

DO TRADE AGREEMENTS WITH LABOR
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EXPORTS?

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Abstract

What are the effects of trade agreements with labor provisions on trade? This question has increasingly gained traction due to the growing importance of trade agreements and the proliferation of specific clauses related to labor rights and conditions included in such agreements. So far, the literature has focused on analyzing these effects at an aggregate level, with mixed results. In this paper, we capture heterogeneous effects of trade agreements with labour provisions separating exports by the factor intensity of their production process (labor-intensive vs. non-labor-intensive). Embedding institutional comparative advantage within a gravity framework, we show that, overall, the effects of trade agreements with labor provisions are no different from those of the universe of trade agreements. However, by affecting their comparative advantage, we find that agreements including labor provisions tend to reduce labor-intensive exports from emerging and developing to advanced economies (“South-to-North” exports).

Keywords: international trade, trade agreements, labor provisions, comparative advantages, gravity models.

JEL classification: F13, F14, F16.

Resumen

¿Cuáles son los efectos sobre el comercio de los acuerdos comerciales con disposiciones laborales? Esta pregunta ha ganado fuerza debido a la creciente importancia de los acuerdos comerciales y la proliferación de cláusulas específicas relacionadas con los derechos y condiciones laborales incluidas en dichos acuerdos. Hasta ahora, la literatura se ha centrado en analizar estos efectos a nivel agregado, con resultados contradictorios. En este documento, capturamos los efectos heterogéneos de los acuerdos comerciales con disposiciones laborales separando las exportaciones por la intensidad de utilización de los factores en su proceso de producción (intensivo en mano de obra versus no intensivo en mano de obra). Al incorporar la ventaja comparativa institucional dentro de un modelo de gravedad, mostramos que, en general, los efectos de los acuerdos comerciales con provisiones laborales no son diferentes de los demás acuerdos comerciales. Sin embargo, al afectar a su ventaja comparativa, encontramos que los acuerdos que incluyen disposiciones laborales tienden a reducir las exportaciones intensivas en mano de obra de las economías emergentes y en desarrollo hacia las economías avanzadas (exportaciones “Sur-Norte”).

Palabras clave: comercio internacional, acuerdos comerciales, disposiciones laborales, ventajas comparativas, modelos de gravedad.

Códigos JEL: F13, F14, F16.

1. Introduction

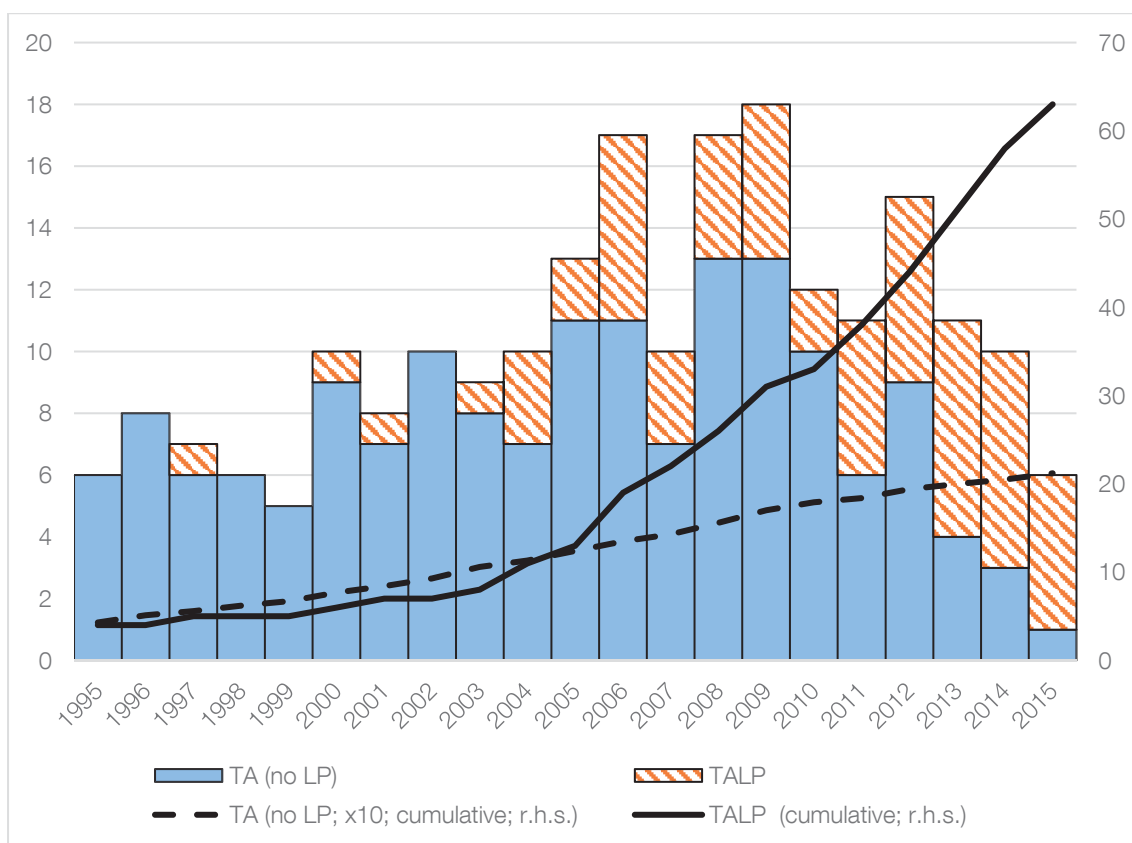
What are the effects of trade agreements with labor provisions on trade? The stronger competition among economies deriving from the rising degree of openness has recently been blamed of surges in unemployment (Autor et al., 2013) and declines in wages (Ashournia et al., 2014), and, more generally, for contributing to a “race to the bottom” in labor standards (Benedek et al., 2007). So far, the empirical literature has suggested that negative labor market outcomes depend on country-specific conditions and institutional factors (Milberg and Winkler, 2011) and a univocal understanding of the relation between trade and labor markets has not yet been reached. While various contributions in the field have studied the effect of trade agreements with labor clauses on trade flows and labor market outcomes, very little is known about the heterogeneity of the effects of such agreements. Considering their increasing application, we investigate the potentially heterogeneous effects of trade agreements with labor provisions on bilateral exports of labor and non-labor intensive products.

This issue is even more relevant as bilateral/regional trade agreements, rather than WTO-wide agreements, have gained importance as instruments for governing the increasing economic integration. Since the 1990s, not only the number of trade agreements signed, but also the number of provisions included in their texts increased very rapidly. Among those, labor provisions, i.e. legal clauses meant to promote labor market and working conditions and reinforce labor rights in the signatory countries,¹ have had quite a prominent role. Indeed, since their debut in the North American Free Trade Agreement (NAFTA), the share of trade agreements with labor provisions has risen from approximately 7% of the total number of trade agreements in 1995 to 24% in 2015. Moreover, almost 50% of the new treaties signed between 2010 and 2015 contained labor clauses in their text (see Figure 1).

