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The heterogeneous effects of trade agreements with labour provisions

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Abstract

Do trade agreements with labour provisions affect trade differently from those without such provisions? Are their effects heterogeneous with respect to the level of development of the countries involved and the labour intensity of goods traded? In this paper, we implement a state-of-the-art structural gravity model with intranational (i.e. domestic) trade and allow for heterogeneous effects depending on the level of enforceability of labour provisions (weak vs. strong provisions), sector (labour vs. non-labour-intensive goods), members' development level (North vs. South) and combinations of the three dimensions. We show that, overall, the trade effects of trade agreements with labour provisions are larger than those without. However, we also find that while exports from the South to the North display a significant increase after a signature of a trade agreements with no or weak labour provisions, this is not the case if strong labour provisions are included in the agreement, and that such differences tend to be larger for labour-intensive goods.

KEYWORDS

international trade, labour provisions, structural gravity models, trade agreements

1 | INTRODUCTION

Do trade agreements with labour provisions affect trade differently from those without such provisions? Are their effects heterogeneous with respect to the level of development of the countries involved and the labour intensity of goods traded?

Tying trade to labour rights and other labour-related provisions has been a 'long-standing contentious issue' in World Trade Organization talks (Summers, 2001). However, since the deadlock of WTO-wide negotiations in the early 2000s, both the overall number of trade agreements and the amount of those including labour provisions, i.e. legal clauses meant to promote labour market and working conditions and reinforce labour rights in the signatory countries,[1] increased steeply (see Figure 1).

Labour provisions included in trade agreements are expected to affect the ability of exporting through different channels, linked to both production costs and productivity. On one side, the inclusion of labour provisions in a trade agreement may increase the cost of labour, to comply with higher standards, and consequently dampening exports' competitiveness (Busse, 2002). On the other side, labour provisions may have beneficial effects on labour productivity (e.g. ILO, 2016; OECD, 2013), by the means of a variety of factors: from higher wages and worker satisfaction to lower rates of accidents at work, from stimulating innovation and investment in human capital by firms to enhance their governance. Further, enhancing labour provisions may influence foreign demand, as far as consumers and firms from importing economies are concerned with human and worker conditions in exporting economies. These effects are strongly emphasised in Carrère et al. (2021).[2]

Indeed, despite a number of recent scholarly efforts (e.g. Carrère et al., 2021; ILO, 2016; Jinji & Kamata, 2020), the sign and size of the effect of trade agreements with labour provisions on trade is still unclear and the object of discussion in both academic and policy environments.

To shed additional light on this issue, we estimate a state-of-the-art structural gravity model with consistently estimated intranational, i.e. domestic, trade flows, to further explore the effects of trade agreements with labour provisions on bilateral exports. In our analysis, we differentiate between nonenforceable (or weakly enforceable, henceforth 'weak') and legally enforceable (henceforth, 'strong') labour provisions, and explicitly allow for heterogeneity with respect to both the sector (labour vs. non-labour-intensive goods) and the level of development of each country (North vs. South).

In line with previous research, our results show that, on average, trade agreements with labour provisions have larger (positive) effects on bilateral manufacturing trade flows, compared to trade agreements with no labour provision. However, our novel contribution is to uncover and explore the heterogeneity both across sectors and level of development. Importantly, we show that while exports from the South to the North display a significant increase after the entry into force of a trade agreements with no (or weak) labour provisions, this is not the case if strong labour provisions are included in the agreement. This difference tends to be larger in labour-intensive sectors.

[1]This means the inclusion in the treaties of references to core labor standards and other ILO instruments, and mechanisms for enforcement, implementation and cooperation. Their incorporation into the agreements is usually done through specific "social" or "labor" chapters, or side-agreements. For further details, see Raess and Sari (2020).

[2]Using highly disaggregated trade data (HS 6 digit), Nicita and Murina (2017) and Timini and Conesa (2019) provide additional evidence in the direction of the possible existence of such channel for the specific case of sanitary and phytosanitary (SPS) measures.

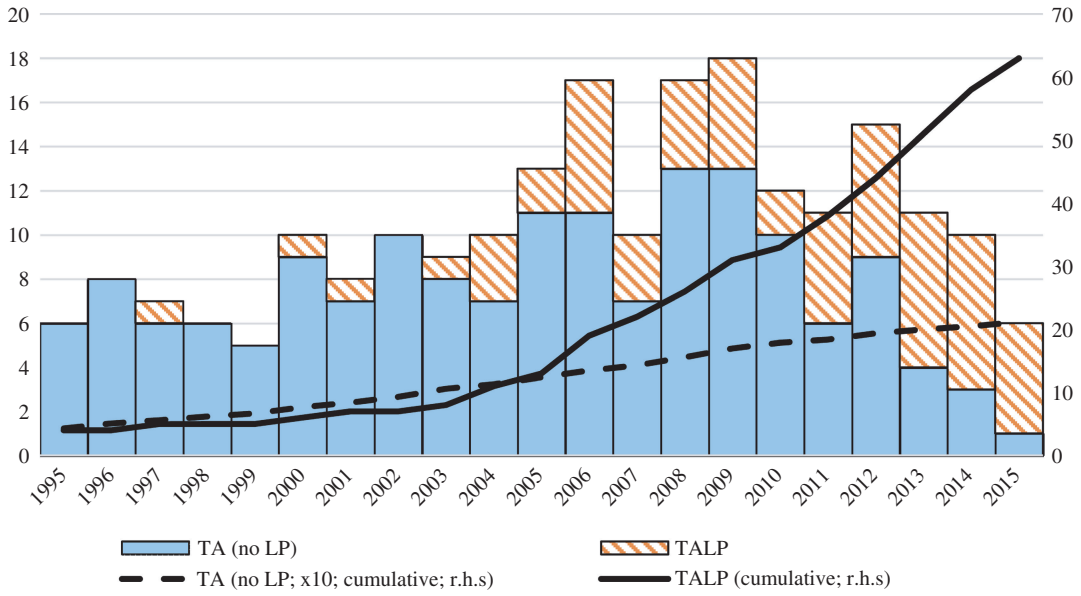

FIGURE 1 Trade agreements with labour provisions, 1995–2015

Note: 'TALP' identifies trade agreement with labour 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 labour 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. [Colour figure can be viewed at wileyonlinelibrary.com]

Our study contributes to two different strands of the literature. First, our paper complements the research focussed on the new generation of trade agreements, i.e. 'deep' trade agreements (Ahcar & Siroën, 2019; Boffa et al., 2019; Brandi et al., 2020; Heid & Vozzo, 2020; Kohl et al., 2016; Laget et al., 2020; Orefice & Rocha, 2014; Osnago et al., 2017, 2019), by expanding the understanding of the impact of trade agreements with labour provisions on trade flows. Second, by taking a more fine-grained approach and using sectoral trade data, our contribution speaks to the literature on the impacts of trade agreements on trade. Our paper shows that sectoral data are important in studying the relation between trade agreements and trade flows given the substantial heterogeneity the aggregate flows hide. To the best of our knowledge, we are the first in implementing such approach for trade agreements with labour provisions specifically.

The remainder of the paper is organised as follows: Section 2 summarises the literature on the effects of trade agreements with labour provisions; Section 3 describes the data and the empirical strategy used; Section 4 presents and discusses the results (including a battery of robustness tests); and Section 5 concludes.

2 | LITERATURE REVIEW: TRADE AGREEMENT, LABOUR PROVISIONS AND STANDARDS, AND TRADE

The nature of the relationship between trade and labour provisions and standards is a long-standing and widely debated topic. Given its policy relevance and the increasing availability of data, a burgeoning body of literature has focussed on the impact of labour standards on trade.

