman, 1994; Rodrik, 1996). Previous findings on the effects of labelling are mixed with some studies finding that it only affects a small portion of consumers (e.g. Dickson, 2001), while other papers show a substantial positive impact of Fair Trade labelling on sales (Hainmueller et al., 2015). My paper contributes to this literature in two ways. First, I investigate the effect of listing which is a more silent form of information provision than labelling. Second, previous research mostly analyzed the effects for single goods (e.g. coffee, socks), whereas this paper examines the responses from releasing information on a large number of products (e.g. the 2016 edition of the list included 139 unique goods). This allows me to explore regional, product and other forms of heterogeneity in the effect of information provision. Finally, the list is published by the U.S. government and thus is not subject to criticism of "mislabelling" that might happen if producers communicate their own labor practices.

A second related body of literature analyzes how shifts in consumer sentiment (broadly defined) can affect aggregate trade flows between countries (Michaels & Zhi, 2010; Fuchs & Klanna, 2013; Clerides, Davis, & Michis, 2015). While previous studies have found that consumer sentiment affects trade, they tend to focus on senti-

[6] Furthermore, it is worth emphasising that the focus of this paper is on the impact of child and forced *information provision* (as defined by the TVPRA list) on imports to the United States. The list cannot identify the number of child and forced laborers used in good production and therefore this study cannot identify any reduction in the number of child and forced laborers as a result of the list.

[7] Indeed the DOL states that it "*. . .did not distinguish between goods produced for domestic consumption and export, due to data limitations and because this was not part of the mandate of the TVPRA*" (United States Department of Labor, 2016).

[8] The empirical design of this paper is very similar to Frazer and Van Biesebroeck (2010).

[9] These are defined as a set of efforts in one country aimed at affecting child and forced labor levels in a foreign country.

[10] Labelling is one example of information provision which could include child labor free stickers, fair trade stickers on the physical good. Another example of information provision is listing which provides information in a way that does not physically mark the good. In a consumer survey Marymount University (1999), labelling was the preferred way for consumers to receive information (with 56% of consumers preferring it), and the listing was the second most preferred alternative chosen by 33% of responders.

[11] See also Baland and Duprez (2009) who in a theoretical paper argue that in cases where a minority of consumers react to labels warning of child labor use, there will be no impact on child worker wages and hence the overall incidence of child labor. They posit that child workers will substitute into producing child labor labelled goods (to sell to consumers who do not react to labels) while adult workers shift into producing other goods. Thus labelling induces worker changes between industries but not changes in the overall incidence of child labor. Basu, Chau, and Grote (2006) examine the effects of social labelling based on four features: child labor employment, consumer information, welfare, and trade linkages by employing a theoretical model. They find that consumers and firms benefit from social labelling. The trade sanctions of non-labelled products discourage trade but do not affect child labor levels.

ment changes that fundamentally emerge from political disagreements between countries. For instance, Michaels and Zhi (2010) found a drop in France-U.S. trade as a result of tensions emerging from the Iraq war, while Fuchs and Klanna (2013) presented a gravity model for 159 countries and found that exports to China declined after they were visited by the Dalai Lama. However, no paper to date has examined potential aggregate effects emerging from fundamentally empathetic responses, which for instance may arise in response to information provision about child and forced labor.

Third, previous studies have examined the link between labor standards and the export performance of countries (e.g. Basu, 1999; Brown & Drusilla, 2001; Cigno & Furio, 2002). A major challenge associated with using labor standards measures in such studies is endogeneity. To illustrate this issue, one key measure of labor standards used is the ratification of ILO conventions, but ratification is itself often strongly correlated with the level of social, economic and political advancement of a country. Furthermore, ILO conventions may not be binding and conversely the absence of ratification in a country does not always imply poor labor conditions. In order to overcome this endogeneity issue, researchers have used proxies of labor standards such as the number of strikes in a country, the rate of work injuries or indicators of trade union rights and democracy (Kucera & Sarna, 2006). This literature generally finds no clear evidence that bad labor conditions are associated with worse trade performance. While these studies therefore provide important findings, they have so far not focused specifically on information about child and forced labor violations in specific goods, which is the focus of the present article. By contrast, I examine the *informational effect* of child and forced labor violations, rather than the *existence of such labor standards*, on a country's comparative advantage or its exports performance. The TVPRA list used in this paper has also not been used in this literature before.

This article proceeds as follows. Section 2 provides more details on the TVPRA list and the mechanisms. The dataset is presented in Section 3, while the empirical approach is discussed in Section 4. Section 5 discusses the results, while Sections 6 and 7 examine the robustness of findings and heterogeneous effects. Section 8 concludes.

2. Background and mechanisms

2.1. Background

There are three broad types of interventions aimed at reducing child and forced labor (Basu, 1999).[12] The first type of intervention is *intranational*, which is a set of government laws, regulations or non-governmental programs aimed at deterring exploitative labor practices inside a country, for instance by providing access to education and nutrition (World Food Programme, 2003; The SOLD Project, 2007; Bangalore Rural Educational, 2013).[13] The second, *supranational*, type of intervention entails the collaboration of governments and international organizations with agreements aimed at the elimination of these labor practices globally. The work of the ILO and its underlying labor conventions is a good example of this type of intervention (ILO, 1930; 1957; 1973; 1999). The third, *extra-national*, type of intervention consists of a set of efforts in one country aimed at influencing child and forced labor levels in a foreign country. One such extra-national method is to "name and shame" countries that are known to use child and forced labor in the production of export goods. The rationale for this strategy is to inform the importing governments, firms and consumers of the conditions under which various goods are produced so that they can decide whether or not to purchase the goods. If importing firms and consumers choose to avoid buying the product, then the market share of exploitative firms and countries is lost and there is a clear incentive for them to cease their use of these exploitative labor practices (e.g. Freeman, 1994; Basu, 1999).

The most prominent extra-national strategy currently in use is the "List of Goods Produced by Child Labor or Forced Labor", which was established as part of the "Trafficking Victims Protection Reauthorization Act" (TVPRA). It was signed into law in 2006 with the aim of facilitating efforts to monitor and combat child labor and forced labor in the production of goods in foreign countries (Congress.gov, 2006). This list has been issued by the U.S. Government's Bureau of International Labor Affairs at the U.S. Department of Labor since 2009 and is submitted to Congress every year on December 1. In 2013, the TVPRA was amended to require the submission of the list biennially starting from December 2014. As a result, no list was published in 2015 or 2017, while in 2013 no new goods or countries were added and no regular report was published.[14] The report lists country-goods which are believed to use child and forced labor in their production process. For instance, Bangladesh is listed for its reliance on forced labor in the production of garments. The criteria for the selection of information on which the list is based are as follows: the nature of the information has to be considered relevant and be no more than 7 years old;[15] the source of the information is pertinent and probative; the information is corroborated by other sources; and the information shows significant evidence of child and forced labor practices (United States Department of Labor, 2016). The list aims to increase the awareness of governments, importing firms and consumers of the child and forced labor practices used in the production of goods.[16] It thereby seeks to promote efforts to combat child and forced labor issue, but it does not block imports to the U.S. if the good appeared on the list.

The U.S. Department of Labor (DOL) regularly considers removals of country-goods from the list if there is sufficient evidence that child and forced labor has been eliminated or reduced to a single case. The DOL conducts a number of checks before removals, which include *"desk reviews, in-person and telephone interviews with key informants, and when possible, travel to the relevant countries to conduct in-person interviews and site visits*" (United States Department of Labor, 2016). Between 2009 and 2016 only four country-goods have been removed from the TVPRA list since the list was first published. In 2013, three country-goods were excluded: tobacco from Kazakhstan, charcoal from Namibia and diamonds from Zimbabwe; and in 2016 garments from Jordan were removed from the list.

A number of governments have expressed explicit fears that inclusion on the list might have an adverse impact on their exports. One example is the Royal Thai Embassy (2010) which has criticized the inclusion of several Thai goods on the list, stating that the list risks *"damaging the country's reputation, and inflicting harm on the country's trade*". Another example is the response from the vice minister of Vietnam, Huan (2012), who reacted to the inclusion of Vietnam on the list by declaring that *"it might create negative effects on export of garment and brick from Viet Nam to the U.S.*

[12] Although the paper of Basu (1999) discussed the interventions in the context of child labor, these could also apply to the case of forced labor.