In relation to trade agreements with labor provisions, previous contributions fall mostly in two main groups. Part of the literature has focused on analysing the relationship between trade agreements with labor provisions and countries’ labor

¹ This means the inclusion in the treaties of references to both core labor standards and other ILO instruments, as well as mechanisms for enforcement, implementation and cooperation. For instance, in the United States-Mexico-Canada (USMCA) agreement, Chapter 23 (“Labor”), Article 23.3 (“Labor Rights”) Point 2 reads as follows: “Each Party shall adopt and maintain statutes and regulations, and practices thereunder, governing acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health.” See section 3 for a broader description.

Figure 1: Trade agreements with labor provisions, 1995-2015



Note: "TALP" identifies trade agreement with labor provisions. "TA (no LP)" identifies all the rest of trade agreements. Columns represent the number of trade agreements signed in the corresponding year. The line represents the cumulative number of trade agreements with labor provisions in force. "TA (no LP)" cumulative should be multiplied by ten to obtain the number of "TA (no LP)" in force. The year represents the year of entry into force.

Source: Authors' elaboration on WTO RTA and Horizontal Depth database.

standards or other labor market conditions (such as minimum wage, unemployment benefits, etc., e.g. Kamata, 2014; Kamata, 2015; and Martinez-Zarzoso and Kruse, 2019). Most studies show mixed results, with trade agreements with labor provisions influencing only certain indicators of labor market and working condition indicators (e.g. minimum wage, unemployment rate, composite/proxy measures of labor rights).² However, one major challenge these studies face³ is the dimension of the informal sector,⁴ particularly in those countries where labor standards are supposedly lower (and therefore have more room for improvements), such as emerging and developing

² These measures are often inserted in the regression framework as the existing gap between trade partners.

³ Beside the inherent difficulties in quantifying labor rights and standards.

⁴ ILO defines informal employment as follows: "own-account workers outside the formal sector, contributing family workers, employers and members of producers' cooperatives in the informal sector, and employees without formal contracts". For further details please see the dedicated section of the ILO website (<https://ilostat.ilo.org/topics/informality/>)

economies.⁵ Indeed, all such indicators provide information on the formal side of the economy, and this can represent a fraction of the labor market as small as 1%: ILO estimates show that, in emerging and developing economies, between 20% and 99% of total employment is informal.

Another, wider, strand of the literature focused on the effect of labor standards and provisions on comparative advantages and trade flows. Traditional trade theory states that trade liberalization would induce countries to specialize in the production of goods in which they enjoy a comparative advantage. This advantage could emerge, mainly, from differences in both the relative factor endowments (*a la* Heckscher-Ohlin) and the institutional and regulatory frameworks (Nunn and Trefler, 2014; Baghdadi et al., 2013). Against this backdrop, labor standards are expected to affect the comparative advantage and the ability of exporting through different channels, linked both to production costs and productivity, and to foreign demand.

From a supply-side perspective, the inclusion of labor clauses in a trade agreement may increase the cost of labor to comply with higher standards (cost channel), reducing the comparative advantage of a country (Busse, 2002; Nunn and Trefler, 2014). Nevertheless, this channel may be counteracted by the productivity channel: numerous studies (e.g. OECD, 2013; ILO, 2017) associate compliance with labor standards to higher labor productivity by the means of a variety of factors, ranging from higher worker satisfaction to lower rate of accidents at work. In the same fashion, higher standards could promote innovation and stimulate training and investment in human capital by firms, as well as enhance their governance.

Foreign demand may also change in parallel to shift in domestic labor conditions, as far as consumers and firms from importing economies are concerned with human and worker conditions in exporting economies.⁶ The inclusion of labor clauses in a trade agreement can thus boost trade by means of either more sophisticated global value chains (GVCs) linkages (Osnago et al., 2016)⁷ or direct business-to-consumer

⁵ Following the literature (e.g. Melitz, 2003; Anson et al., 2005; Montout and Zitouna, 2005; UNCTAD, 2006; Aleksynska and Havrylchyk, 2013; Vicard, 2013; Disdier et al., 2015), we use interchangeably the terms “emerging and developing economies” and “the South”, as well as “advanced economies” and “the North”. Again in line with the literature, we include in the “North” those economies that are classified as high-income OECD countries, while we classify in the “South” category all other countries.

⁶ In this context, the use of labelling has also been proposed by some authors (e.g. Freeman, 1994) as an alternative market-based solution to improve labor standards internationally as it allows consumers to buy standards paying a higher price (and compensating producers for the higher cost).

⁷ For a theoretical discussion on GVCs and free trade agreements, see Antràs and Stager (2012).

relationships. These effects are strongly emphasized in Carrère et al. (2017).⁸ Additionally, to the extent that higher labor standards in exporting countries may induce an increase of labor incomes/wages, i.e. expand the local aggregate demand, trade agreements with labor provisions may divert trade away from exports to the internal market (i.e. domestic sales, e.g. Yotov, 2012; Dai et al., 2014; and Larch et al., 2018). Previous research (e.g. Busse, 2002; Busse and Braun, 2004; Kucera and Sarna, 2006) has shown empirically that a change in nation-wide labor standards have heterogeneous effects on the trade performance of a country. As an example, Busse (2002) finds that forced and child labor increase the endowment of labor, and therefore affect country exports by reinforcing their comparative advantage. The reasons why labor standards are expected to have larger impacts on labor-intensive products are mainly two: i) labor is the factor that is likely to be directly affected by labor standards, with larger effects accruing to more labor-intensive products; ii) as labor-intensive products are often associated with low-skill workers, the low-skill segment of the labor force is likely the most affected by labor standard policy (Basu et al., 2008). In addition, “South-to-North” trade flows may be especially exposed to differential effects as economies in the “South” tend to have lower labor standards and large differences exist among trade partners’ regulations and provisions.

However, so far, the literature that focused on understanding the effects of trade agreements with labor provisions on trade flows has so far provided only mixed evidence. ILO (2016) find no difference between the (positive) impact of a trade agreement without and with labor provisions on exports, as well as no differential effects for “South-to-North” exports. Carrère et al. (2017) instead, using a sample limited to those exporter-importer pairs that signed a trade agreement (independently of this being with or without labor provisions), show that are exactly “South-to-North” exports that benefit the most from trade agreements with labor provisions. In contrast, Kamata (2014) argues that trade agreements with labor provisions have smaller effects, if any, on “South-to-North” exports (with respect to a trade agreement without labor provisions). Notwithstanding possible differences in the sample and methodology, a prominent reason for these discrepancies may indeed be that most of the studies use

⁸ Using highly disaggregated trade data (HS 6 digit), Nicita and Murina (2017) and Timini and Conesa (2018) provide additional evidence in the direction of the possible existence of such channel for the specific case of sanitary and phytosanitary (SPS) measures.

highly aggregated data, i.e. total (bilateral) trade flows. Such approach, however, is likely to hide important heterogeneous effects as trade agreements with labor provisions would especially affect exports of labor-intensive products rather than total exports.