From a theoretical perspective, to disentangle the relation between labour provisions and standards and trade flows is no trivial task. The main reason is that different mechanisms can be operating at the same time, depending on the agreement and countries' specific conditions. Indeed, trade agreements with labour provisions are not only reinforcing existing international commitments (such as, e.g. ILO frameworks and instruments) but also adding new rules and mechanisms of enforcement (such as, e.g. adopting labour action plans to protect labour rights or the obligation to adopt measures related to labour issues—including those discouraging forced labour, and the importation of goods produced using such labour input, see ILO, 2016). Conceptually, one of the main channels linking labour provisions in trade agreements and trade flows is the possible erosion of a country's advantages once its domestic firms are forced to comply with stricter labour regulations. From this point of view, exports of low- and middle-income countries may be negatively affected by labour standards enshrined in trade agreements (Bhagwati, 1995), as those countries tend to specialise in labour-intensive industries and to rely on the availability of cheap labour as a source of comparative or competitive advantage. Besides, countries which are unable or unwilling to comply with higher labour standards may see a deterioration in access to foreign markets if the enforcement of treaty clauses leads to the withdrawal of trade concessions (Carrère et al., 2021).

Trade agreements with labour provisions, however, can also have beneficial effects, leading to better export performance (ILO, 2016). Possible mechanisms linking compliance with labour standards and increase in export flows can operate on both the (domestic) supply side and the (foreign) demand side. From the supply side, improved wages and working conditions, such as health, safety and training, can improve firm-level performance (Brown et al., 2013), fostering aggregate productivity and exports (Carrère et al., 2021). From the demand side, the inclusion and compliance with labour provisions offer an important signal in foreign markets. In the light of the growing attention and possible strong impact of socially concerned consumers (Harrison & Scorse, 2010), the demand for exports may increase as a result of improvements on working regulations. This may stimulate a virtuous circle as exporters may be willing to comply more closely to labour standards knowing the demand for their products is likely to increase. This type of dynamic has been documented in the case of Vietnamese firms (Malesky & Mosley, 2018).

While it is not possible, a priori, to define what the impact of labour provision on trade flows would be, it is important to keep in mind that trade-enhancing and trade-reducing mechanisms can be in place at the same time. For instance, while labour provisions in trade agreement may lead to increase in labour costs and the erosion of domestic comparative advantage in labour-intensive activities, the increase in foreign demand may, at least to some extent, offset the reduction in export flows (Carrère et al., 2021). Besides, the direction of trade flows is an important factor in determining what mechanisms may be relevant. As the brief discussion over the mechanisms highlighted, the erosion of competitiveness may be particularly relevant for developing countries. Similarly, as labour conditions and standards in developed countries tend to be high, the effect of labour clauses in trade agreements is likely to have a rather limited impact.

Numerous contributions have tried to empirically assess the effect of labour standards and provisions on trade flows.[3] Previous research has shown empirically that a change in nation-wide

[3]An important part of studies on labor provisions in trade agreements have focused on analyzing the relationship between trade agreements with labor provisions and countries' labor standards or other labor market conditions (such as minimum wage, unemployment benefits, etc.; see, e.g. Kamata, 2014; Kamata, 2015; Martinez-Zarzoso & Kuse, 2019). Most studies in these groups report mixed results, with trade agreements with labor provisions influencing only certain labor market and working condition indicators (e.g. minimum wage, unemployment rate, composite/proxy measures of labor rights). Since the focus of our analysis is on trade effects of labor provisions, we concentrate our review on that more pertinent part of the literature.

labour standards has heterogeneous effects on the trade performance of a country. Busse (2002) and Busse and Braun (2004) indicate that forced and child labour increase the endowment of labour, positively affecting exports by reinforcing exporters' comparative advantage, particularly in labour-intensive goods. Using a 'naïve' gravity model,[4] Kucera and Sarna (2006) find that labour rights (and specifically trade union rights) have a strong positive relationship with total bilateral manufacturing exports. However, they also show that this strong association is concentrated in non-labour-intensive products. In their analysis, exports of labour-intensive goods show either a zero or negative association with labour rights.

Relatedly, the research on the effects of trade agreements with labour provisions (and of the so-called 'deep' trade agreements[5]) is developing fast. However, the literature has so far provided mixed evidence.

Using a 'naïve' gravity model, ILO (2016) find that both trade agreements with and without labour provisions have positive effects on bilateral merchandise exports, and while the point estimate of the former group is larger than that of the latter, they are not statistically different. Additionally, ILO (2016) does not find support for differential effects related to the level of development ('North' and 'South').

However, the analysis by ILO (2016) suffers from some important shortcomings as neither multilateral trade resistances (MTRs), i.e. exporter's and importer's overall 'market thickness' (Fally, 2015) nor unobservable bilateral time invariant trade costs are controlled for.[6] The biases arising from their exclusion are discussed in Baier and Bergstrand (2007), Baldwin and Taglioni (2007) and Egger and Nigai (2015), and summarised in Yotov et al. (2016). Particularly, accounting for unobservable bilateral time invariant trade costs allows to better control for endogeneity, which is expected to bias the 'trade agreement effect' estimates upwards, as countries may be more likely to sign a trade agreement with large (rather than small) trade partners. The recent sensitivity analysis conducted by Ahcar-Olmos and Rodríguez-Barco (2020) confirm the existence and direction of such bias. Additionally, the failure of properly accounting for the asymmetric nature of such bilateral trade costs is another source of bias. As argued by Waugh (2010), this is particularly important for directional estimates, and especially 'South-North' vs. 'North-South' trade, as exporters from the 'South' systematically incur in higher trade costs relative to exporters from the North.

Differently from Carrère et al. (2021) and ILO (2016) effectively control for MTRs, but only include observable (symmetric) bilateral trade costs (such as distance, contiguity, common

[4]Head and Mayer (2014) explains in detail what a "naïve" gravity model means. In short, the most important characteristic of a "naïve" gravity is that it does not take into account explicitly the multilateral trade resistances, something that Baldwin and Taglioni (2007) demonstrate as a potential source of bias. However, we should acknowledge that, at the time, Kucera and Sarna's (2006) approach was the standard in the literature.

[5]The expression "deep trade agreements" refers to trade agreements including different sets of provisions other than tariff reductions. Indeed, there are several studies that in recent years dealt with the number or type of provisions included in trade agreements. For example, Horn et al. (2010) provide an in-depth analysis of the content of EU and US trade agreements, and the legal enforceability of each provisions. Kohl et al. (2016) extend Horn et al. (2010) analysis to 296 agreements. By separating estimating the effect of two group of provisions, those that are part of the WTO's mandate and those that are not, they find that trade agreements have heterogeneous effects on trade, and the former set of provisions is particularly trade promoting. Boffa et al. (2019) and Laget et al. (2020) find that "deep trade agreements" also foster global value chains.

For a comprehensive analysis of the evolution and characteristics of deep trade agreements, see Mattoo et al. (2020).

[6]The standard approach in the literature is to include the former as exporter-time and importer-time fixed effects and the latter as (directional) pair fixed effects.

language, etc.) and decide to tackle endogeneity issues related to trade agreements by restricting the sample to those country pairs with a trade agreement in force. They further reduce the sample by income levels to estimate three out of four geographical combinations: North-North, South-South and South-North (but not North-South). They find that, overall, trade agreements with labour provisions do not have different effects from their control group (trade agreements without such provisions) on manufacturing exports. However, the authors do find a differential (positive) effect in the case of South-North exports. Given the reduced sample used for their analysis, it is unclear whether these findings are generalizable and comparable with the rest of the gravity literature.

Kamata (2014) uses OLS estimation techniques to estimate a pseudogravity model in first differences that departs from the rest of the gravity literature (and incurs in several potential sources of biases mentioned in Baldwin & Taglioni, 2007). Kamata's model explains total real bilateral trade flows with exporter's and importer's GDP, two lagged trade agreement dummies and year fixed effects. On the basis of the results of this model, Kamata (2014) argues that trade agreements with labour provisions have smaller effects, if any, on 'South-to-North' exports (with respect to a trade agreement without labour provisions).