[13] Dammert, de Hoop, Mvukiyehe, and Rosati (2018) provide a comprehensive review of programs that affect child labor.

[14] Thus, in total 6 reports have been published between 2009 and 2016, in the years 2009, 2010, 2011, 2012, 2014 and 2016, respectively.

[15] Since 2011, the TVPRA restricted this threshold to 5 years.

[16] Note that the U.S. government also published the report "Findings on the Worst Forms of Child Labor" as well as the "List of Products Produced by Forced or Indentured Child Labor" report. While these reports overlap to a certain degree, they are not used in this paper. As a robustness check, regressions without including goods earlier mentioned in the "List of Products Produced by Forced or Indentured Child Labor" were performed and this did not change the main findings of this paper.

and other markets". Similarly, the Vietnam Chamber of Commerce and Industry (2012) stated that the addition of new goods from Vietnam on the list *"will definitely have an adverse impact on the product sales in the United States and over the world [sic]*". Some governments have also funded initiatives to be removed from the list. Thus, for instance, the Malaysian government allocated RM5 million to the Plantation Industries and Commodities Ministry to carry out a study in collaboration with the ILO with the stated aim of encouraging the DOL to remove Malaysian palm oil from the TVPRA list (New Straits Times, 2017). Finally, there are also a number of examples where companies themselves rely on the TVPRA list. The Walt Disney Company (2019), the Coca-Cola Company (2016) and Ford (2014) all relied on the list as one of the key sources for their Corporate Social Responsibility reports and Code of Business Conduct policies concerning the potential for child or forced labor in their supply chains.

Some U.S. states also explicitly rely on information from the list to inform their legislation and policy choices. For example, California in 2012 enacted "The California Transparency in Supply Chains Act". The law forces retailing and manufacturing companies that are doing business in the state of California and have at least $100 million in gross annual revenue globally to disclose their efforts for eliminating slavery and human trafficking practices from their supply chains. The act explicitly cites the extent of child and forced labor reported in the TVPRA list as the primary motivation for the reporting requirements. However, the act does not request companies to undertake any actions if forced labor takes place, but instead requires these firms to disclose this information to its consumers and the general public. These reporting requirements are likely to accentuate the effect of this list as a company must disclose, in a prominent place on their website, the labor conditions in their supply chain. As such, the presence of a supplying country-good on the TVPRA's list is likely to be problematic for a company that has to disclose their relationship with this country.[17]

This list differs in crucial respects from previous awareness campaigns that have been studied in the literature. A key feature of other awareness campaigns is that they were focused on a specific sector and tried to target consumers by using media directly to elicit an emotional response. By contrast, the TVPRA list is not actively promoted by the United States government and is intended to provide importing firms as well as consumers with trustworthy and neutral information about goods that are at high risk of being produced using child or forced labor. Updates to the list, however, are often covered in major global media sources such as New York Times (2012), The Guardian (2014a), CNBC (2016), and Reuters (2020). Thus, an informational effect of the list *could* in principle operate via greater media attention.

There are a number of concerns that have been raised about the evidence base, transparency of selection of goods and countries as well as the addition and removal of countries from the list (European Commission, 2013). The DOL itself admits that there are constraints when producing the list including data availability, the disproportional appearance of some countries on the list, and countries with information gaps (United States Department of Labor, 2014). To the extent that they diminish public confidence in the list, these criticisms will therefore act against finding a significant effect impact on trade. The focus of this paper is on the effect of information provision, rather than the impact of the total number of child and forced workers, on trade.

[17] Note that in Appendix F I examine whether this act drives the result of this paper. I find that my findings are robust to the exclusion of California as well as the restriction of time to the years before the Californian act was implemented.

2.2. Mechanisms

Appearing on the TVPRA list can potentially affect imports by changing the behavior of the following agents: consumers, importing firms and listed governments. For each, we can describe reasons for why they would adjust their economic decision making in response to the listing. First, consumers might decide not to buy (or to buy less) products featured on the list to boycott the production of goods believed to use child and forced labor. They could try to reduce their consumption in cases where alternative goods are available and affordable. In the more extreme case, they could also choose to boycott entirely the consumption of goods believed to be produced with child and forced labor. This behaviour is also consistent with many historical examples of consumers reacting to negative information about good production by ceasing to buy the good. For instance, the "American Free Produce Association", formed in 1838 (Nuermberger, 1942), opposed slavery in the Southern states and took action by advocating for consumers to only buy goods produced without the use of slaves. Consumer boycotts of sweatshops in the 1990s also illustrate how consumers refrained from buying goods due to concerns about the production process and working conditions. More recently, Kailash Satyarthi, a 2014 Nobel Peace Prize laureate, advocated for consumers to boycott goods produced using child labor (Gowen & Lakshmi, 2014).[18] In addition to these historical examples, the view that consumers care about labor standards is supported by findings from surveys (e.g. Walk Free Foundation (2015) for the US) and literature (Freeman, 1994, 2010, 2015, 2021). Following these expectations that consumers should care about and react to listing information, we should observe a negative effect of listing on imports. The negative effect should be more pronounced when the listed goods are closer to the point of consumption since the consumers should have both higher awareness of listing in these goods and more ability to adjust their behavior in response to listing. Thus, the negative effect of listing should be stronger in consumer goods than in intermediate goods.

Second, if appearance on the list informs firms and their shareholders of potential child and forced labor violations in the production of goods that they import, they may then respond by seeking imported goods elsewhere in fear of consumer backlash (Becchetti, Salustri, & Scaramozzino, 2019; Buell & Kalkanci, 2021), to maintain their reputation (Bénabou & Tirole, 2006), use it as a differentiation strategy (Baron, 2001; Siegel & Vitaliano, 2007), or to improve working conditions abroad (Pruitt & Friedman, 1986; Freeman, 1994).[19] In the case of goods that firms pass on directly to consumers (i.e. consumption goods), this could be primarily driven by concerns about consumers' adverse reaction to listed goods. Even in the case of intermediate goods that are not directly observed by consumers, the motivation could still be that the negative information shock would lead to reputational damage, thereby undermining trust in the entire supply chain or ethical practices of the company in question. Indeed, recent findings show that firms care about higher labor standards (Harrison & Scorse, 2010; Malesky & Mosley, 2018; Tanaka, 2020) and can benefit from them (e.g. Hainmueller et al., 2015; Pigors & Rockenbach, 2016; Distelhorst & Locke, 2018; Buell & Kalkanci, 2021). Anecdotally, there have also been cases of firms boycotting products from certain countries such as the world's largest retailer Walmart launching a boycott of Uzbekistan's cotton in 2008 (Birchall, 2008).

[18] Specifically Kailash Satyarthi advocated for boycotts of Indian carpets produced with child labor.

[19] There is also related literature on the effects of information shocks on reputation and value of firms (Barber & Darrough, 1996; Tadelis, 1999; DellaVigna & La Ferrara, 2010).

Finally, given the potentially negative reactions by consumers and firms of the importing country to the listing of a good, the exporting governments of listed countries may have an incentive to react to listing as well. To the extent that listing is hard to compensate or alter by the offending governments, they could instead decide to regulate or even shut down the listed industry to improve labor standards. The lower supply of listed goods exports could in turn reduce trade in the short to medium term. Such a response could be motivated by a fear to lose trade with an important economic partner, especially in the case of the US, not just in the listed good, but also beyond if importing consumers and firms fail to distinguish between goods within a listed firm or even within a listed country. The governments of listed countries could also have other altruistic motivations, for instance a genuine concern about discovering these poor labor practices in a particular industry or firm. This response would thereby slow down the race to the bottom[20] (see Brown & Drusilla, 2006; Mosley & Uno, 2007; Mosley & Singer, 2015 for excellent discussions). Whilst there is evidence of some countries expressing fears about their goods being included, investing in better labor practices tend to be rather rare exceptions.