This paper aims at shedding some light on the potentially heterogeneous effects of trade agreements with labor provisions on bilateral exports using trade data separated by the factor intensity of their production process (labor-intensive vs. non-labor-intensive). To the best of our knowledge, our paper is the first study providing this type of “disaggregated” analysis. As mentioned in the previous paragraph, our hypothesis is that we can expect trade agreements with labor provisions to directly affect labor-intensive, rather than non-labor-intensive (i.e. capital- and technology-intensive) goods. In parallel, and in line with other studies, we will check if “South-to-North” exports have a differential effect, as labor standards of countries in the “South” are supposedly lower, and therefore may experience larger changes as a consequences of a trade agreement with labor provisions.

To this end, we estimate an augmented gravity model, including a full set of fixed effects in line with the most recent developments in the literature and using a poisson pseudo-maximum likelihood estimating procedure. In this way, we are able to limit our concerns about some well-known empirical issues in gravity models, especially the presence of heteroscedasticity and zero trade-flows values. Our results show that trade agreements without and with labor provisions have similar effects on trade, and tend to promote “South-to-North” overall exports. However, trade agreements with labor provisions curb the institutional comparative advantage of labor abundant countries, an effect similar in nature to that of having higher labor standards. In other words, by affecting their comparative advantage, agreements including labor provisions tend to reduce labor-intensive exports from emerging and developing to advanced economies (“South-to-North” exports). Our results prove to be solid to a number of robustness tests.

Our study contributes to two different strands of the literature. First, by focusing on the effect of trade agreement with labor clauses on export flows, our paper complements the research dedicated to the “new generation” of trade agreements and their heterogeneous effects on trade flows (e.g. Kohl et al., 2016; Baier et al., 2019; Brandi et al., 2020). Second, by explicitly structuring the analysis within a cross-country comparative advantage framework, our paper adds to the literature investigating how

these are shaped by domestic and international institutions (Nunn, 2007; Nunn and Trefler, 2014).

The rest of the paper is organized as follows: Section 2 provides a brief summary on the state of the literature on gravity models. Section 3 portrays the relevance of labor issues in the trade policy agenda and describes in more details labor provisions included in trade agreements. Section 4 discusses the empirical strategy and the data used. Section 5 presents the results and the robustness tests, and Section 6 concludes.

2. Gravity models: a literature review

Since the early contribution of Tinbergen (1962), gravity models have been used in international trade to assess the effects of trade agreements on trade flows. In essence, gravity models provide a theoretical and empirical framework that link bilateral (origin-destination) trade flows to their economic mass and distance, as well as trade policy. Baldwin and Taglioni (2007) and Yotov et al. (2016) offer detailed analysis on the methodological aspects of gravity models.⁹ Here, we highlight the most important issues that justify our empirical approach. First, the inclusion of “multilateral trade resistances” (MTRs): Anderson and van Wincoop (2003)¹⁰ demonstrate that bilateral exports and imports depend, respectively, on trade costs across all export and import markets, and that these should be taken into account in the empirical specification by the means of exporter-time and importer-time fixed effects. Second, the need of dealing with trade policy endogeneity: countries that trade more among them may be more likely to implement a trade agreement. To this extent, Baier and Bergstrand (2007) offer a straightforward solution: using panel (instead of cross-section) data and including country-pair (i.e. importer-exporter) fixed effects. Yotov et al. (2016) indicate a further test for strict(er) exogeneity: incorporating lead indicators of trade agreements (trade agreements are usually included by a dichotomic dummy) that, in absence of reverse causality, should not be statistically significant. We will implement these supplementary tests in the robustness section. Third, in line with e.g. Tang (2012) and Blyde and Molina (2015), it is possible to extend the gravity framework further, to directly incorporate institutional comparative advantages. It is done by using a gravity model with “sector”

⁹ The same methodology has also been applied to estimate the effect of exchange rate arrangements (e.g. monetary unions) on bilateral trade. For more details, see Gil-Pareja et al. (2008); Glick and Rose (2016).

¹⁰ Anderson (1979) previously established the theoretical foundations of the “economic gravity”.

data, so to exploit both sector and country-level information to construct factor endowment proxies.

In this context, we therefore implement a state of the art gravity model to assess the effect of trade agreements with labor provisions on exports flows. Our contribution is to use export flows separated by the factor intensity of their production process (labor-intensive vs. non-labor-intensive) and to explicitly consider institutional sources of comparative advantage, something that so far the literature had not taken into account. In this way, we make possible to empirically test for heterogeneous effects.

3. Labor standards and labor provisions in the international trade policy agenda

Despite the general acceptance of fundamental rights and principles related to labor,¹¹ their actual application widely differ across countries. To achieve and maintain an (internationally) acceptable level of labor standards, one of the most common strategies has been inclusion of labor provisions in trade agreements.¹²

In this context, a labor provision refers to any clause included in the treaty text meant to protect and/or promote labor standards in the signatory countries (Carrere et al., 2017). Their incorporation into the agreements is usually done through specific “social” or “labor” chapters (as in the USMCA agreement) or even side-agreements (as in the NAFTA agreement). Typically, such provisions establish minimum standards of working conditions and labor rights as well as procedures and mechanisms for enforcement, monitoring and cooperation.

Labor provisions included in trade agreements are diverse in nature, as they comprise a broad range of obligations and references, in particular to ILO instruments such as declarations, conventions, recommendations or protocols (ILO, 2017). Many agreements include not only the list of ILO’s fundamental principles and rights, but also commitments regarding minimum wages or working hours, health and safety conditions at work, non-discrimination (due to gender, age or race), or protection to migrant workers.

¹¹ Multilateral organizations —such as the ILO— endorse universal principles ratified by its member countries to promote the establishment of labor standards as fundamental rights. The four core labor standards protected include: (i) freedom of association and the right to collective bargaining; (ii) elimination of all forms of forced or compulsory labor; (iii) effective abolition of child labor; and (iv) elimination of discrimination in respect of employment and occupation (ILO, 2017)

¹² For a deeper discussion on the debate concerning the inclusion of labor provisions in trade agreements, particularly from a political economy perspective, see Summers, 2001; Stern, 2003; Salem and Rozental, 2012; ILO, 2016; and ILO, 2017.