Jinji and Kamata (2020) use both OLS and Poisson pseudo-maximum likelihood estimation strategy and include domestic trade flows, a relatively recent advance in the gravity literature, to estimate the effect of a trade agreement with labour provisions on bilateral manufacturing exports. Apart from using own estimates of domestic trade flows,[7] they use real export values and lagged (but not contemporaneous) trade policy variables. With these settings, Jinji and Kamata (2020) show seemingly counterintuitive results.[8] On the one hand, in their Poisson pseudo-maximum likelihood estimations, they find that trade agreements with legally enforceable labour provisions have larger positive effects on trade than agreements with no such provisions. These effects are mostly concentrated in North-North trade, possibly capturing the 'European Union effect'. On the other hand, trade agreements with weak (i.e. nonlegally enforceable) labour provisions tend to have a smaller impact (with respect to agreements with no such provisions), if any. The impact on North-North trade would be negative. Limited explanations are offered on the possible drivers of these results.

Nevertheless, all these previous contributions have pushed forward our understanding of the nature and characteristics of trade agreements with labour provisions and already offered some insights into their effects on trade, whose size and direction are, however, still debated. Due to the advances in structural gravity models and availability of more detailed data, we are able to provide a novel perspective on this contested issue.

In this context, we tackle a number of issues so far remained unaddressed in the literature. First, we aim to provide unbiased estimates of the effect of trade agreements with labour provisions on bilateral trade flows. To do so, we implement a state-of-the-art structural gravity model, with theory-coherent MTRs, unobservable asymmetric bilateral time invariant trade costs and domestic trade estimated in a consistent way. Second, we allow for heterogeneous effects of trade agreements with labour provisions, by checking if their impact depends on the countries and sectors involved. Accounting for the level of development of the countries involved is relevant given the heterogeneous level of labour standards particularly for North-South and South-North trade

[7]While Jinji and Kamata (2020) acknowledge that they use gross output data from UNIDO, it is not clear how they deal with the considerable number of missing data in the UNIDO database.

[8]Given the possible biases in OLS estimations arising from heteroscedasticity, we focus on Poisson pseudo-maximum likelihood estimation results. However, the OLS results are similarly puzzling.

relations, as large differences exist among trade partners' regulations and provisions, and economies in the South tend to have fewer labour rights (see Figure A.1 in the Appendix). Estimating sectoral gravity equations (labour-intensive vs. non-labour-intensive sectors; and ISIC two-digit sectors) is an important step as trade agreements with labour provisions may have heterogeneous effects on production factors (labour vs. capital).

3 | METHODOLOGY AND DATA

3.1 | Data

Trade data are from the 'International Trade and Production Database for Estimation' (ITPD-E). This database contains yearly bilateral trade flows for 243 countries and 120 (four-digit International Standard Industrial Classification [ISIC] rev.3) manufacturing sectors since the year 2000, constructed in a homogeneous and consistent way, and includes domestic trade flows.[9] Note that in the ITPD-E, flows are reconciled, and the value of exports from *i* to *j* in *t* is equal to the value of *j*'s imports from *i*. For further details, we refer to Borchert et al. (2021).

Trade agreements information is retrieved from the World Bank Horizontal Depth Database (Hofmann et al., 2017), which provides data on the content of trade agreements, including the coverage of labour provisions.

Bilateral distance, WTO and EU membership are taken from the geography database by CEPII, the measure of 'depth' of a trade agreement from Dür et al. (2014), and tariffs from the World Bank World Development Indicators. All these variables are used in robustness checks. Summary statistics are reported in Table A.1 in the Appendix.

3.2 | Empirical strategy

We follow Anderson and van Wincoop (2003), Baier and Bergstrand (2007), Head and Mayer (2014) and Yotov et al. (2016) in implementing a state-of-the-art structural gravity model to assess the effect of trade agreements with labour provisions on exports flows. Gravity models explain bilateral trade flows by transaction costs and economic size, while controlling for MTRs and endogeneity issues. There are several theoretical properties of structural gravity models that allow us to maintain a simple empirical framework even if considering labour-intensive and non-labour-intensive sectors: indeed, structural gravity controls for country-specific factors such as the level of productivities (Ricardian comparative advantage through technology differences), or the level of factor endowments (Heckscher–Olhin comparative advantage through endowment differences). To this extent, Deardoff (1998) and Eaton and Kortum (2002), respectively, show that also in a Heckscher–Olhin or Ricardian framework,

[9]While the database also includes agricultural, mining and service data, we limit our analysis to manufacturing trade for the following reasons: to ensure comparability with similar studies (e.g. Busse and Braun, 2004; Busse, 2002) and across sectors (as, e.g., agricultural sectors are not codified using ISIC classification); to cope with the lack of information on the labor intensity of agricultural production (both within agricultural sectors, and between, e.g., agriculture and manufacturing). Trade in services is often treated separately due to their different nature (see, e.g., Anderson et al., 2018).

the gravity equation is practically identical,[10] and including capital-labour ratio (or other similar measures such their difference) would not be warranted by the theory. Additionally, as summarised by Feenstra and Taylor (2017), such measures of factor endowment ratios do not deliver consistent results if there are more than two production factors (e.g. land, labour and capital) or if different types of labour exist. Additionally, gravity models are separable (Anderson & van Wincoop, 2004; Anderson & Yotov, 2010): this means that a theory-consistent gravity equation can be estimated separately for each sector or by pooling sectors together (while adapting bilateral costs and MTRs to the existence of sectors).[11] We therefore perform different sets of estimations, using aggregate bilateral trade and separating exports of goods of different labour intensity. We use the classification applied by Busse (2002) and Busse and Braun (2004), based on OECD (2001), and widely adopted by studies dealing with trade and labour intensity. This classification divides products from the Standard International Trade Classification (SITC) into two categories: labour-intensive and non-labour-intensive products. Using this information, we link products to four-digit ISIC rev. 3[12] (see Table A.2 in Appendix for more details). This dichotomous classification helps us in understanding whether there are any differences across these two broadly-defined sectors. In this sense, and to alleviate the computational burden, we aggregate the ITPD-E data up to the aforementioned two sectors: labour-intensive and non-labour-intensive goods.[13] However, as a robustness test, we will complement the analysis by running (two-digit ISIC) sector-level regressions, to both ensure the validity of our aggregation and check if a more disaggregated analysis can provide additional insights (by treating labour intensity in a more continuous way).

In all our specifications, we use a Poisson pseudo-maximum likelihood estimating procedure, as proposed by Santos Silva and Tenreyro (2006), to properly address the presence of zeros and heteroscedasticity, two features typical of trade data.

Our more conservative specification can be written as follows:

$$X_{ijt} = \exp\left(\beta_0 + \beta_1 TA_{ijt} + \delta_{it} + \gamma_{jt} + \omega_{ij}\right) + \varepsilon_{ijt} \quad (1)$$

where X_{ijt} is manufactured exports (either aggregate, labour-intensive or non-labour-intensive) of country i to country j at time t. Following Dai et al. (2014), Larch et al. (2018) and Yotov (2012), X_{ijt} includes domestic trade flows (X_{ijt}, $\forall$ i=j). In this way, we account for possible domestic-to-international trade diversion effects. Indeed, a trade agreement alters both relative costs among foreign markets (members vs. non-members) and between the domestic market and the markets of foreign signatory partners. TA_{ijt} is a dummy variable, and it is equal to 1 when countries i and j have a trade agreement in force at time t, and zero otherwise, independently of the provisions included in the agreement. In Equation (1) then, we are simply measuring the 'average treatment effect' of signing a trade agreement on trade. In line with structural gravity theory (Baier & Bergstrand, 2007), we include exporter-time (δ_{it}), importer-time (γ_{jt}) fixed

[10]As demonstrated by Arkolakis et al. (2012), and summarized in Yotov et al. (2016), "a large class of models generate *isomorphic* gravity equations" (p. 13).