3. Data

The starting point for assembling the dataset was the "The List of Goods Produced by Child Labor or Forced Labor". In total there are 139 goods in the list.[21] I match each good description to the harmonized system six-digits (HS6) level commodity codes. The majority of 139 listed good descriptions matched with multiple commodity codes. Then I extract the imports values as reported by the USA Trade Online system of the U.S. Census Bureau (2022) for every country and commodity code for every year from 2001 until 2018. The resulting sample therefore consists of 231 countries: 75 countries were listed for at least one good while the remaining 156 countries did not have any goods on the list.[22] Overall, 379 listed goods and country combinations appeared on the list between 2009 and 2016.[23] The annual additions of goods, countries and country-goods (i.e. listed country and listed good combinations) are shown in Table 1.[24]

To ascertain whether the DOL listed country-goods get more media coverage and mentions in international organization reports, I construct two other information measures.[25] The first measure is a logarithm of media mentions. It captures all articles mentioning child and forced labor in all countries from the US and international newspapers between 2001 and 2018. These article counts were obtained from Bloomberg terminal.[26] The top panel of Fig. 1 presents the logarithm of media mentions for TVPRA listed countries against not-listed countries. As expected, countries that were listed have a higher number of mentions in connection with labor rights in the media in all years.

I supplement the analysis with a second information measure, which is an index compiled from the International Labour Organization website concerning child and forced labor in all countries in certain years.[27] Specifically, I focus on all ILO reports, articles and news mentioning child and forced labor in all countries between 2001 and 2018 and then calculate the total of child and forced labor mentions.[28] The bottom panel of Fig. 1 plots the ILO mentions for listed countries against not listed countries. This shows that countries that have been listed for at least one good are more likely to appear in an ILO report about the use of child and forced labor. Together the findings of Fig. 1 indicate that while political manipulation could be a valid concern, the TVPRA list is in broad agreement with the other available data sources.

I present summary statistics in Table 2. Panel A focuses on import values, panel B on the media coverage, while panel C presents summary information for the ILO measure. All import values are higher for ever-listed country-goods than for never-listed country-goods;[29] consistent with the idea that child and forced labor tend to be used in goods that a country specialises in exporting. Capital goods appear to have the highest value followed by consumption and intermediate goods. Panel B reveals that listed countries appear to receive more media coverage than non-listed countries. Similarly, panel C splits country-specific variables between listed countries and non-listed countries. Listed countries are mentioned in more ILO forced and child labor reports and news, as compared to the non-listed countries. The number of ILO reports increased since listing began in 2009.

Fig. 2 shows which countries appeared on the list and for how many goods they were listed.[30] India has the highest number of listing among all countries with 23 listed goods, followed by Brazil and Vietnam with each being listed for 16 goods. The majority of listed countries are from the Asia-Pacific region, followed by Latin America and the Caribbean region. The majority – over 65% – of listed countries are low income or lower middle-income economies.[31] Sub-Saharan Africa and Latin America & Caribbean account for more than half of listings for child laborers, while most of TVPRA's listing of forced labor good-countries (more than a third of all listings) are for East Asian & Pacific countries.

The majority of goods that appeared on the list are labor intensive rather than capital intensive. This is in line with previous literature such as Busse (2002) who finds a positive relationship between child labor and exports of unskilled labor intensive goods. He argues this occurs because reliance on child and forced labor increases the comparative advantage of unskilled labor intensive goods in export markets. The TVPRA list monitors production at different points of a supply chain including consumption, intermediate and capital goods. Table 3 displays the proportion of listed goods in each category. The bottom panel of Table 3 presents at which stages of production child and forced labor might be

[20] This occurs when in order to attract foreign investments, governments lower labor (among others) standards.

[21] There are four goods that could not be included in the dataset due to a lack of imports data. These are miraa and coca (both stimulant plants), tanzanite and pornography.

[22] All trade values were deflated to 2000 $U.S. with the HS2 U.S. import price indexes available from the U.S. Bureau of Labor Statistics (2022).

[23] Appendix B describes all data sources used for the analysis in this paper.

[24] Note that there were some removals from the list, which means the running total differs from the summation of the additions. In 2013, there were no new additions to the list and no regular report published. Instead, ILAB removed three goods from the list in 2013: tobacco from Kazakhstan, charcoal from Namibia, and diamonds from Zimbabwe. In 2016, ILAB removed garments from Jordan.

[25] A detailed discussion of the construction of these information measures is available in Appendix C.

[26] In addition, I create another media measure that varies at a country-good level. It captures the mentions of child and forced labor in listed goods in all countries for 8 major U.S. newspapers and 20 regional newspapers between 2004 and 2015 in Appendix C. This index is created based on the data from the Proquest library. Unfortunately, due to the closure of the website, it was not possible to collect all necessary data for the entire period my study.

[27] The ILO is the leading international organization examining labor issues and has a special focus on researching and counteracting child and forced labor internationally. The ILO's "International programme on the elimination of child labor" is the largest dedicated child labor program in the world (International Labor Organisation, 2017). In terms of forced labor, the ILO established their "Special Action Programme to Combat Forced Labor" in 2002. This unit later published the first quantitative global estimate of forced labor prevalence in 2005 and has regularly undertaken research aimed at monitoring and combating forced labor internationally.

[28] I also create an ILO measure for listed goods from listed and non-listed countries which I discuss in Appendix C.

[29] While no listing occurred before 2009, I define as ever listed all country-good combinations that ever appeared on the list.

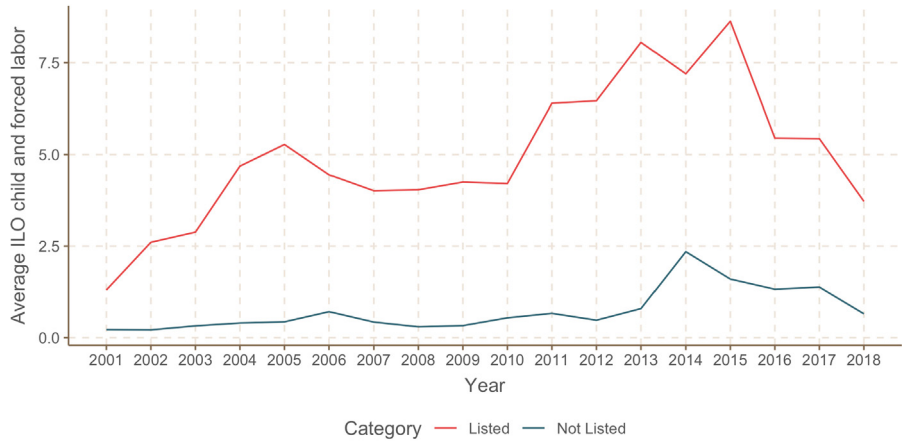
[30] Note that the graph includes all country-goods that appeared on the list, while excluding the country-goods for which trade data is not available.

[31] The only high-income country listed is Panama.

Table 1
Additions of goods and countries to the TVPRA list, by year.

	2009	2010	2011	2012	2014	2016	Total
Unique goods on list	122	6	2	4	2	3	139
Unique countries on list	58	12	1	3	1	2	75
Country-goods added	281	30	8	26	11	27	379
Total country-goods	281	311	319	345	353	379	

(a) Media mentions



(b) ILO mentions

Fig. 1. Media and ILO mentions. Note: the figure shows the ILO index and the media mentions created from the U.S. and major international newspapers for listed and non-listed countries between 2000 and 2018.

employed. All six digit HS commodity codes were matched with the Broad Economic Categories Classification and then divided into stages of production. The first column reports the number of goods belonging to each stage of production, while the second column describes the percentage share of that good out of the total number of goods. The third column in the table then provides the share of goods in terms of their dollar value (in total U.S. imports) by their production stage. Approximately half of the listed goods are intermediate goods. However, their combined share in trade value is only 22.2%. Consumption goods have the highest concentration in total imports followed by capital products which account for over 11% of imports. The top panel of Table 3 presents the sectors which could be using child and forced labor. The majority of goods that appeared on the TVPRA list come from the manufacturing sector (by both number of HS codes and by value) followed by agriculture products which account for 38% of all codes and 10% of imports.

4. Empirical strategy

In order to examine whether and to what extent the listing of forced and child labor practices of goods coming from various countries affects trade flows, I use the following benchmark specification:[32]

$$\text{IMP}_{ijt} = \beta_0 + \beta_1 \text{Listed}_{ijt-1} + \theta_{ij} + \phi_{jt} + \lambda_{it} + \epsilon_{ijt} \quad (1)$$

[32] Methodologically this specification is comparable to Frazer and Van Biesebroeck (2010).