Part of the provisions also cover the enforcement mechanisms to ensure effective implementation of labor standards (for instance, imposing sanctions), to promote cooperation between signatory countries, to monitor compliance and to solve disputes in case of conflict (through arbitration and dispute settlement mechanisms). The level and quality of enforcement of those commitments is critical in directly influencing working conditions in signatory countries (Hafner-Burton, 2005).

4. Methodology and data

4.1. Data

Trade data are from the Observatory of Economic Complexity database.¹³ This new database created by the MIT Media Lab Macro Connections Group¹⁴ put together trade data from the most reliable primary and secondary sources, namely: UN COMTRADE and Feenstra et al. (2005). The database provides standardized information at the finest internationally comparable level of product information (filled using standard mirroring techniques)¹⁵. We use SITC 3-digit classification and limit our analysis to manufacturing products in order to classify export products by the factor intensity of their production process (labor-intensive vs. non-labor-intensive products) using a compatible taxonomy. Data on trade agreements (existence and classification) are from the WTO RTA Database and World Bank Horizontal Depth Database (Hofmann et al., 2017), which provides detailed information on the content of bilateral/regional agreements, including the coverage of labor provisions. To account for the depth, i.e. a measure of “comprehensiveness” – in terms of clauses and provisions – of each agreement we include the ready-to-use measure provided in the DESTA database. To align our results with the previous literature, we use the data on factor intensity of manufactured goods provided by Busse (2002) and Busse and Braun (2004), in turn based on OECD (2001) (see Table A.1 in Appendix for more details). However, in the

¹³ We limit our analysis to manufacturing trade for the following reasons: to have a wide and complete coverage of country-level data; to ensure comparability with similar studies (e.g. Busse, 2002; Busse and Braun, 2004); to cope with the lack of information on the labor intensity of agricultural production (both across SITC 3 digit categories within the agricultural sector, and between agriculture and manufacturing). Trade in services is often treated separately due to their different nature. For an in-depth analysis, see Anderson et al. (2018).

¹⁴ For more information, please visit: <https://oec.world/en/resources/about/>

¹⁵ This means exploiting the fact that exports from country a to country b correspond to imports of country b from country a, and vice versa, see Timini (2018) for a longer description and application of the method to historical data.

robustness analysis, we use an alternative classification elaborated by UNCTAD. Labor and capital country-level data are from Penn World Tables. Data on labor standards (e.g. ILO conventions ratified) are from the ILO website. Standard gravity variables are from CEPII database.

As our focus in this work is on the differential effects of labor provisions on labor-intensive and non-labor-intensive manufactured goods, we aggregate export flows within these two categories for each country-pair and year. In this way the database provides enough level of detail for correctly performing our analysis, without making it computationally unfeasible. In our final database, the sample includes 195 countries (a complete list is reported in Table A.2 in the Appendix), whose exports in labor-intensive and non labor-intensive goods are observed over the period 1995-2015. Summary statistics are reported in Table A.3 in the Appendix.

4.2. Empirical strategy

We follow Anderson and van Wincoop (2003), Baier and Bergstrand (2007) and Head and Mayer (2013) in implementing an augmented gravity model, which explains bilateral trade flows by transaction costs and economic size, and controls for multilateral trade resistances (MTRs) and endogeneity issues. Additionally, as in Romalis (2004), Nunn (2007), and Blyde and Molina (2015), we also explicitly consider (institutional) comparative advantage, by including a series of interactions between country and sector-level variables.

To properly address zero-inflated data and heteroscedasticity, two features typical of trade data, we use the methodology proposed by Santos Silva and Tenreyro (2006), i.e. a poisson pseudo-maximum likelihood estimating procedure. The main specification can be written as follows:

$$\begin{aligned}
 X_{ijst} = \exp(\beta_0 + \beta_1 CA_{bil_{ijt}} + \beta_2 CA_{ILO_{ijt}} + \beta_3 CA_{ILO_LI_{ijst}} + \beta_4 TA_{ijt} \\
 + \beta_5 CA_{ILO_LI_TA_{ijst}} + \beta_6 TALP_{ijt} + \beta_7 CA_{ILO_LI_TALP_{ijst}} \\
 + \beta_8 Depth_{ijt} + \delta_{it} + \gamma_{jt} + \rho_{st} + \omega_{ij}) + \varepsilon_{ijst}
 \end{aligned} \tag{1}$$

where X_{ijst} are manufactured exports of country i to country j of sector s (s = labor-intensive, non-labor-intensive) at time t (see Table A.4 in Appendix for a more detailed definition of all the variables and their sources). $CA_{bil_{ijt}}$ represents the relative comparative advantage between the exporter (i) and the importer (j). It identifies

relative labor abundance, and it is defined as the ratio between the exporter and importer labor to capital ratio. CA_ILO_{ijt} is the interaction between our indicator of labor abundance (CA_bil_{ijt}) and a proxy for exporter labor standards (ILO_exp_{it}), as more lax standards may magnify labor endowment. In the spirit of Busse (2002), ILO_exp_{it} is defined as the rescaled (between 0-10) number of ratified ILO conventions on core labor standards (these are eight in total). We then include $CA_ILO_LI_{ijst}$. This is an interaction between the previous variable CA_ILO_{ijt} and a dichotomous indicator (LI_s) of labor intensity. In other words, we can capture the difference in the joint effect of labor abundance and ILO labor standards for labor-intensive and non labor-intensive products. This approach allows us to explore the role of “institutional comparative advantage” as in Nunn and Trefler (2014): low standards may particularly benefit labor-intensive industries in labor abundant countries.

To investigate how trade policy intervenes in the relations among comparative advantage, labor intensity and labor standards, we proceed as follows. First, we include two variables capturing the universe of trade agreements in our sample: TA_{ijt} is a dummy variable and it is equal to 1 when countries i and j have a bilateral/regional trade agreement in force at time t, and zero otherwise. $TALP_{ijt}$ is a dummy variable and it is equal to 1 when countries i and j have a bilateral/regional trade agreement with labor provisions in force at time t, and zero otherwise. As, by construction, labor provisions can be present ($TALP_{ijt} = 1$) only when an agreement is in place ($TA_{ijt} = 1$), $TALP_{ijt}$ measures the differential effect of trade agreements with labor provisions with respect to trade agreements without labor provisions.

The next step is to combine the TA and $TALP$ variables with the “institutional comparative advantage” framework. This is done by the inclusion of two additional interaction terms: $CA_ILO_LI_{ijst} * TA_{ijt}$ and $CA_ILO_LI_{ijst} * TALP_{ijt}$. We would expect, for the reasons listed above, the treatment effect of trade agreements with labor provisions to be relevant only for South-to-North exports, i.e. for exports from economies with relatively low labor standards (emerging and developing) to economies with relatively high labor standards (advanced).