[11]For more details on other aspects of gravity models, we refer to Baldwin and Taglioni (2007) and Yotov et al. (2016).

[12]We use the conversion tables available from Eurostat to translate SITC codes in ISIC. Importantly, the classification by Busse (2002) and Busse and Braun (2004) is based on three-digit SITC codes. In most of the cases, a three-digit SITC code can be univocally linked to a single four-digit ISIC code. When this is not possible (roughly 25% of the codes used in the Busse classification), the most frequent four-digit ISIC code is used.

[13]The original ITPD-E data for manufacturing corresponds to more than 34.6 million observations.

effects, and directional-pair fixed effects (ω_{ij}). Exporter-time and importer-time fixed effects constitute a theory-consistent way to control for MTRs, and absorb all exporter and importer time-varying characteristics (e.g. GDP, GDP per capita and population). Importantly, they also absorb a country's range of commitments at the International Labour Organization (ILO) concerning labour standards, therefore reinforcing our identification strategy. On the other side, directional-pair fixed effects control for asymmetric trade costs and trade imbalances (Waugh, 2010) and are consistent with Baier and Bergstrand (2007) strategy to deal with trade policy endogeneity. Finally, we follow Egger and Tarlea (2015) and use three-way clustered standard errors (by exporter, importer and time).

We then proceed to gradually disentangle the 'average' trade agreement effect in different categories, separating by labour provisions (existence and strength) and development (North vs. South) characteristics.

In Equation (2) below, we use Equation (1) as a starting point and allow for heterogeneous effects of trade agreements with and without labour standards. We do so by splitting the TA_{ijt} dummy in two:

$$X_{ijt} = \exp\left(\beta_0 + \beta_1 TA\_noLP_{ijt} + \beta_2 TA\_LP_{ijt} + \delta_{it} + \gamma_{jt} + \omega_{ij}\right) + \varepsilon_{ijt} \quad (2)$$

Here, TA_noLP_{ijt} is a dummy variable, and it is equal to 1 when countries i and j have a trade agreement without labour provisions in force at time t and zero otherwise. TA_LP_{ijt} is also a dummy variable, and it is equal to 1 when countries i and j have a trade agreement with labour provisions in force at time t and zero otherwise. This means that both coefficients $\beta_1$and β_2 represent the 'level' increase in bilateral trade due to TA_noLP_{ijt} and TA_LP_{ijt} respectively. The sum of the two variables captures the universe of trade agreements in our sample (TA_{ijt}).

We further separate trade agreements with labour provisions in two groups: one with nonlegally enforceable labour provisions, such as vague reference to some guiding principles or based on weak legal language (e.g. 'should encourage'; 'recognise the importance'; 'shall work jointly to encourage and support'); and the other with legally enforceable labour provisions. These two groups are already codified differently in the Horizontal Depth database.[14]

$$X_{ijt} = \exp\left(\beta_0 + \beta_1 TA\_noLP_{ijt} + \beta_2 TA\_LP\_WEAK_{ijt} + \beta_2 TA\_LP\_STRONG_{ijt} + \delta_{it} + \gamma_{jt} + \omega_{ij}\right) + \varepsilon_{ijt} \quad (3)$$

Here, TA_noLP_{ijt} is defined as above. $TA\_LP\_WEAK_{ijt}$ is a dummy variable that is equal to 1 when countries i and j have a trade agreement with weak labour provisions in force at time t and zero otherwise. In the same fashion, $TA\_LP\_STRONG_{ijt}$ identifies trade agreements with strong labour provisions.

We then allow for heterogeneous effects of trade agreements depending on the level of development of trade agreement members. More in details, we follow Boffa et al. (2019) and Heid and

[14]For further details on the methodology used for assembling the Horizontal Depth database, please refer to Hofmann et al. (2017). Hofmann et al. (2017) also thoroughly describe the common and differing elements among the Horizontal Depth database and previous efforts, such as Horn et al. (2010) and Kohl et al. (2016). The three databases share the methodology on how they coded legally versus nonlegally enforceable measures, mostly exploiting the legal language/formulas used in the text of each agreement. They differ in the geographic coverage (e.g. Horn et al., 2010, focus on US and EU agreements), and the number of provisions included (e.g. Kohl et al., 2016, include 17 policy areas, whereas Hofmann et al., 2017, codified 52 different policy areas). For further details on the differences, please also refer to Hofmann et al. (2017).

Vozzo (2020) and separate countries into advanced and emerging and developing countries. Following the extant literature on similar subjects (i.e. trade and development, see Aleksynska & Havrylchyk, 2013; Anson et al., 2005; Disdier et al., 2015; Melitz, 2003; Montout & Zitouna, 2005; UNCTAD, 2013; Vicard, 2013), we label these two groups 'North' and 'South'. The 'North' corresponds to high-income OECD or EU members.[15] We separate then the exports relations in four groups: North-North, South-South, North-South and South-North. The directional separation of North-South and South-North is important given the heterogeneity in the burden that labour provisions may pose for exporters in the North and in the South (see, e.g. Disdier et al., 2015; UNCTAD, 2013). As above, all the coefficients are interpretable as 'level' effects.

4 | RESULTS

4.1 | Main results

The main results from the structural gravity model estimated with Poisson pseudo-maximum likelihood techniques are presented in Table 1. In our first result (Column 1.a), in line with most research, we find that, on average, trade agreements (TA_{ijt}) boost bilateral trade between members, by approximately 10% (i.e. $100*[e^{\beta^{TA}}-1]$). On average, this effect is mostly concentrated on non-labour-intensive products (Column 1.b and 1.c). When we separate trade agreements between those without (TA_noLP_{ijt}) and those with labour provisions (TA_LP_{ijt}) (Columns 2.a–2.c), and then further isolate trade agreements with weak ($TA\_LP\_WEAK_{ijt}$) and strong labour provisions ($TA\_LP\_STRONG_{ijt}$) (Columns 3.a–3.c), we find that the trade effect of agreements with strong provisions (that includes the EU) outperforms the others, particularly for non-labour-intensive goods. These results are in line with those of a recent strand of the literature arguing that 'new generation' agreements tend to have larger economic impacts with respect to the rest (Ahcar & Siroën, 2019; Kohl et al., 2016; Laget et al., 2020). In Columns 4.a–4.c and Columns 5.a–5.c, we further disentangle the effects by level of development of the trade agreement members. When doing so, we uncover the existence of important heterogeneity across type of agreements and level of development of its members. North-North trade flows increase as a consequence of both trade agreements without labour provisions ($TA\_noLP\_NN_{ijt}$) and those with strong labour provisions ($TA\_LP\_STRONG\_NN_{ijt}$). However, such effects tend to be concentrated on non-labour-intensive goods for the latter. North-South exports increase as a result of the entry into force of any of the three types of trade agreements considered (without [$TA\_noLP\_NS_{ijt}$], with weak [$TA\_LP\_WEAK\_NS_{ijt}$] or with strong labour provisions [$TA\_LP\_STRONG\_NS_{ijt}$]). These effects are concentrated in non-labour-intensive goods. South-North exports show very different patterns depending on the type of trade agreement signed: trade agreements without labour provisions ($TA\_noLP\_SN_{ijt}$) boost South-North exports of labour-intensive goods; trade agreements with weak labour provisions ($TA\_LP\_WEAK\_SN_{ijt}$) promote South-North non-labour-intensive exports, whereas trade agreements with strong labour provisions do not have any positive effect on South-North exports ($TA\_LP\_STRONG\_SN_{ijt}$). In other words, this means that there is a substantial difference among trade agreement types in terms of trade creation. This is evident in the

[15]Given our period of analysis, 2000–2015, and in line with most of the literature analyzing a similar period, we label as "North" high-income OECD or EU members, more precisely: Australia, Canada, Iceland, Israel, Korea (Rep. of), Japan, New Zealand, Norway, Switzerland, United States and EU members. We prefer not to separate EU members between "North" and "South" as the EU has a common trade policy stance, known as "Common Commercial Policy" or "EU Trade Policy". Main results, however, are not sensitive to the inclusion of the EU "New Members States" (i.e. 2004 accession) in the "South".