Table 2
Summary statistics.

Panel A:Imports values						
	Listed country listed goods obs.	Listed country listed goods mean	Listed country listed goods SD	Not-listed country not-listed goods obs.	Not-listed country not-listed goods mean	Not-listed country not-listed goods SD
All	229,356	US$ 7.686	US$ 117.10	25,899,516	US$ 1.1140	US$ 70.07
2001–2009	114,678	US$ 6.791	US$ 108.40	12,949,758	US$ 0.9593	US$ 55.34
2010–2018	114,678	US$ 8.582	US$ 125.30	12,949,758	US$ 1.2690	US$ 82.20
Consumption	102,348	US$ 11.410	US$ 102.50	-	-	-
Intermediate	123,840	US$ 3.159	US$ 111.10	-	-	-
Capital	3,168	US$ 64.300	US$ 408.00	-	-	-
Agriculture	114,678	US$ 1.465	US$ 21.81	-	-	-
Manufacturing	105,426	US$ 14.100	US$ 164.00	-	-	-
Mining	9,252	US$ 11.660	US$ 163.20	-	-	-
Child Labor	134,226	US$ 4.339	US$ 72.43	-	-	-
Child and Forced Labor	88,272	US$ 12.730	US$ 164.00	-	-	-
Forced Labor	6,858	US$ 8.226	US$ 96.55	-	-	-

Panel B:Average Bloomberg mentions						
	Listed country obs.	Listed country mean	Listed country SD	Not-listed country obs.	Not-listed country mean	Not-listed country SD
All	1,368	0.95	2.2	2790	0.43	1.4
2001–2009	684	0.87	1.9	1395	0.39	1.1
2010–2018	684	1.00	2.5	1395	0.46	1.6

Panel C:Average ILO child and forced labor mentions						
	Listed country obs.	Listed country mean	Listed country SD	Not-listed country obs.	Not-listed country mean	Not-listed country SD
All	1,368	4.9	9.2	2790	0.73	2.2
2001–2009	684	3.7	6.4	1395	0.37	1.5
2010–2018	684	6.2	11.0	1395	1.10	2.7

Note: all trade values (deflated) are to 3 significant figures and expressed in millions of U.S. dollars. Newspapers circulations are total of child and forced labor mentions (but no log applied). SD stands for standard deviation while obs. stand for observations.

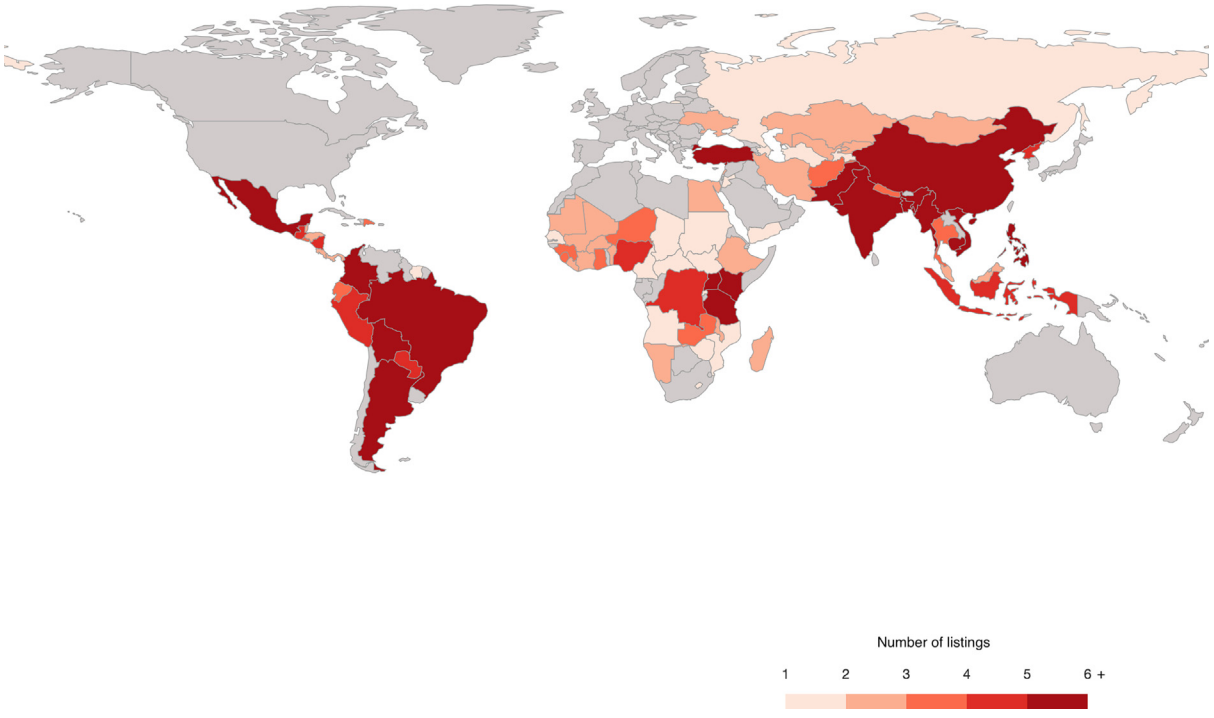


Fig. 2. Note: Listed countries. The map shows the intensity of listing by each country as of 2016 list edition. A darker red color on the map implies more listing. Grey represents countries that did not appear on the list. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Table 3
Composition of ever listed HS6 codes.

By sector of production	Number of HS6 codes	Percentage of HS6 codes	Percentage of value
Agriculture	707	38.0 %	9.5 %
Manufacturing	1,004	54.0 %	84.3 %
Mining	149	8.0 %	6.1 %
By stage of production			
Consumption	872	46.9 %	66.3 %
Intermediate	912	49.0 %	22.2 %
Capital	76	4.1 %	11.6 %

Note: Stage of production was allocated according to the Broad Economic Categories classification.

The dependent variable, IMP_{ijt} is the inverse hyperbolic sine transformation of imports, which are measured in U.S. dollars and discounted by the applicable industry-specific U.S. price indices from country i of six-digit commodity j at time t.[33] The regressor of interest, $Listed_{ijt-1}$ is a binary variable that equals one if a good appeared on the TVPRA list and zero otherwise. It is lagged by one year to reflect the fact that listing occurs in December, while the trade data is recorded at the annual level.[34] Next, the coefficient β_1 measures the change in imports into the U.S. for listed products coming from listed countries once the listing occurred compared to the base before listing. This benchmark specification includes country-commodity θ_{ij}, commodity-year ϕ_{jt} and country-year λ_{it} fixed effects. ϵ_{ijt} is the statistical error term. Unless indicated otherwise, I use robust standard errors clustered at a commodity level in all estimations.

The fixed effects approach controls for time-invariant heterogeneity that occurs at a country and good level. This is a natural assumption in the international trade context as countries specialize in the production of various goods. Some examples are the large shrimp industry in Thailand and cocoa industry from Cote d'Ivoire, which are a result of those country's respective natural endowments. Similarly, countries, where labor is relatively abundant, continue to specialize in labor intensive goods, for instance, garments in Bangladesh and electronics in China. By including country-commodity fixed effects we can explain changes in trade caused by time variant factors including the time variant controls and the treatment of interest, i.e. information revelation. Thus this identification strategy exploits only internal variation in trade flows between the U.S. and a certain country for a particular commodity over time.

Next, the second pair of fixed effects at commodity and year level allows for heterogeneity in imports of a specific good into the U.S. in a particular year. The third fixed effects pair at country-year level accounts for unobserved shocks to exporting countries that can occur over time. For example, if a country was subject to import sanctions that were lifted, the U.S. DOL might include some goods from this country into the TVPRA list to warn U.S. consumers. Similarly, this would capture the introduction (or removal) of trade agreements between the U.S. and other trading countries.