Following the literature that deals with particular features of trade agreements (see Dür et al, 2014, for a general review, Carrère et al., 2017, for labor provisions; or Brandi et al., 2020, for environmental provisions), we explicitly take into account the existence in

trade agreements of chapters other than that of labor provisions. These are captured by the inclusion of $Depth_{ijt}$, an additive index combining what Dür et al. (2014) define as “seven key provisions that can be included” in a trade agreement. Importantly, these areas do not include labor market policies and instead focus on: tariffs (reduction to zero of all tariffs with certain, limited, exceptions); trade in services; investment; standards (such as sanitary and phytosanitary [SPS] measures or technical barriers to trade [TBT]); public procurement; competition policy and intellectual property rights.

Finally, in our main specification, we include exporter time (δ_{it}), importer-time (γ_{jt}), country-pair (ω_{ij}), and sector-time (ρ_{st}) fixed effects. We will further saturate the model with additional fixed effects (e.g. country-pair-time) in a set of alternative regressions. Concerning standard errors, we follow the advice of Egger and Tarlea (2015) in using a three-way clustering. As we cluster the standard errors for importer-time, exporter-time and country-pairs, we make our estimates relatively more conservative.¹⁶

As a final remark, while this approach has been widely used in the literature – for example Rajan and Zingales (1998) interacted country-level with industry-level variables to tackle endogeneity issues (in development and finance), and Romalis (2004) applied a very similar analytical framework in the international trade field – we should recognize (following the considerations also reported by Blyde and Molina, 2015) that in our case, despite using panel (rather than cross-section) data, we cannot completely rule out the possibility of reverse causality, as our interacted “institutional” comparative advantage factor, the inclusion of labor provisions in a trade agreement, is a matter of policy choice. Nevertheless, this problem is common to the literature that deals with the effects of trade agreements (whether the universe of trade agreements or a particular subsection). Additionally, the use of “sectoral” data and the combination of fixed effects used both in the main regression and the robustness tests, ensures that, empirically, we deal with this issue in the best possible way.

5. Results

The results for the whole sample (i.e. not separated between the “North” and the “South”) from the augmented gravity model with poisson pseudo-maximum likelihood estimates, are presented in Table 1. We begin (in Column 1) with the simplest form of

¹⁶ Our main results are robust to alternative three-way clustering such as importer, exporter and year, as in Baier et al. (2019), and to the “classic” country-pairs clustering.

the gravity equation, and we then proceed saturating the model sequentially with additional fixed effects and variables of interest.

First, we show the basic specification(s) with importer-time, exporter-time and sector-time fixed effects (Columns 1 to 4). Instead of country-pair fixed effects (ω_{ij}), we include the standard gravity-type variables used to capture time-invariant bilateral trade costs: (the logarithm of) distance ("*ln(dist)*"), whether or not trade partners share a common border ("*contig*") and language ("*com_lang*"), and if they ever experience a colonial relationship ("*colony*"). In this way we provide a "first check" showing that in our sample the "standard gravity" is working. Indeed, *ln(dist)*, *contig* and *com_lang* enter the regressions with the expected sign: *ceteris paribus* a) the farther apart the trade partners are, the less they trade between them; b) if two trade partners share a border or a language, they will trade more. While the *colony* coefficient is something more debated in the literature,¹⁷ in our case is line with most studies using the poisson pseudo-maximum likelihood as a method of estimations (e.g. Santos Silva and Tenreyro, 2006; Fally, 2015): it is positive, but not significantly different from zero.

The variable capturing the difference in comparative advantage, *CA_bil*, is positive and significant, meaning that the wider the difference between exporter and importer endowment, the more they trade between them.

The dummy identifying *TA* is positive and significant, whereas *TALP* is not. Recalling that *TALP* identifies eventual deviation from the TA average effect, this means that we find a positive relationship between trade agreements and trade flows in both cases (*TA* and *TALP*), and that *TA* and *TALP* effects are not different between them. The entry into force of a trade agreement is associated with an increase in trade of around 50%. As we will see later on, the variable turns insignificant when controlling for country-pair fixed effects so we cannot completely rule out the possibility that this positive relationship is driven by endogeneity in the full sample.

Depth, the indicator summarizing the other chapters, clauses and provisions included in the trade agreement, is not significant, meaning that – on average – these clauses do not have relevant effects on trade once the above mentioned factors are taken into account.

¹⁷ In the literature various studies also separate between pair of countries that ever were in colonial relationship, existing and former colonial relationships. Here we do not do so as it is not the purpose of our paper, and we are only discussing our basic specification, whereas in our main specification the variable is absorbed by pair fixed effects.

Table 1: Institutional comparative advantage and TA with labor provisions, full sample

Variables	Basic specification (1)	Basic specification (2)	Basic specification (3)	Basic specification (4)	Main specification (5)
ln(dist)	-0.740*** (0.0327)	-0.740*** (0.0327)	-0.746*** (0.0329)	-0.746*** (0.0329)	
contig	0.363*** (0.0694)	0.363*** (0.0691)	0.351*** (0.0704)	0.351*** (0.0704)	
colony	0.145 (0.0997)	0.145 (0.0997)	0.139 (0.101)	0.140 (0.102)	
com_lang	0.169*** (0.0654)	0.169*** (0.0652)	0.175*** (0.0662)	0.174*** (0.0665)	
CA_bil	0.0294*** (0.00695)	0.0489*** (0.0149)	0.0704*** (0.0184)	0.0703*** (0.0183)	0.0328** (0.0132)
CA_ILO		-0.0322* (0.0166)	-0.155*** (0.0360)	-0.156*** (0.0365)	-0.139*** (0.0430)
CA_ILO_LI			0.149*** (0.0285)	0.151*** (0.0299)	0.177*** (0.0336)
TA	0.434*** (0.0941)	0.431*** (0.0938)	0.408*** (0.0919)	0.414*** (0.0921)	-0.120 (0.113)
CA_ILO_LI_TA				-0.0205 (0.0234)	-0.0321 (0.0288)
TALP	0.0586 (0.0852)	0.0630 (0.0853)	0.0510 (0.0850)	0.0538 (0.0852)	-0.00311 (0.0558)
CA_ILO_LI_TALP				-0.0386 (0.0697)	-0.0328 (0.0637)
Depth	0.00188 (0.0199)	0.00196 (0.0198)	0.00640 (0.0197)	0.00607 (0.0197)	0.00923 (0.0103)
Observations	909,526	909,526	909,526	909,526	909,526
Exp-time & imp-time FEs	YES	YES	YES	YES	YES
Country-pair FEs	NO	NO	NO	NO	YES
Sector-time FEs	YES	YES	YES	YES	YES

Note: Poisson regressions. Dependent variable: Bilateral exports, sector level (sector = labor-intensive ; non-labor-intensive). Fixed effects and constants not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the importer-time, exporter-time and country-pair level.