TABLE 1 Trade agreements with labour provisions and trade flows

	TA			*TA_noLP* and *TA_LP*			*TA_noLP*, *TA_LP_WEAK* and *TA_LP_STRONG*
	1			2			3
Variables	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.
TA_{ijt}	0.0972**	−0.0002	0.121***				
	(0.0411)	(0.102)	(0.0377)				
$TA\_NO\_LP_{ijt}$				0.0505	−0.0415	0.0777	0.0509
				(0.0761)	(0.172)	(0.0552)	(0.0765)
TA_LP_{ijt}				0.143***	0.0434	0.163**	
				(0.0544)	(0.0505)	(0.0665)	
$TA\_LP\_WEAK_{ijt}$							0.104
							(0.0675)
$TA\_LP\_STRONG_{ijt}$							0.175***
							(0.0642)
$TA\_NO\_LP\_NN_{ijt}$							
$TA\_LP\_NN_{ijt}$							
$TA\_LP\_WEAK\_NN_{ijt}$							
$TA\_LP\_STRONG\_NN_{ijt}$							
$TA\_NO\_LP\_NS_{ijt}$							
$TA\_LP\_NS_{ijt}$							
$TA\_LP\_WEAK\_NS_{ijt}$							
$TA\_LP\_STRONG\_NS_{ijt}$							
$TA\_NO\_LP\_SN_{ijt}$							
$TA\_LP\_SN_{ijt}$							

		Col. 2 + North-North; North-South; South-North; South-South			Col. 3 + North-North; North-South; South-North; South-South		
		4			5		
(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.
−0.0417	0.0785						
(0.172)	(0.0558)						
0.123***	0.0938						
(0.0430)	(0.0713)						
0.00814	0.227***						
(0.0640)	(0.0739)						
		0.138*	0.106	0.123	0.142**	0.106	0.127
		(0.0735)	(0.0873)	(0.0797)	(0.0707)	(0.0870)	(0.0792)
		0.119*	0.0812*	0.127			
		(0.0691)	(0.0486)	(0.0824)			
					0.00759	0.109**	−0.00878
					(0.0421)	(0.0472)	(0.0428)
					0.215***	0.0701	0.255***
					(0.0742)	(0.0651)	(0.0796)
		0.148**	0.0366	0.170***	0.149**	0.0395	0.170***
		(0.0607)	(0.146)	(0.0510)	(0.0598)	(0.145)	(0.0511)
		0.254**	0.0534	0.263**			
		(0.123)	(0.0979)	(0.116)			
					0.347*	0.114	0.351**
					(0.178)	(0.179)	(0.164)
					0.134**	0.0317	0.145**
					(0.0596)	(0.103)	(0.0611)
		0.0983**	0.333***	0.0640	0.106**	0.335***	0.0713
		(0.0479)	(0.0971)	(0.0545)	(0.0489)	(0.0970)	(0.0570)
		−0.0132	0.0761	−0.00930			
		(0.0789)	(0.105)	(0.0777)			

(Continues)

TABLE 1 (Continued)

Variables	TA			*TA_noLP* and *TA_LP*			*TA_noLP*, *TA_LP_WEAK* and *TA_LP_STRONG*
	1			2			3
	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.
$TA\_LP\_WEAK\_SN_{ijt}$							
$TA\_LP\_STRONG\_SN_{ijt}$							
$TA\_NO\_LP\_SS_{ijt}$							
$TA\_LP\_SS_{ijt}$							
$TA\_LP\_WEAK\_SS_{ijt}$							
$TA\_LP\_STRONG\_SS_{ijt}$							
Exporter-time FE	YES	YES	YES	YES	YES	YES	YES
Importer-time FE	YES	YES	YES	YES	YES	YES	YES
Dir. pair FE	YES	YES	YES	YES	YES	YES	YES
Observations	669,633	587,744	656,783	669,633	587,744	656,783	669,633

Notes: Poisson regressions. Dependent variable: Bilateral exports. Fixed effects and constants not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the exporter, importer and time level.

$^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$.

case of South-North exports: trade agreements with labour provisions tend to curb exports of the South, especially when labour provisions are legally enforceable. These results echo the findings of other papers looking at the effects of the 'new generation' of trade agreements on South-North total manufacturing trade, such as Anson et al. (2005) and Disdier et al. (2015), focussing on standard harmonisation and rules of origins respectively. The authors of the two paper find that the nontariff measures contained in the 'new generation' agreements act as a brake to trade expansion, partially or totally undoing traditional trade-promoting effects. Finally, trade agreements with labour provisions ($TA\_LP\_WEAK\_SS_{ijt}$ and $TA\_LP\_STRONG\_SS_{ijt}$) are promoting South-South trade. However, the positive effects of those with strong labour provisions ($TA\_LP\_STRONG\_SS_{ijt}$) are concentrated in non-labour-intensive goods. Generally, our findings show that trade increase along the line of traditional trade theory: trade liberalisation induces countries to specialise 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 (Baghdadi et al., 2013; Nunn & Trefler, 2014). On the one hand, trade agreements without

		Col. 2 + North-North; North-South; South-North; South-South			Col. 3 + North-North; North-South; South-North; South-South		
		4			5		
(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.
					0.139**	0.200	0.118*
					(0.0567)	(0.146)	(0.0612)
					−0.177**	−0.0775	−0.159*
					(0.0770)	(0.115)	(0.0883)
		−0.0487	−0.309	0.0195	−0.0481	−0.308	0.0206
		(0.140)	(0.218)	(0.111)	(0.140)	(0.218)	(0.111)
		0.282***	−0.0954	0.421***			
		(0.0609)	(0.0822)	(0.0877)			
					0.342***	0.151***	0.376***
					(0.0738)	(0.0462)	(0.0913)
					0.262***	−0.166*	0.436***
					(0.0860)	(0.0925)	(0.106)
YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES
587,744	656,783	669,633	587,744	656,783	669,633	587,744	656,783

labour provisions do not place any restrictions on countries concerning the adoption of lax regulations. In this context, the reduction of tariff (and nontariff) measures implied by the entry into force of the trade agreement may reinforce the competitiveness of Southern countries in labour-intensive sectors, for example, by incentivizing the relocation of labour-intensive production (Baghdadi et al., 2013). Indeed, the positive $TA\_noLP\_SN_{ijt}$ coefficient suggests that such an effect may be prevailing in South-to-North exports. On the other hand, as discussed for labour protection more in general by Nunn and Trefler (2014), trade agreements with labour provisions may contribute to countries acquiring comparative advantages in more complex industries. As labour-intensive goods are less complex, we would expect trade agreements with labour provisions to foster non-labour-intensive exports in both northern and southern countries. This effect seems to be prevailing in trade relations between partners of the same level of development (North-North; South-South).

4.2 | Robustness tests

In our robustness checks, we focus on disentangling potential confounding factors so to reduce our concerns for possible omitted variable bias. The results of an alternative set of specifications are reported in Table 2.

Therefore, we tackle the possible existence of confounding factors related to unobserved time-varying bilateral trade costs by including additional variables with variation at the exporter-importer and time level in the regression. In brief, we account for the 'depth' of the trade agreement, i.e. an index accounting for provisions other than labour included in the trade agreement, WTO membership of the pair, importer tariffs, or the 'EU effect'. Additionally, we also follow Bergstrand et al. (2015) and implement three alternative specifications by including: a time-varying bilateral distance effect, i.e. an interaction between bilateral distance and year dummies; a time-varying 'globalisation effect', i.e. an interaction between the 'international border'[16] and year dummies; and a combination of the two.