As a result of these three pairs of fixed effects, the only variation that is left is temporal at the country-good level. This variation could still be driven by factors that are themselves related to the probability of listing thereby reintroducing endogeneity concerns. For instance, one possibility is that goods that are produced by forced/child labor become more competitive over time relative to goods that do not. This would in turn lead them to sell more goods (i.e. imports to the U.S. would increase relative to other country goods). While plausible, this would essentially stack the cards in favor of finding that listing is (spuriously) positively related to imports to the U.S.; the opposite of what one would expect to find if listing disincentivises imports.

A different threat to identification arises if producers of country-goods that are becoming less competitive over time – and hence suffer from falling imports – are more likely to adopt forced/child labor in an effort to compensate for their declining selling performance. If these struggling producers in turn become more likely to get listed than other firms that do not face such competitive struggles, then a spurious negative association could be observed. Crucially, this would require *both* the adoption of child/forced labor to be the result of competitive pressures due to rising costs (and falling imports) *and* the inability of this response to stop the falling imports later on. The presence of both conditions seems a priori implausible.

5. Results

Table 4 presents the results for the response of imports to TVPRA listing estimated on a balanced panel for all countries, for all goods worldwide between 2001 and 2018.[35] The results of the specification 1 that includes country-commodity, commodity-year, and country-year fixed effects are in column (1).[36] The coefficient of interest estimates the effect of TVPRA listing on imports into the United States and indicates that the listing is associated with a substantial 17% decline in imports.[37] Columns (2) and (3) show the results when restricting the sample to only TVPRA listed goods (i.e. a product that appeared on the list at least once for one country) and only TVPRA listed countries (i.e. a country that was listed at least once for one good), respectively. Both estimated coefficients are statistically significant at all conventional levels. The coefficient in column (2) indicates an 11% fall in imports in response to the listing, whilst the column (3) coefficient indicates a fall of approximately 29%.

Columns (4) to (6) in Table 4 use the same specifications as the first three columns but rely on a different dependent variable

[33] The results are robust when $\log(Imports_{ijt}+1)$ are used in place of the inverse hyperbolic sine transformation of imports.

[34] For example, a response to a listing occurring in December 2013 would only be expected in 2014.

[35] In addition, I replicate the results using bootstrapped standard errors and standard errors clustered by country. The results remain robust and are available upon request.

[36] The data structure of this paper is comparable to Frazer and Van Biesebroeck (2010). The treatment in their paper (i.e. trade concessions) was applied uniformly across all the African countries. Therefore, when the authors restrict their samples to treated countries and treated goods only, they need to omit fixed effects. Otherwise, the treatment variable would drop out. However, this is not the case in this paper as the treatment was not applied uniformly for each country.

[37] I test whether trade recovers for goods that were removed from the list. The finding presented in Appendix H where I include a control for delisted countries-goods. The results show that once a good was taken off the list, their trade with the U. S. improves.

Table 4
Benchmark results of the TVPRA listing.

Sample:	Full	Only TVPRA goods	Only TVPRA countries	Full	Only TVPRA goods	Only TVPRA countries
Dependent variable:	IMP (1)	IMP (2)	IMP (3)	Import Dummy (4)	Import Dummy (5)	Import Dummy (6)
Listed t-1	−0.192***	−0.116***	−0.342***	−0.015***	−0.011***	−0.016***
	(0.033)	(0.030)	(0.040)	(0.002)	(0.002)	(0.002)
Commodity-Year	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Country	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,128,872	7,733,880	8,596,512	26,128,872	7,733,880	8,596,512
R^2	0.795	0.788	0.767	0.723	0.718	0.702

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In columns (1)–(3), the dependent variable is the inverse hyperbolic sine transformation of imports and in columns (4)–(6) it is the dummy variable of imports to the United States. The models include a full set of country-year, commodity-year, and commodity-country effects unless indicated otherwise. Within R^2 are presented.

Table 5
Effect of TVPRA listing by time from listing.

	Dependent variable:	
	IMP (1)	Import Dummy (2)
First Year Listed	−0.071**	−0.006**
	(0.032)	(0.003)
Second Year Listed	−0.091***	−0.008***
	(0.033)	(0.003)
Third Year Listed	−0.125***	−0.011***
	(0.037)	(0.003)
Fourth Year Listed	−0.172***	−0.015***
	(0.038)	(0.003)
Fifth Year Listed	−0.208***	−0.016***
	(0.041)	(0.003)
Sixth Year Listed	−0.211***	−0.016***
	(0.042)	(0.003)
Seventh Year Listed	−0.230***	−0.016***
	(0.046)	(0.003)
Eights Year Listed	−0.286***	−0.019***
	(0.046)	(0.003)
Ninth Year Listed	−0.323***	−0.021***
	(0.051)	(0.004)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column (1), the dependent variable is the inverse hyperbolic sine transformation of imports and in column (2) it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Within R^2 are presented.

Table 6
Effect of the TVPRA listing by year of first listing.

	Dependent variable:	
	IMP (1)	Import Dummy (2)
Listed First in 2009	−0.304***	−0.022***
	(0.042)	(0.003)
Listed First in 2010	0.021	0.002
	(0.048)	(0.004)
Listed First in 2011	0.111	0.009
	(0.106)	(0.010)
Listed First in 2012	0.061	−0.002
	(0.084)	(0.006)
Listed First in 2014	−0.009	−0.003
	(0.054)	(0.004)
Listed First in 2016	−0.417***	−0.023**
	(0.127)	(0.010)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Constants are not reported. Within R^2 are presented.

called "Import Dummy". It is a binary indicator capturing the presence of an importing relationship, which takes value of one if trade was positive and zero otherwise.[38] The estimate in column (4) shows that inclusion into the TVPRA list decreases the likelihood of a good being imported to the United States by 1.5%. The results in columns (5) and (6) are also negative and statistically significant, indicating the decline in the likelihood of imports of listed goods.[39]

Next, I consider the timing of the listing effect in Table 5. This is important because, it is possible that firm-importers of listed products are locked into contracts and hence unable to break the relationship with a source company straight away when the list just gets released. It might also take time for firms to find alternative suppliers in a different (i.e. non-listed) country. Alternatively, many consumers might become more knowledgeable about goods produced using child or forced labor only over time. To allow for timing to play a role, I split the effect of listing by years since listing and present the results for all years since the listing occurred. Three results are noteworthy. First, listing reduces imports to the United States every year. Second, the impact of listing increased substantially over time, from about 7% to 28%. Third, the finding in column (2) suggests that the effects of listing on the likelihood of importing a product to the U.S. increases over time, from 0.6% to 2.1%.

The number of country-goods added varied substantially with every TVPRA update (as evident from Table 1). For example, the release of the list had 281 country-good combinations, while the update the following year added 30 country-goods, followed by the addition of just 8 country-goods in 2011. Therefore, I explore whether the year of addition to the list matters. The results are presented in Table 6 and include a full set of fixed effects. They show that United States imports were negatively affected the most by listing in 2009 and 2016. This also suggests that results are not predominantly driven by a specific listing year. The magnitude of the effect for the listing in 2009 (the first edition) is 26%; while the

[38] This essentially estimates the extensive margin.
[39] I also find evidence for the negative effect of listing with a less restrictive country-good and year fixed effects structure in Appendix G.

Table 7
Replication of benchmark results with a different control group.

Sample:	Full	Only TVPRA goods	Only TVPRA countries	Full	Only TVPRA goods	Only TVPRA countries
Dependent variable:	IMP	IMP	IMP	Import Dummy	Import Dummy	Import Dummy
Listed t-1	−0.244***	−0.134***	−0.201***	−0.019***	−0.013***	−0.016***
	(0.034)	(0.030)	(0.032)	(0.002)	(0.002)	(0.002)
Commodity-Year	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Country	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,496,344	4,586,760	8,596,512	15,496,344	4,586,760	8,596,512
R^2	0.757	0.776	0.782	0.677	0.694	0.702

Note: Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at a commodity level. In columns (1)–(3), the dependent variable is the inverse hyperbolic sine transformation of imports and in columns (4)–(6) it is the dummy variable of imports to the United States. The models include a full set of country-year, commodity-year, and commodity-country effects unless indicated otherwise. Within R^2 are presented.

TVPRA update in 2016 (27 country-goods added) is associated with a 34% decline of imports into the United States.