***p < 0.01, **p < 0.05, *p < 0.1

In Column 2 we introduce the interaction between differences in “endowment” and labor standards. In line with Busse (2002), we find that low labor standards reinforce the comparative advantage of labor abundant countries (i.e. the *CA_ILO* negative coefficient indicates that higher labor standards curb the CA of labor abundant countries).

In Column 3 we introduce the interaction of labor abundance, labor intensity of industry and labor standards. Its positive coefficient indicates that low standards particularly benefit labor-intensive industries in labor abundant countries. This empirical result is in line with the intuition of “institutional comparative advantage” (Nunn and Trefler, 2014).

In Column 4 and 5, we include the interaction of the latter variable (*CA_ILO_LI*) with trade agreements and trade agreements with labor standards. Both variables are not statistically significant from zero, therefore implying that in the full sample trade agreement without and with labor provisions do not affect the institutional comparative advantage. Overall, trade agreements with labor provisions do not have any differential effects (with respect to whole set of trade agreements).

Nevertheless, as trade agreements with labor provisions are substitutes for lax labor standards (or a lax enforcement of labor standards) in exporting countries, we would expect the treatment effect of TA with labor provisions to be relevant only for this type of countries. We therefore proceed to test this hypothesis reducing the sample to “South-to-North” exports. Table 2 reports the result of our second set of regressions, focusing on the aforementioned subsample. Before getting to the discussion of our main variable of interest, there are a few changes and similarities worth noting. *Com_lang* is now not significantly different from zero. Perhaps, this may be due to the nature of our reduced sample (exporters in the “South” and importers in the “North”), that increase its correlation with the variable *colony*. The comparative advantage effects are now particularly concentrated on labor-intensive products and, in our main specification (Column 5) as well as in all robustness tests, low labor standards act – as in the full sample – as a reinforcement mechanism for the comparative advantage of labor abundant countries. In line with what we show for the full sample, in the case of “South-to-North” exports, trade agreements have a positive and significant effect on exports, which is not statistically different from that of trade agreement with labor provisions. In this case, these results are also robust to properly controlling for the endogeneity of trade agreements as in Baier and Bergstrand (2007), i.e. to the inclusion of country-pair fixed effects (Column 5).

Finally, and more importantly for the focus of this paper, we notice that the coefficient of the interaction of *CA_ILO_LI* with *TALP* is now negative and significant, whereas the coefficient of the interaction of *CA_ILO_LI* with *TA* is not. This means that for “South-to-North” exports, trade agreements with labor provisions curb the comparative advantage of labor abundant countries, an effect similar in nature to that of having higher labor standards (i.e. *CA_ILO*). This effect is robust to the inclusion of country-pair-time fixed effects to the main specification (Column 6). These results are largely in line with the findings of other papers investigating the consequences of the “new generation” of

trade agreements on South-North trade relationships, such as Disdier et al. (2015) for standard harmonization and Anson et al. (2005) for the rules of origins. The authors of the two paper find that the non-tariff barriers contained in the “new generation” agreements act as a brake to trade expansion, partially or totally undoing traditional trade promoting effects.

Table 2: Institutional comparative advantage and TA with labor provisions, “South-to-North”

Variables	Basic specification (1)	Basic specification (2)	Basic specification (3)	Basic specification (4)	Main specification (5)	Main + country-pair-time FEs (6)
ln(dist)	-1.007*** (0.0882)	-1.005*** (0.0883)	-1.007*** (0.0884)	-1.011*** (0.0887)		
contig	0.472*** (0.172)	0.473*** (0.173)	0.469*** (0.173)	0.467*** (0.173)		
colony	0.0375 (0.111)	0.0398 (0.111)	0.0424 (0.112)	0.0425 (0.112)		
com_lang	-0.0112 (0.121)	-0.0134 (0.121)	-0.0165 (0.122)	-0.0242 (0.123)		
CA_bil	0.0350*** (0.0109)	-0.00983 (0.0217)	0.00334 (0.0227)	0.00176 (0.0226)	0.0231 (0.0197)	
CA_ILO		0.0681** (0.0267)	-0.0438 (0.0434)	-0.0419 (0.0442)	-0.120*** (0.0357)	
CA_ILO_LI			0.115*** (0.0302)	0.113*** (0.0305)	0.116*** (0.0308)	0.117*** (0.0312)
TA	0.816*** (0.156)	0.824*** (0.157)	0.822*** (0.158)	0.827*** (0.164)	0.167* (0.0903)	
CA_ILO_LI_TA				-0.00628 (0.0199)	0.00454 (0.0289)	0.00568 (0.0342)
TALP	0.157 (0.165)	0.155 (0.165)	0.159 (0.166)	0.219 (0.172)	0.0507 (0.0976)	
CA_ILO_LI_TALP				-0.168* (0.102)	-0.185* (0.0976)	-0.188* (0.0974)
Depth	-0.0498* (0.0299)	-0.0506* (0.0301)	-0.0522* (0.0303)	-0.0531* (0.0304)	-0.0170 (0.0137)	
Observations	145,386	145,386	145,386	145,386	144,818	133,556
Exp-time & imp-time FEs	YES	YES	YES	YES	YES	YES
Country-pair FEs	NO	NO	NO	NO	YES	YES (CP-time)
Sector-time FEs	YES	YES	YES	YES	YES	YES

Note: Poisson regressions. Dependent variable: Bilateral exports, sector level (sector = labor-intensive ; non-labor-intensive). Fixed effects and constants not reported for the sake of simplicity. CP-time = country-pair-time fixed effects. Standard errors (in parentheses) are clustered at the importer-time, exporter-time and country-pair level. Sample includes exporters in the “South” and importers of the “North”.

***p < 0.01, **p < 0.05, *p < 0.1

Robustness tests

To check the robustness of our results, we consider a set of alternative specifications in Table 3. First, in Column 1, we focus on the endogeneity of trade agreements (overall). We therefore perform the strict(er) exogeneity test suggested by Wooldridge (2010) and Yotov et al. (2016), and performed in several papers using gravity regressions (see, for example, Esteve-Pérez et al., 2020; and El Dahrawy Sánchez-Albornoz and Timini, 2020). To conduct this test, we insert the lead of the trade agreement dummies (*TA* and *TALP*). In absence of reverse causality (in other words, if the trade agreement variables are strictly exogenous), the lead should be not statistically different from zero. This is the case for both *TA* and *TALP*. Therefore, we can conclude that the regression passes the strict(er) exogeneity test.