Our main results do not change across specifications. Specifically, while the sign of certain variables may change due to the very high number of fixed effects inserted in the regressions, the difference between the effect of trade agreements without labour provisions and those with (strong) labour provisions on exports from the South to the North remains stable across all specifications: the $TA\_noLP\_SN_{ijt}$ effect tends to be larger than that of $TA\_LP\_STRONG\_SN_{ijt}$, and particularly so for labour-intensive exports.

More in details, in Column 1, we include an index that measures the 'depth' of a trade agreement, by summarising relevant chapters, clauses and provisions included in the agreement other than labour provisions. This is important because provisions in trade agreements are typically bundled (e.g. Kohl et al., 2016): trade negotiators usually discuss 'package deals', including a variety of different provisions and topics. Given this bundling of provisions, it is possible that other elements of these 'deep' trade agreements are responsible for creating the institutional or economic conditions leading to the observed trade effects. We use the (normalised) additive index proposed by Dür et al. (2014),[17] reflecting the standard approach used by other papers on specific provisions of trade agreements (e.g. Brandi et al., 2020; Egger et al., 2015), including labour provisions (Carrère et al., 2021), to control for other trade agreement characteristics. Using the 'depth' index, we then make sure—in the best possible way—that the effect captured by our trade agreement dummies is not reflecting other provisions. This index takes into account whether or not a trade agreement includes substantive provisions across its most relevant policy areas: tariffs (reduction to zero, with only few exceptions allowed), standards, services, investment, public procurement, competition and intellectual property rights. Importantly, as mentioned above, the index does not include labour provisions. While in the literature there is no consensus yet on the sign and significance of 'depth', we note that in our sample, the 'depth' of a trade agreement does not have a significant effect on bilateral manufacturing trade.

In Column 2, we take into account WTO membership, by including a dummy variable that is equal to 1 if both the exporter and the importer are WTO members at time t and zero otherwise. The WTO dummy is not significant. This is not surprising considering a number of issues: first, our sample starts in 2000, and the multilateral trading system has achieved little results since;

[16]The international border dummy is equal to 1 if exporter is different from the importer, and 0 otherwise.

[17]Results are robust to the alternative measure proposed by Dür et al. (2014), which relies on latent trait analysis.

second, Esteve-Pérez et al. (2020) recently argue that the average WTO effect on trade is not significantly positive, although this may be only covering very heterogeneous effects (Felbermayr et al., 2020).

In Column 3, we include tariffs. We use applied tariff data, simple mean for manufacturing products.[18] The tariff coefficient can be expressed in terms of trade elasticity of substitution, $\sigma = -\beta_{TARIFF}$. The value of σ (3.6) that can be extracted from the regression corresponding to total bilateral manufacturing trade is very close to the value indicated by Bajzik et al. (2020) as a result of a meta-analysis of the literature and Bernard et al. (2003) estimation results.

In Column 4, we separate the EU, a special type of trade agreement with labour provisions. Even if we previously took into account the existence of deep trade agreements, we separate the EU to provide a further 'accuracy check' on our estimates. In line with the literature, the EU (enlargement) effect (EU_{ijt}) is large, positive and significant for total bilateral manufacturing trade, and larger than the average trade agreement effect (TA_{ijt} in Column 1.a, Table 1).

In Column 5, we include an interaction between bilateral distance and year dummies. In this way, we allow for bilateral distance effect to have a time-varying effects. This allows to disentangle reductions in bilateral trade costs that are not strictly related to the signing of a trade agreement, but rather to a wider process of trade integration.

In Column 6, we insert an interaction between the international border variable, defined as a dummy that takes value 1 if the bilateral trade relation is international, i.e. if the exporter is different from the importer, and 0 otherwise, and year dummies. Such interaction allows to capture any time-varying effect that affect domestic and international trade differently. In short, this would allow to discern the trade agreement effect from 'globalisation-related' trade effects, i.e. general reductions in international trade costs occurring over time and unrelated to the trade agreement.

In Column 7, we enter in the regression the two effects simultaneously.

Additionally, we complement the analysis by running individual (two-digit ISIC) sector-level regressions, to both ensure the validity of our aggregation (based on Busse, 2002) of labour-intensive and non-labour-intensive sectors. With this further robustness check, we also consider if a sector-specific analysis can provide additional insights.

For sake of brevity, we report the full regression results in Table A.3 in the Appendix, together with complementary visual and descriptive analysis (Figures A.2 and A.3, and text thereafter), but we summarise the main points of this robustness check here.

The sector-level findings reinforce our main conclusion: the effect of trade agreements without labour provisions on exports from the South to the North is larger than that of trade agreements with strong labour provisions, especially in labour-intensive sectors (for example, in sectors such as manufacturing of textile, ISIC 17, and of wearing apparel, ISIC 18).

To summarise, our main results do not vary across specifications, and sector-level regressions are in line with and support the results based on more aggregate export data. In particular, the effect of trade agreements without labour provisions on exports from the South to the North is larger than that of trade agreements with strong labour provisions, and particularly so for labour-intensive exports.

[18]We also use interchangeably applied tariff data (weighted mean) and MFN (both simple and weighted mean) for manufacturing products in a set of alternative regressions (not reported in the text). Main results are not sensitive to these changes.

TABLE 2 Trade agreements with labour provisions and trade flows, robustness tests

	Depth			WTO membership			Tariffs			EU effect
	1			2			3			4
Variables	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.
$TA\_NO\_LP\_NN_{ijt}$	0.0825	0.0403	0.0947	0.142**	0.106	0.127	0.132*	0.0928	0.118	0.140**
	(0.103)	(0.121)	(0.111)	(0.0705)	(0.0872)	(0.0792)	(0.0716)	(0.0927)	(0.0796)	(0.0702)
$TA\_LP\_WEAK\_NN_{ijt}$	−0.0714	0.0202	−0.0517	0.00810	0.110**	−0.00823	0.00157	0.107**	−0.0143	0.00735
	(0.0762)	(0.156)	(0.0761)	(0.0429)	(0.0476)	(0.0419)	(0.0333)	(0.0474)	(0.0412)	(0.0308)
$TA\_LP\_STRONG\_NN_{ijt}$	0.166**	0.0173	0.229**	0.215***	0.0702	0.256***	0.203***	0.0612	0.242***	
	(0.0847)	(0.105)	(0.0891)	(0.0742)	(0.0651)	(0.0796)	(0.0740)	(0.0647)	(0.0794)	
$TA\_NO\_LP\_NS_{ijt}$	0.108	−0.00236	0.147**	0.149**	0.0355	0.170***	0.109*	0.0253	0.128**	0.151**
	(0.0820)	(0.182)	(0.0708)	(0.0595)	(0.142)	(0.0508)	(0.0622)	(0.155)	(0.0528)	(0.0601)
$TA\_LP\_WEAK\_NS_{ijt}$	0.277*	0.0366	0.313**	0.347*	0.114	0.351**	0.320*	0.0755	0.325*	0.347*
	(0.149)	(0.196)	(0.143)	(0.178)	(0.179)	(0.164)	(0.192)	(0.192)	(0.177)	(0.178)
$TA\_LP\_STRONG\_NS_{ijt}$	0.0630	−0.0434	0.106	0.135**	0.0318	0.146**	0.138**	0.0407	0.151***	0.133**
	(0.0814)	(0.193)	(0.0792)	(0.0599)	(0.103)	(0.0621)	(0.0565)	(0.108)	(0.0563)	(0.0622)
$TA\_NO\_LP\_SN_{ijt}$	0.0643	0.287**	0.0486	0.105**	0.334***	0.0706	0.0752	0.316***	0.0340	0.106**
	(0.0732)	(0.121)	(0.0835)	(0.0489)	(0.0968)	(0.0572)	(0.0480)	(0.0966)	(0.0548)	(0.0491)
$TA\_LP\_WEAK\_SN_{ijt}$	0.0724	0.132	0.0816	0.139**	0.199	0.118**	0.0959*	0.181	0.0689	0.138**
	(0.0957)	(0.187)	(0.102)	(0.0568)	(0.146)	(0.0598)	(0.0547)	(0.137)	(0.0584)	(0.0577)
$TA\_LP\_STRONG\_SN_{ijt}$	−0.246**	−0.148	−0.198	−0.176**	−0.0769	−0.159*	−0.202***	−0.0828	−0.188**	−0.177**
	(0.112)	(0.168)	(0.123)	(0.0775)	(0.115)	(0.0893)	(0.0749)	(0.108)	(0.0892)	(0.0770)
$TA\_NO\_LP\_SS_{ijt}$	−0.0791	−0.338	0.00319	−0.0488	−0.309	0.0198	−0.108	−0.367*	−0.0385	−0.0479
	(0.152)	(0.255)	(0.116)	(0.140)	(0.217)	(0.111)	(0.141)	(0.219)	(0.112)	(0.140)
$TA\_LP\_WEAK\_SS_{ijt}$	0.294***	0.0948	0.349***	0.342***	0.150***	0.376***	0.279***	0.138***	0.306***	0.342***
	(0.0875)	(0.125)	(0.103)	(0.0735)	(0.0461)	(0.0913)	(0.0701)	(0.0434)	(0.0871)	(0.0739)
$TA\_LP\_STRONG\_SS_{ijt}$	0.220**	−0.214	0.414***	0.264***	−0.166*	0.439***	0.265***	−0.162**	0.452***	0.263***
	(0.100)	(0.152)	(0.111)	(0.0849)	(0.0923)	(0.104)	(0.0784)	(0.0809)	(0.0951)	(0.0860)
$DEPTH_{ijt}$	0.0783	0.0881	0.0426							
	(0.0822)	(0.150)	(0.0809)							
WTO_{ijt}				0.0703	0.0842	0.0732				
				(0.123)	(0.134)	(0.128)				
$TARIFF_{ijt}$							−3.592***	−1.876	−3.938***	
							(1.270)	(1.447)	(1.320)	
$TA\_LP\_STRONG\_NN\_noEU_{ijt}$										−0.00352
										(0.0749)