6. Robustness checks

I carry out a number of robustness checks concerning the control group, restricting the number of years before and after listing, using an alternative dependent variable, and testing for the presence of the effect prior to listing. I also carry out three types of placebo tests and Jack-knife tests for both countries and goods. My results remain robust throughout and I discuss each robustness check in turn in the next paragraphs.

I begin by considering a different control group.[40] All specifications until now used all countries in the world as a control group. However, the majority of listed countries are low and middle-income economies and the export composition of listed countries is likely to differ from more advanced economies. Therefore, I remove all high-income countries as defined by the World Bank (2022) and re-estimate the same specifications as in Table 4. The results are presented in Table 7 and remain robust.

In a second robustness check, I vary the duration of the treatment window. The challenge for this paper is twofold. On the one hand, fewer changes could have occurred during a short treatment window providing a "cleaner" result. On the other hand, it might have taken firms time to exploit and arrange production of the same goods in non-listed countries or for consumers to become more informed and react to the listing. Thus I re-estimate the benchmark specification using the inverse hyperbolic sine transformation of imports and import dummy with various treatment windows. Table 8 presents these results for three, four, five and six years before and after listing. The results remain negative and statistically significant. The magnitude of the coefficients is smaller in the shorter event window. This is to some extent not surprising because the size of the effect increases over time, consistent with the notion that it takes time for firms and consumers to acquire the information about the listing and/or adjust their purchasing behavior (as shown in Table 5). In addition, there is a smaller number of listed goods and countries present in estimations with shorter event windows.

The results presented so far used the inverse hyperbolic sine transformation of imports as the dependent variable. However, other studies have also used the logarithm of imports (e.g. Frazer & Van Biesebroeck, 2010; Michaels & Zhi, 2010). Therefore, the third robustness check considers this alternative regressand. I use the established transformation of trade data – the logarithm of imports.[41] The results with this alternative dependent variable are in Table 9. All estimates are negative and have very similar magnitudes as previous findings in Table 4. The estimate for column (1) indicates a 16.6% decline in imports, while in Table 4 the coefficient shows a 17.4% drop.

Next, the fourth robustness check re-estimates the baseline specification using leads (prior to listing event) and lags of the listing (after the listing had occurred).[42] Table 10 reports these results using the full set of fixed effects. I consider three dependent variables: inverse hyperbolic sine transformation of imports, the logarithm of imports, and an import dummy coded one if there are positive imports and zero if there are no imports. The estimates in all three cases clearly show that the effect switches sign and statistical significance: from positive and insignificant prior to listing, to negative and statistically significant *after* listing announcement; and the magnitude of the effect increases gradually over time.

In my fifth robustness check, I carry out three placebo tests. In the first placebo test, I test whether the negative listing effect is driven by the nature of a good itself. First, I drop from my sample all listed countries. Second, I then randomly sample 1% of the remaining country-goods and assign them as being listed at some random year in the period when listing occurred (i.e. 2009 – 2012, 2014, 2016) with an equal probability for each year.[43] I estimate Eq. 1 and for each regression I record the coefficient of listing. I repeat this procedure 500 times to get a sample of coefficients corresponding to the case where the listing is randomly assigned. In the second placebo test, I check whether or not the negative effect of listing could come about due to less trade generally taking place with countries that appeared on the list for particular goods. To do this I repeat the same exercise as in the first placebo test but with a different assignment of placebo listings. Specifically, I now focus on non-listed country-goods from countries that had been listed for at least one other good. I do this for a listing in a random year in the range of 2009, 2010, 2011, 2012, 2014 and 2016. In the third placebo test, I drop from my sample all country-goods that were listed at least one year, which represents about 1% of my sample. I then randomly sample 1% of the remaining country-goods and assign them as being listed at some random year in the listing period (with an equal probability for each year) and all years following. I estimate Eq. 1 and record the coefficient of listing. I do this 500 times to get a sample

[40] In Appendix G I test for the presence of negative weighs (De Chaisemartin & d'Haultfoeuille, 2020) that could bias the findings.

[41] This dependent variable is created by adding one unit to all import values before taking logarithms.

[42] I aggregate the data into two-years to reduce the effect of the noise from the 2008 financial crisis.

[43] Please note that the conclusion of this test does not change if I restrict my sample to the full range of 2009 – 2016.

Table 8
Replication of benchmark results with different time windows.

Sample:	2004–2016	2004–2016	2005–2015	2005–2015	2006–2014	2006–2014	2007–2013	2007–2013
Dependent variable:	IMP	Trade Dummy	IMP	Trade Dummy	IMP	Trade Dummy	IMP	Trade Dummy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Listed t-1	−0.180***	−0.013***	−0.179***	−0.013***	−0.128***	−0.009***	−0.048*	−0.004*
	(0.031)	(0.002)	(0.030)	(0.002)	(0.028)	(0.002)	(0.025)	(0.002)
Commodity-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,870,852	18,870,852	15,967,644	15,967,644	13,064,436	13,064,436	10,161,228	10,161,228
R^2	0.820	0.748	0.830	0.759	0.843	0.774	0.863	0.795

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In columns (1), (3), (5) and (7) the dependent variable is the inverse hyperbolic sine transformation of imports and in columns (2), (4), (6) and (8) it is the dummy variable of imports to the United States. The models include a full set of country-year, commodity-year, and commodity-country effects unless indicated otherwise. Within R^2 are presented.

Table 9
Replication of benchmark results with the logarithm of trade.

	Dependent variable:		
	Log Import		
	(1)	(2)	(3)
Listed t-1	−0.182***	−0.108***	−0.190***
	(0.032)	(0.029)	(0.031)
Commodity-Year	Yes	Yes	Yes
Commodity-Country	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. The dependent variable is the logarithm of imports to the United States. The models include a full set of country-year, commodity-year, and commodity-country effects unless indicated otherwise. Within R^2 are presented.

Table 10
The trade effects before and after listing.

	Dependent variable:		
	IMP	Import Dummy	Log Import
	(1)	(2)	(3)
Before − listing$_{t-3,t-4}$	0.042*	0.001	0.042*
	(0.025)	(0.002)	(0.024)
Before − listing$_{t-1,t-2}$	0.042	0.003	0.040
	(0.027)	(0.002)	(0.026)
After − listing$_{t,t+1}$	−0.078**	−0.008***	−0.073**
	(0.037)	(0.003)	(0.035)
After − listing$_{t+2,t+3}$	−0.172***	−0.015***	−0.161***
	(0.043)	(0.003)	(0.041)
After − listing$_{t+}$	−0.247***	−0.018***	−0.234***
	(0.039)	(0.003)	(0.037)
Commodity-Year	Yes	Yes	Yes
Commodity-Country	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes
Observations	24,677,268	24,677,268	24,677,268
R^2	0.797	0.726	0.801

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports, in column 2 it is the dummy variable of imports and in column 3 it is the logarithm of imports to the United States. All models include a full set of country-year, commodity-year, and commodity-country effects. Constants are not reported. Within R^2 are presented.

of coefficients corresponding to the case where the listing is randomly assigned. The density of the placebo coefficients for all three cases can be seen in Fig. 3. The figure shows that the observed coefficients are centred around zero, and that the benchmark result of 0.192 is inconsistent with these distributions.

Finally, I test whether my results are driven by the presence of outliers. For example, it could be that only some countries were strongly affected by listing, whereas for others the effect was negligible. To test whether this is a problem I use a Jack-knife robustness exercise for countries and goods, respectively. First, I re-estimate my benchmark specification while excluding one country one at a time. Second, I re-estimate the same specification while excluding each two digit HS commodity code at a time. Since the dataset used in this analysis is at the six-digit level, implementing the Jack-knife method at such disaggregated level would inevitably lead to statistically significant results for most (if not all) specifications because the effect of each commodity exclusion would be very small compared to the total overall sample size. To achieve a more robust result, I instead exclude commodity codes at the (higher) two-digit level[44]. I plot the kernel density of listing coefficients in Fig. 4 for the country and the goods Jack-knife robustness checks. The magnitude of plotted coefficients in both Jack-knife cases is very close to the estimated −0.192 in column (1) of Table 4. This indicates that my results are unlikely to be driven by the presence of country and goods outliers.