Second, we deal with another possible confounding factor, specific to *TALP*. We mentioned before that the inclusion of labor provisions in a trade agreement is a matter of policy choice exerted by two countries. Taking into account that we are focusing on North-South relationships, our concern is that government in importing countries may add labor provisions to a trade agreement when their labor-intensive industries are underperforming. To tackle this problem, in Column 2a (main specification) and 2b (main + country-pair-time fixed effects), we substitute importer-time for importer-sector-time fixed effects in our main regressions.

Third, we control for the “depth” of the trade agreements also with respect to the “institutional comparative advantage”, i.e. we interact the variable *CA_ILO_LI* with *Depth*. In this way, we allow the depth of a trade agreement not only to affect trade directly, but also through changing the “institutional comparative advantage”. Related results are reported in column 3a (main specification) and 3b (main + country-pair-time fixed effects): the interaction it is not significantly different from zero in both cases.

Fourth, we test whether our results are robust to a different classification of labor-intensive and non-labor-intensive goods. Most studies dealing with labor standards and trade follow Busse (2002) and Busse and Braun (2004) classification (in turn based on previous OECD work), as the list is specifically oriented to identify labor-intensive goods. This is the classification we adopted in our main specification. Nevertheless, UNCTAD also developed an alternative classification of labor (and resource) intensive manufacturing goods. While the list of sectors included is analogous, the composition of

goods included has some discrepancies. Main differences consist in the latter (UNCTAD) not including “Games, toys, baby carriages, and sporting goods” (SITC 3 digit: 894) among labor-intensive goods, whereas the former (OECD-Busse) excludes construction materials (SITC 3 digit: 661-663) and leather, cork, and wood manufactured products (SITC 3 digit: 611-613; 633-634; 641-642). To implement our robustness check, we therefore use the UNCTAD classification of labor-intensive manufactured goods to compute labor-intensive and non-labor-intensive export flows, i.e. the left hand side of equation (1). Columns 4a (main specification) and 4b (main + country-pair-time fixed effects) report these results. Our main finding, i.e. agreements including labor provisions tend to reduce labor-intensive exports from emerging and developing to advanced economies (“South-to-North” exports), is confirmed as the coefficient of the “institutional comparative advantage” induced by trade agreements with labor provisions remain negative and significant throughout all robustness tests.

Table 3: Robustness tests, South-to-North exports

Variables	TA: Strict(er) exogeneity test (1)	With importer-sector- time FEs (2a)	2a + country-pair-time FEs (2b)	Inst. comp. adv. interacted with "Depth" (3a)	3a + country-pair- time FEs (3b)	UNCTAD classification (4a)	4a + country-pair- time FEs (4b)
CA_bil	0.0228 (0.0196)	0.0223 (0.0195)		0.0224 (0.0198)		0.0256 (0.0196)	
CA_ILO	-0.120*** (0.0356)	-0.120*** (0.0359)		-0.117*** (0.0357)		-0.135*** (0.0361)	
CA_ILO_LI	0.116*** (0.0308)	0.116*** (0.0319)	0.117*** (0.0323)	0.117*** (0.0308)	0.117*** (0.0311)	0.129*** (0.0309)	0.129*** (0.0311)
TA	0.115* (0.0636)	0.166* (0.0933)		0.148 (0.0920)		0.137 (0.0892)	
CA_ILO_LI_TA	0.00452 (0.0289)	0.00835 (0.0272)	0.0104 (0.0325)	0.0428 (0.0420)	0.0574 (0.0520)	0.0535* (0.0286)	0.0640** (0.0321)
TALP	0.0800 (0.0891)	0.0624 (0.100)		0.0250 (0.0981)		0.0640 (0.0987)	
CA_ILO_LI_TALP	-0.185* (0.0976)	-0.204* (0.107)	-0.208* (0.107)	-0.145* (0.0808)	-0.138* (0.0810)	-0.148* (0.0823)	-0.158* (0.0827)
Depth	-0.0233 (0.0163)	-0.0184 (0.0139)		-0.00936 (0.0153)		-0.0189 (0.0141)	
CA_ILO_LI_Depth				-0.0140 (0.0119)	-0.0182 (0.0146)		
TA lead	0.0905 (0.0851)						
TALP lead	-0.0228 (0.0669)						
Observations	144,818	144,818	133,556	144,818	133,556	144,818	133,556
Exp-time & imp-time FEs	YES	YES (imp-sect-time)	YES (imp-sect-time)	YES	YES	YES	YES
Country-pair FEs		YES	YES (CP-time)	YES	YES (CP-time)	YES	YES (CP-time)
Sector-time FEs	YES	YES	YES	YES			

Note: Poisson regressions. Dependent variable: Bilateral exports, sector level (sector = labor-intensive ; non-labor-intensive). Fixed effects and constants not reported for the sake of simplicity. Imp-sect-time = importer-sector-time fixed effects; CP-time = country-pair-time fixed effects. Standard errors (in parentheses) are clustered at the importer-time, exporter-time and country-pair level.

***p < 0.01, **p < 0.05, *p < 0.1

6. Conclusions

During the last decades, we have witnessed a proliferation of bilateral and regional trade agreements that include specific provisions related to labor rights and working conditions. These agreements are therefore different in their contents and, as a consequence, may well have different economic consequences. Indeed, trade agreements with labor provisions may affect the “institutional comparative advantage” (Nunn and Trefler, 2014) of (labor abundant) countries. Due to the increasing relevance of bilateral/regional trade agreements (rather than WTO-wide agreements), this can have important repercussions on the evolution of global trade flows and economic interconnections.

The number of papers on these issues has been expanding in recent years (e.g. Kamata, 2014; Kamata, 2015; Carrère et al., 2017; and Martínez-Zarzoso and Kruse, 2019). Our paper contributes to this literature by investigating empirically the effect of trade agreements with labor provisions on trade, with a particular focus on “South-to-North” exports, where the effect on the “institutional comparative advantage” is expected to be larger. Differently from the rest of the literature, we explicitly take into consideration “comparative advantage” in our empirical specification and we make use of disaggregate trade flows in labor-intensive and non-labor-intensive goods, to allow for heterogeneous effects across these categories.