		Distance trend			International border*year			Dist. tr. + int. bord.*year		
		5			6			7		
(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.
0.106	0.124	0.0554	−0.0505	0.0485	0.0987	0.0375	0.0848	0.0797	−0.0204	0.0737
(0.0872)	(0.0791)	(0.0942)	(0.119)	(0.102)	(0.0800)	(0.0958)	(0.0904)	(0.0942)	(0.126)	(0.104)
0.109**	−0.00908	−0.103**	−0.118	−0.109**	−0.0495	−0.00470	−0.0616	−0.0734*	−0.0669	−0.0787*
(0.0475)	(0.0347)	(0.0496)	(0.127)	(0.0542)	(0.0444)	(0.0720)	(0.0491)	(0.0400)	(0.110)	(0.0450)
		0.187***	0.0347	0.229***	0.132**	−0.0213	0.173**	0.141**	−0.000631	0.177**
		(0.0711)	(0.0582)	(0.0769)	(0.0666)	(0.0550)	(0.0714)	(0.0684)	(0.0569)	(0.0739)
0.0400	0.172***	0.0980	−0.0817	0.127**	0.0993	−0.0612	0.126**	0.0943	−0.0857	0.123**
(0.144)	(0.0516)	(0.0635)	(0.149)	(0.0515)	(0.0716)	(0.150)	(0.0619)	(0.0717)	(0.155)	(0.0611)
0.114	0.351**	0.287	−0.0377	0.300*	0.311	0.00924	0.320*	0.303	−0.0277	0.315*
(0.179)	(0.164)	(0.208)	(0.159)	(0.175)	(0.189)	(0.178)	(0.174)	(0.193)	(0.167)	(0.179)
0.0311	0.143**	0.108	0.0164	0.120	0.124*	0.0269	0.136*	0.121	0.0253	0.135
(0.103)	(0.0642)	(0.0811)	(0.111)	(0.0797)	(0.0750)	(0.109)	(0.0737)	(0.0897)	(0.115)	(0.0901)
0.335***	0.0711	0.0412	0.279***	0.00621	0.0421	0.291***	0.00389	0.0344	0.280**	−0.00134
(0.0969)	(0.0566)	(0.0545)	(0.0975)	(0.0653)	(0.0561)	(0.111)	(0.0645)	(0.0622)	(0.112)	(0.0701)
0.199	0.117**	0.0614	0.121	0.0440	0.0714	0.144	0.0497	0.0546	0.123	0.0358
(0.146)	(0.0591)	(0.0669)	(0.147)	(0.0777)	(0.0613)	(0.134)	(0.0683)	(0.0723)	(0.143)	(0.0747)
−0.0776	−0.159*	−0.223**	−0.176	−0.205	−0.194**	−0.111	−0.178*	−0.214**	−0.161	−0.193
(0.114)	(0.0892)	(0.104)	(0.122)	(0.127)	(0.0783)	(0.106)	(0.0913)	(0.107)	(0.130)	(0.131)
−0.308	0.0208	−0.0677	−0.310	−0.00855	−0.0711	−0.324	−0.00665	−0.0859	−0.324	−0.0282
(0.218)	(0.111)	(0.137)	(0.232)	(0.117)	(0.129)	(0.205)	(0.103)	(0.146)	(0.227)	(0.127)
0.151***	0.376***	0.275***	0.0858	0.312***	0.289***	0.0875	0.321***	0.279***	0.0748	0.316***
(0.0461)	(0.0912)	(0.0739)	(0.0676)	(0.0914)	(0.0852)	(0.0608)	(0.0983)	(0.0953)	(0.0750)	(0.108)
−0.166*	0.437***	0.0255	−0.240	0.0844	0.199***	−0.255***	0.376***	0.00473	−0.239	0.0608
(0.0925)	(0.106)	(0.209)	(0.252)	(0.215)	(0.0711)	(0.0949)	(0.0866)	(0.226)	(0.244)	(0.235)
−0.0104	−0.00918									
(0.118)	(0.0806)									

(Continues)

TABLE 2 (Continued)

Variables	Depth			WTO membership			Tariffs			EU effect
	1			2			3			4
	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.
EU_{ijt}										0.248***
										(0.0757)
Exporter-time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Importer-time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Dir. pair FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Distance*year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Intl. brdr.*year	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations	669,633	587,744	656,783	669,633	587,744	656,783	473,677	427,221	466,729	669,633

Notes: Poisson regressions. Dependent variable: bilateral exports. Fixed effects and constants are not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the exporter, importer and time level.

***$p < .01$, **$p < .05$, *$p < .1$.

5 | CONCLUSIONS

During the last decades, we have witnessed a proliferation of trade agreements incorporating specific provisions related to labour rights and working conditions. These agreements may have different economic consequences than the rest. Indeed, trade agreements with labour provisions may affect the 'institutional comparative advantage' (Nunn & Trefler, 2014) of (labour abundant) countries. Due to the increasing relevance of bilateral (rather than WTO-wide) trade integration, this can have important repercussions on the evolution of global trade flows and economic interconnections.

Our paper contributes to this literature by testing empirically the effect of trade agreements with labour provisions on bilateral trade flows. We allow for heterogeneous effects depending on the level of enforceability of labour provisions (weak vs. strong provisions), sector (labour vs. non-labour-intensive goods), level of development (North vs. South) and combinations of the three dimensions. We do so by implementing a state-of-the-art structural gravity model with domestic trade.