7. Heterogeneous effects

In this section, I explore heterogeneity of the listing effect and the potential mechanism behind my findings. In particular, I look at heterogeneity across production stages, sectors, regions, type of labor and relationship with the United States. First, although the TVPRA listing does not physically mark goods, it may still create a risk of consumer backlash for instance by causing media coverage focused on child and forced labor involved in the production of goods. This backlash may therefore be stronger for goods that are closer to the point of consumption, for reasons discussed in Section 2.2. We might as a result expect a larger effect of listing for consumption goods than for intermediate products. Thus, I carry out a heterogeneity analysis to test whether the magnitude of the effect is stronger for certain goods than others. Specifically, I interact the listed dummy with whether the concerned good is in one of three stages of production: consumption, intermediate and capital.

The results are presented in Table 11. The estimated coefficient for consumption goods shows that imports into the U.S. decline by about 30% after the TVPRA listing, whereas the result for intermediate goods is not statistically significant. The statistically significant result for consumption goods might be observed due to (1) higher visibility of these products to consumers (e.g. garment from

[44] For example, all commodities starting with 61.

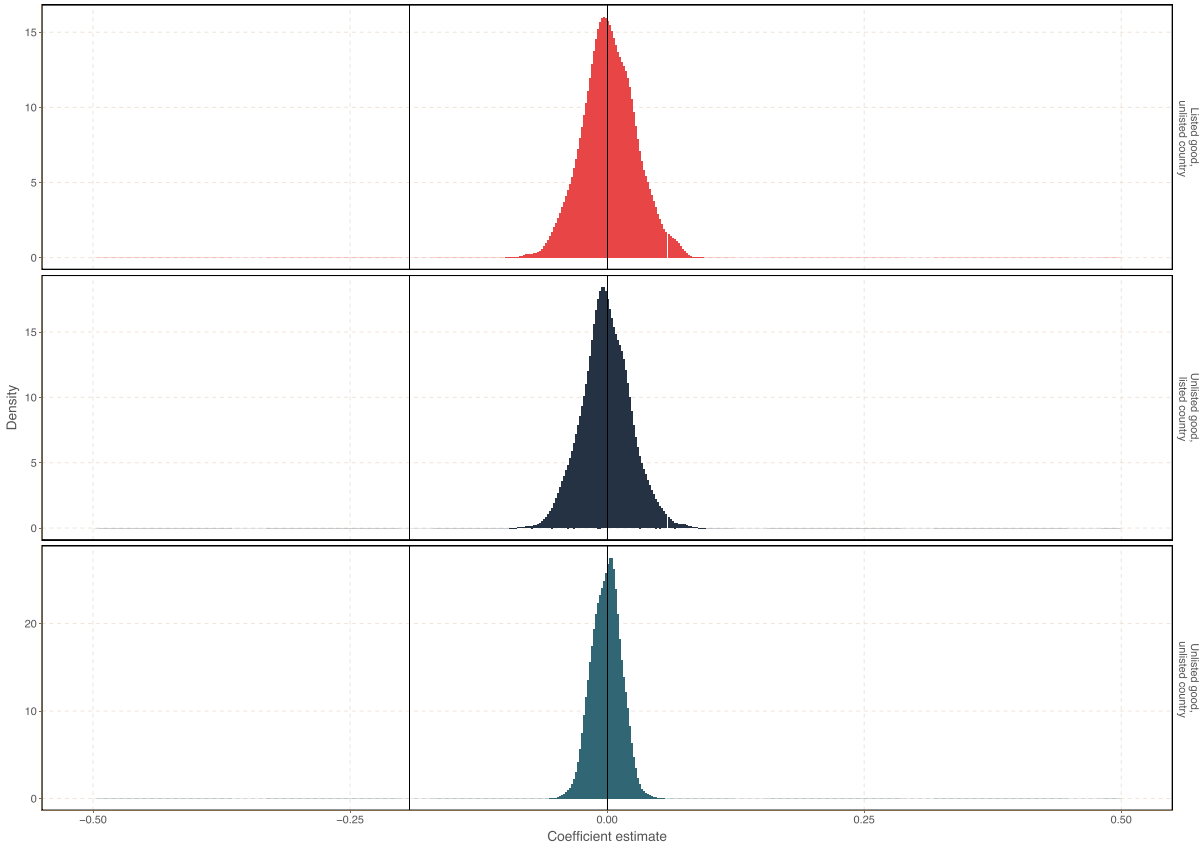


Fig. 3. Placebo test results. Note: The panels show the densities of listing from three placebo tests. The first panel presents the results where the listing is randomly assigned to listed goods from unlisted countries. The second panel shows the density of the listing coefficient for when the listing is randomly allocated to unlisted goods from listed countries. The third density is from randomly assigning listing to unlisted goods from unlisted countries. The vertical line corresponds to the benchmark result of 0.192.

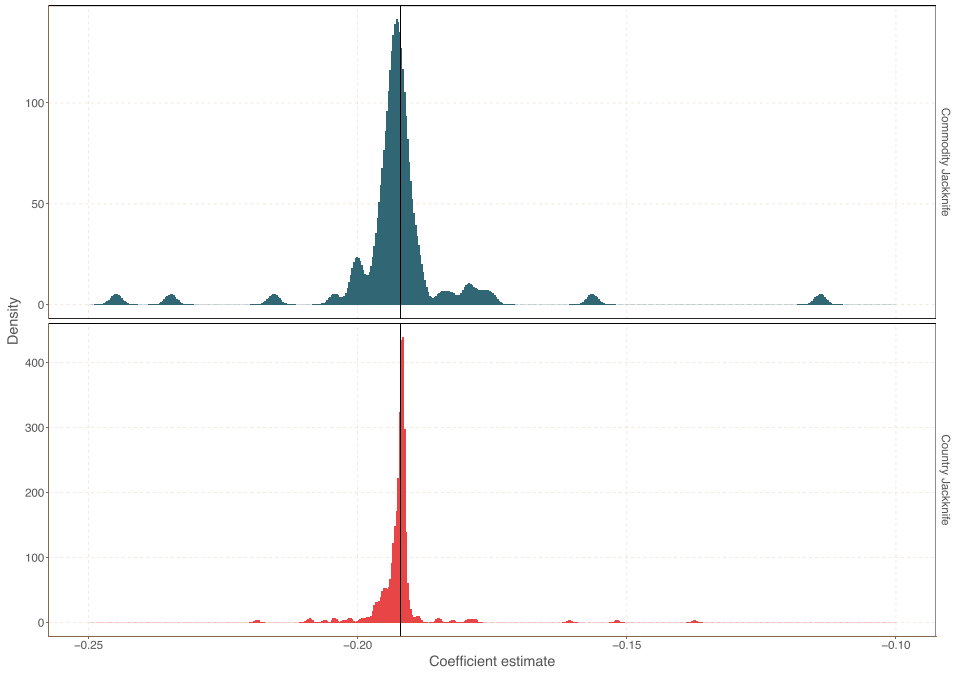


Fig. 4. Jackknife test results. Note: Densities of the listing coefficient from re-running benchmark specification excluding every listed country and two-digit commodities one at a time.

Table 11
Effect of the TVPRA listing by stages of production.

	Dependent variable:	
	IMP	Import Dummy
	(1)	(2)
Listed t-1 × Consumption	−0.363***	−0.030***
	(0.060)	(0.004)
Listed t-1 × Intermediate	−0.034	−0.001
	(0.037)	(0.003)
Listed t-1 × Capital	−0.957***	−0.062***
	(0.363)	(0.021)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Within R^2 are presented.

Table 12
Effect of the TVPRA listing by sectors of production.

	Dependent variable:	
	IMP	Import Dummy
	(1)	(2)
Listed t-1 × Agriculture	−0.018	0.002
	(0.052)	(0.004)
Listed t-1 × Manufacturing	−0.401***	−0.034***
	(0.046)	(0.003)
Listed t-1 × Mining	0.011	−0.003
	(0.108)	(0.007)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Within R^2 are presented.

Bangladesh on the label) and/or (2) firms trying to avoid bad publicity and backlash from consumers by switching suppliers of consumer goods that are TVPRA listed. Thus, the statistically insignificant coefficient for intermediate goods does not rule out importing firms adjusting their behavior, but does corroborate the notion that intermediate goods are characterized by lower visibility of their TVPRA listing to consumers. Indeed, firms may not mention on the labels of their final goods which intermediate goods were used in their production, even if the latter were TVPRA listed. This in turn makes it difficult for consumers to penalize TVPRA listed intermediate goods (and the companies that import them), thereby reducing incentives for firms to switch suppliers of TVPRA listed intermediate goods.