Our analysis shows that trade agreements without and with labor provisions have similar effects on trade, and tend to promote “South-to-North” overall exports. However, trade agreements with labor provisions curb the institutional comparative advantage of labor abundant countries, an effect similar in nature to that of having higher labor standards. This represents an important contribution on the consequences of trade agreements with labor provisions on South-North trade relations, above and beyond those on rules of origins and product standards (Anson et al., 2005; Disdier et al., 2015). Such finding provides also some interesting insights both for policy-makers and the academic community. In terms of policy implications, for an exporter from the South, the signing of a trade agreement with labor provisions implies – at best – that exports of labor-intensive goods will increase less respect to a scenario of signing a trade agreement without labor provisions. While this effect is not *per se* harmful, national policies may be needed to accommodate and foster the change in industrial structure

of the country. In terms of venues for further research, the effect of trade agreements with labor provisions should be investigate in more detail, leveraging the availability of firm-level information. Besides, exploring the relation between changes in different aspects of trade policy and the evolution of the industrial structure and export composition could offer crucial contributions for guiding policy choices in the future.

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Appendix

Table A.1 List of labor-intensive goods (as in Busse, 2002)

COMMODITY	SITC code
Fabric and textile yarn	65
Glassware, glass and pottery	664-666
Bedding and furniture	82
Handbags and travel goods	83
Apparel	84
Footwear	85
Games, toys, baby carriages, and sporting goods	894

Source: Busse (2002) and OECD (2001).

Table A.2 List of countries included in the sample

ADVANCED (“NORTH”) ECONOMIES									
AUS	AUT	BEL	CAN	CHE	CYP	DEU	DNK	ESP	FIN
FRA	GBR	GRC	IRL	ISL	ISR	ITA	JPN	LUX	NLD
NOR	NZL	PRT	SWE	USA					
EMERGING AND DEVELOPING (“SOUTH”) ECONOMIES									
ABW	AFG	AGO	ALB	AND	ARE	ARG	ARM	ATG	AZE
BDI	BEN	BFA	BGD	BGR	BHR	BHS	BIH	BLR	BLZ
BMU	BOL	BRA	BRB	BTN	BWA	CAF	CHL	CHN	CIV
CMR	COD	COG	COL	COM	CPV	CRI	CUB	CYM	CZE
DJI	DMA	DOM	DZA	ECU	EGY	ERI	EST	ETH	FJI
FRO	GAB	GEO	GHA	GIB	GIN	GMB	GNB	GNQ	GRD
GRL	GTM	GUY	HKG	HND	HRV	HTI	HUN	IDN	IND
IRN	IRQ	JAM	JOR	KAZ	KEN	KGZ	KHM	KNA	KOR
KWT	LAO	LBN	LBR	LBY	LCA	LKA	LSO	LTU	LVA
MAC	MAR	MDA	MDG	MDV	MEX	MHL	MKD	MLI	MLT
MMR	MNG	MNP	MOZ	MRT	MSR	MTQ	MUS	MWI	MYS
NAM	NCL	NER	NFK	NGA	NIC	NIU	NPL	OMN	PAK
PAN	PER	PHL	PNG	POL	PRK	PRY	PYF	QAT	ROU
RUS	RWA	SAU	SDN	SEN	SGP	SHN	SLB	SLE	SLV
SRB	SUR	SVK	SVN	SWZ	SYC	SYR	TCD	TGO	THA
TJK	TKM	TTO	TUN	TUR	TWN	TZA	UGA	UKR	URY
UZB	VCT	VEN	VGB	VNM	YEM	ZAF	ZMB	ZWE	

Note: ISO three-digit code reported.

Table A.3 Summary statistics

VARIABLE	OBSERVATIONS	MEAN	ST.DEV.	MIN	MAX
Exports	1,074,704	1.58e+08	2.41e+09	0	3.25e+11
Indist	1,074,704	8.66	0.80	4.11	9.89
contig	1,074,704	0.21	0.14	0	1
colony	1,074,704	0.02	0.12	0	1
com_lang	1,074,704	0.15	0.35	0	1
CA_bil	909,796	5.55	15.53	0.01	646
CA_ILO	909,796	4.46	12.24	0	408
CA_ILO_LI	909,796	2.23	8.94	0	408
TA	1,074,704	0.12	0.33	0	1
CA_ILO_LI_TA	909,796	0.12	1.13	0	173
TALP	1,074,704	0.05	0.21	0	1
CA_ILO_LI_TALP	909,796	0.05	0.70	0	112
Depth	1,074,704	0.40	1.27	0	7

Table A.4 Dataset

VARIABLE	DESCRIPTION	SOURCE
Exports	Bilateral exports (nominal value in US dollars) from country of origin <i>i</i> to country of destination <i>j</i> for “sector” <i>s</i> (<i>s</i> =labour-intensive; non-labour intensive) at time <i>t</i>	Observatory of Economic Complexity database
Indist	Bilateral distance between country of origin <i>i</i> and country of destination <i>j</i> (logs)	Gravity database from CEPII
contig	Dummy variable equal to one if country of origin <i>i</i> and country of destination <i>j</i> share the same border, and zero otherwise	Gravity database from CEPII
colony	Dummy variable equal to one if country of origin <i>i</i> and country of destination <i>j</i> ever were in a colonial relationship, and zero otherwise	Gravity database from CEPII
com_lang	Dummy variable equal to one if country of origin <i>i</i> and country of destination <i>j</i> share the same language, and zero otherwise	Gravity database from CEPII
CA_bil	Ratio between the labor to capital ratio in country of origin <i>i</i> and the labor to capital ratio in country of destination <i>j</i>	Penn World Tables
ILO_exp	Country of origin <i>i</i> number of ratified ILO conventions on core labor standards	ILO Database
CA_ILO	Product of CA_bil and ILO_exp	Authors’ calculation
LI	Dummy variable equal to one if sector <i>s</i> is considered as “labor-intensive” (see Busse, 2002 and Table A.1), and zero otherwise	Busse (2002) and OECD (2001)
CA_ILO_LI	Product of CA_ILO and LI	Authors’ calculation
TA	Dummy variable equal to one if country of origin <i>i</i> and country of destination <i>j</i> has a trade agreement in force, and zero otherwise	Regional Trade Agreements Database, WTO
CA_ILO_LI_TA	Product of CA_ILO_LI and TA	Authors’ calculation
TALP	Dummy variable equal to one if country of origin <i>i</i> and country of destination <i>j</i> has a trade agreement with labor provisions in force, and zero otherwise	Horizontal Depth Database (Hofmann et al., 2017)
CA_ILO_LI_TALP	Product of CA_ILO_LI and TALP	Authors’ calculation
Depth	Index ranging from zero to seven. It identifies whether a trade agreement contains the following provisions (codified with dichotomous dummy variables): 1) tariffs (reduction to zero of all tariffs with certain, limited, exceptions); 2) trade in services; 3) investment; 4) standards (such as sanitary and phytosanitary [SPS] measures or technical barriers to trade [TBT]); 5) public procurement; 6) competition policy and 7) intellectual property rights. The index is additive (i.e. it is equal to the sum of all the dichotomous dummy variables).	Design of Trade Agreements Database

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