Second, I consider a sectoral decomposition where I interact the listed dummy with whether the concerned good is in one of the following three sectors: agricultural, manufacturing and mining. Table 12 suggests that imports for manufacturing declined by 33% while agriculture and mining goods seem to remain unaffected. This result might partially reflect firms' greater ability to divert supply chains for manufacturing goods, whereas some mining product (e.g. tanzanite) and agriculture products (e.g. yerba mate) might only be sourced from one place.

Third, given the diversity of countries that can appear on the list and their dispersion across the globe (see Fig. 2), I test for which regions were affected the most by listing. Specifically, I use the benchmark specification and interact the regressor of interest Listed with the region of imports origin. These results presented in Table 13 show that TVPRA listing is associated with about 30% decline of U.S. imports from East Asia and Pacific, 27% for the Middle East and North Africa and 30% for Latin America and the Caribbean. Surprisingly, South Asian imports were not affected by the United States. Similarly, imports from Europe and Central Asia, and South Asia were not significantly affected. These regions were mainly listed for intermediate and mining goods, which did not react substantially to the listing.

Fourth, consumers and firms might be more sensitive towards information revelation about a certain type of labor abuses. For example, they can be less likely to buy goods if they were produced by both types of labor, which might imply widespread labor violations in the industry. Conversely, it could be that consumers are especially concerned about child labor being used. To explore these possibilities, Table 14 displays regression results by listing type: whether a country and a good were listed for child labor; forced labor; or for both child and forced of labor. The estimates show

Table 13
Effect of TVPRA listing by region.

	Dependent variable:	
	IMP	Import Dummy
	(1)	(2)
Listed t-1 × East Asia and Pacific	−0.352***	−0.024***
	(0.059)	(0.004)
Listed t-1 × Europe and Central Asia	−0.055	−0.001
	(0.056)	(0.004)
Listed t-1 × Latin America and Caribbean	−0.361***	−0.032***
	(0.106)	(0.007)
Listed t-1 × Middle East and North Africa	−0.312***	−0.030***
	(0.107)	(0.008)
Listed t-1 × South Asia	−0.046	−0.004
	(0.053)	(0.004)
Listed t-1 × Sub-Saharan Africa	0.067*	0.004
	(0.035)	(0.003)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Within R^2 are presented.

there is a statistically significant response to listing when both types of labor abuses are present or when it concerns child labor, but not when it concerns only forced labor. This might be a reflection of greater available knowledge or greater concerns about child labor violations as compared to forced labor. Indeed, there are more ILO articles mentioning child and both types of violations than forced labor usage (e.g. Fig. C.3).

Finally, Table 15 examines whether consumers and firms are more likely to stop buying listed goods if the exporting country is favorably perceived (or not) by United States consumers. To capture consumers' perceptions of listed countries, I rely on responses to a 2017 survey, carried out by the polling company YouGov, which asked 7,150 adults living in the United States how they viewed a subset of 144 countries (YouGov America, 2017). The survey question asked: "Do you consider the countries listed below to be a friend or an enemy of the United States?" and for each country respondents could select one out of five possible answers: (1) "Ally

Table 14
Effect of TVPRA listing by labor type.

	Dependent variable:	
	IMP	Import Dummy
	(1)	(2)
Listed t-1 × Child and Forced Labor	−0.363***	−0.030***
	(0.049)	(0.004)
Listed t-1 × Child Labor	−0.096**	−0.006*
	(0.047)	(0.003)
Listed t-1 × Forced Labor	0.114	0.011
	(0.184)	(0.012)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	26,128,872	26,128,872
R^2	0.795	0.723

Note: Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Constants are not reported. Within R^2 are presented.

Table 15
Regression results by political proximity.

	Dependent variable:	
	IMP	Import Dummy
	(1)	(2)
Listed t-1 × First Quartile	−0.224**	−0.012*
	(0.090)	(0.007)
Listed t-1 × Second Quartile	−0.103**	−0.009**
	(0.050)	(0.004)
Listed t-1 × Third Quartile	−0.070*	−0.012***
	(0.040)	(0.003)
Listed t-1 × Fourth Quartile	−0.176***	−0.009***
	(0.050)	(0.003)
Commodity-Year	Yes	Yes
Commodity-Country	Yes	Yes
Country-Year	Yes	Yes
Observations	15,948,792	15,948,792
R^2	0.800	0.728

Note: Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at a commodity level. In column 1, the dependent variable is the inverse hyperbolic sine transformation of imports and in column 2 it is the dummy variable of imports. All models include a full set of country-year, commodity-year, and commodity-country effects. Constants are not reported. Within R^2 are presented.

of U.S."; (2) "Friendly"; (3) "Not Sure"; (4) "Unfriendly"; or (5) "Enemy of the U.S.". Based on the share of Americans ranking countries in each category, from ally to enemy, I create a categorical variable dividing countries into four quartiles. The categorical variable is then interact with listed dummy. The results shown in Table 15 suggest that all countries are affected. However, allied countries (first quartile) tend to be affected the most by the listing. While the countries that Americans report as allies tend to be richer than most economies, there are also some examples of poorer countries that fit into this group.[45]

Overall, the results show a consistently negative and statistically significant effect of listing on United States imports, but also reveal substantial sectoral, regional, and stages of production heterogeneity.

[45] The most friendly quantile includes countries such as India, Dominican Republic and Brazil. Hence, the effect of an ally being listing is not completely explained by the wealth of the exporting country. Furthermore, in Appendix E I show that findings remain robust if I exclude countries with major political concerns.

8. Conclusion

A number of interventions have been debated as potential policy responses to child and forced labor. Some of these policy responses are relatively direct – for instance, improving access to schooling (Edmonds & Pavcnik, 2005), the enforcement of labor standards (Basu, 2001) and more extreme measure such as trade sanctions (Basu, 2003). Other policy responses instead rely instead on information provisions such as labelling, boycotts and listing. As labelling and boycotts face significant costs and hence are difficult to implement broadly, listing has been suggested as an important and potentially more cost-effective approach to reduce child and forced labor on a large scale.

This paper is the first to investigate the trade effects of a large-scale information provision about goods believed to be produced with child and forced labor. To examine this question, I use the United States Department of Labor's list of goods produced with child and forced labor. The empirical analysis provides robust evidence to support the hypothesis that the provision of information about child and forced labor diminished a country's export prospects with the magnitude of the effect increasing over time. My findings support the concerns raised by several embassies regarding the effect of the TVPRA list on trade. They are also consistent with surveys suggesting that consumers care about the labor standards of goods they purchase. Furthermore, the results are complementary to more recent findings (Hainmueller et al., 2015; Distelhorst & Locke, 2018) suggesting there is indeed a demand for ethically produced goods.[46]

Moreover, the findings also reveal important heterogeneity in the effect of listing across several production and sectoral dimensions. First, the results are driven by consumption goods, which suggests that consumer pressure is key. Second, the effect of listing is only statistically significant for goods produced in the manufacturing sector, while no effect can be observed for agricultural and mining products. This could potentially be due to the manufacturing sector receiving more media mentions regarding violations of labor conditions.[47]

Overall, this paper finds that an information campaign that targets multiple goods and several countries can be effective in reducing exports of these goods to a developed country. The loss of these exports could act as a disincentive for producers and governments that export goods made using child and forced labor. The extent to which this in turn reduces the number of child and forced workers used in production is an area for future research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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[46] Whist this paper presents evidence of the responses to information, these findings do not allow me to comment on whether the list has resulted in any improvements of working conditions of listed countries and goods (e.g. Harrison & Scorse, 2010; Tanaka, 2020)

[47] These findings provide further support for recent work by Thévenon and Edmonds (2019) who argue that in order to combat poverty and promote prosperity, more awareness is needed. To achieve this, countries need to provide reliable information about child labor.

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Appendix A. Supplementary material

Supplementary material associated with this article can be found, in the online version, at: https://doi.org/10.1016/j.worlddev.2023.106217.

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