In line with previous research, our results show that, on average, trade agreements with labour provisions have larger (positive) effects on aggregate bilateral manufacturing trade flows, with respect to trade agreements without them. However, our novel contribution is to uncover an important degree of heterogeneity both at the sector and members' development level. Importantly, we show that while exports from the South to the North display a significant increase after a signature of a trade agreements with no or nonenforceable labour provisions, this is not the case if strong labour provisions are included in the agreement. Such difference tends to be larger for labour-intensive goods.

		Distance trend			International border*year			Dist. tr. + int. bord.*year		
		5			6			7		
(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.	(a) Tot. manuf.	(b) Lab. int. manuf.	(c) Non-lab. int. manuf.
0.0765	0.298***									
(0.0665)	(0.0796)									
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES
NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
587,744	656,783	607,491	538,660	596,919	669,633	587,744	656,783	607,491	538,660	596,919

This represents an important contribution on the consequences of trade agreements with labour provisions on South-North trade relations, above and beyond those on other nontariff measures (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, on one hand, the signing of a trade agreement without labour provisions with an importer in the North implies large, positive and significant effects on its exports, particularly of labour-intensive goods. On the other hand, if the same trade agreement includes strong labour provisions, this is likely to have no positive effect on South-North exports.

In terms of venues for further research, the effect of trade agreements with labour provisions should be investigated more in 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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DATA AVAILABILITY STATEMENT

All data used are from publicly available sources. All necessary details are included in the main text.

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APPENDIX

As stated in Section 4.2, our sector-level regressions (see Table A.3) support the findings of a larger effect of trade agreements without labour provisions on exports from the South to the North with respect to that of trade agreements with strong labour provisions, and especially so for labour-intensive sectors.

Figures A.2 and A.3 provide two visual summaries of the information contained in Table A.3 for South-North trade agreements. In both figures, we associate the sector-level capital intensity (capital per employee) with the effects of trade agreements with and without labour provisions on trade.

More in detail, in Figure A.2, we compare the distributions of the interquartile ranges of sector-level factor intensity for three mutually exclusive groups of South-North trade agreement effects.[19] The first group, labelled 'Group 1', contains sectors where the effect of trade agreements without labour provisions are 'stronger' than those of trade agreements with strong labour provisions. The second group, labelled 'Group 2', contains sectors where the effects are 'similar'. The third group, labelled 'Group 3', contains sectors where the effect of trade agreements without labour provisions is 'weaker' than that of trade agreement with strong labour provisions.

More precisely, 'Group 1' includes those sectors where the *TA_noLP_SN* effect is positive and significant, and the *TA_STRONG_LP_SN* effect is either not statically significant or negative and significant. It also includes sectors where the *TA_noLP_SN* effect is not statistically significant and the *TA_STRONG_LP_SN* effect is negative and significant. 'Group 2' includes those sectors where the *TA_noLP_SN* and *TA_STRONG_LP_SN* are both positive and significant, both not statistically significant, or both negative and significant. 'Group 3' includes those sectors where the *TA_STRONG_LP_SN* effect is positive and significant, and the *TA_noLP_SN* effect is either not statically significant or negative and significant. It also includes sectors where the *TA_STRONG_LP_SN* effect is not statistically significant, and the *TA_noLP_SN* effect is negative and significant. The advantages of this classification lie on its mutually exclusive categories and on its computational ease, as the categories can be directly and manually calculated from Table A.3.

Sector-level factor intensity is computed following Bustos (2011): we build a measure of factor intensity for each two-digit ISIC industry using the NBER-CES Manufacturing Industry Database that correspond to the capital-to-labour ratio.[20] Therefore, the lower the number, the lower the capital intensity (and the higher the labour intensity), and vice versa. We take 1995 as reference year for calculations.[21]

[19]The box plot reported in Figure A.2 shows the distribution of factor intensity for each group defined as in the text. For each group, the graph shows the median (the line within the box), the 25th and 75th percentile range (the limits of the box), and the upper and lower adjacent values (lines emerging from the box, above and below respectively).

[20]The NBER-CES Manufacturing Industry Database provides data on the real capital stock in millions of 1987 dollars ("CAP" variable in the database) and number of employees ("EMP" variable in the database) per industry. As in Bustos (2011), factor intensity is then calculated CAP/EMP.

[21]We can assume that 1995 values are plausibly exogenous, as our sample starts only five years later, in 2000.

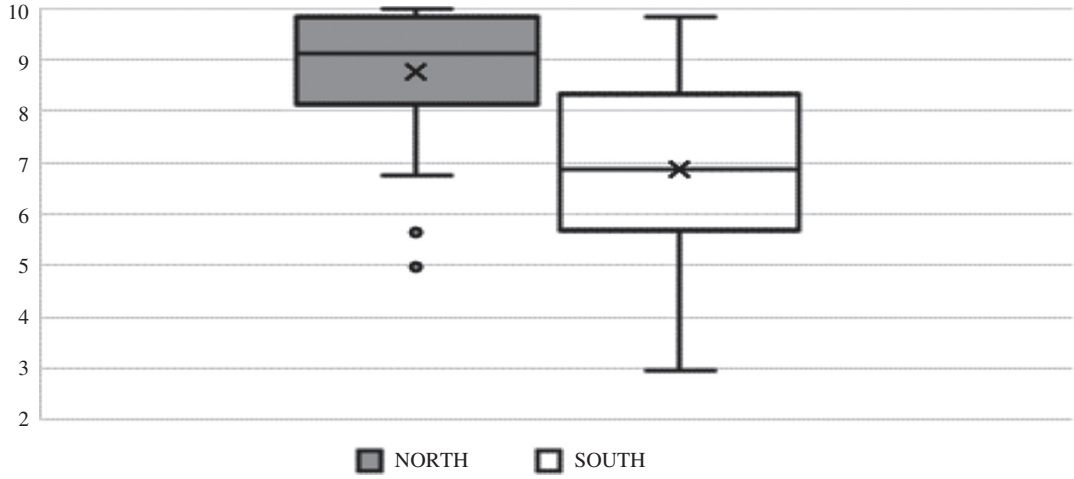

FIGURE A1 Labor rights in the North and in the South

Note: The figure shows the Kucera and Sari (2019) synthetic indicator for freedom of association and collective bargaining rights in law and practice for the year 2000 (the first year of our sample). Importantly, the original indicator has an inverse relationship with the level of labor rights: it ranges between 0 and 10, being 0 the best score and 10 the worst score. We linearly transform the index to have a direct relationship between labor rights and the indicator level (best score: 10; worst score: 0). See http://labor-rights-indicators.la.psu.edu/about for more details on the index. North and South are defined as in the text.

Source: Authors' elaboration on Kucera and Sari (2019).

TABLE A1 Summary statistics

Variable	Observations	Mean	Std. dev.	Min	Max
Exports (aggregate)	672,791	547.72	25620.88	0	9214964
Exports (lab. Int.)	672,791	63.72	2931.12	0	1001829
Exports (non-lab. Int.)	672,791	483.99	22769.96	0	8213136
TA_{ijt}	672,791	0.096	0.294	0	1
$TA\_NO\_LP_{ijt}$	672,791	0.059	0.236	0	1
TA_LP_{ijt}	672,791	0.036	0.187	0	1
$TA\_LP\_WEAK_{ijt}$	672,791	0.009	0.095	0	1
$TA\_LP\_STRONG_{ijt}$	672,791	0.027	0.163	0	1
$TA\_NO\_LP\_NN_{ijt}$	672,791	0.0017	0.041	0	1
$TA\_LP\_WEAK\_NN_{ijt}$	672,791	0.0004	0.020	0	1
$TA\_LP\_STRONG\_NN_{ijt}$	672,791	0.0162	0.126	0	1
$TA\_NO\_LP\_NS_{ijt}$	672,791	0.0122	0.110	0	1
$TA\_LP\_WEAK\_NS_{ijt}$	672,791	0.0011	0.034	0	1
$TA\_LP\_STRONG\_NS_{ijt}$	672,791	0.0045	0.065	0	1
$TA\_NO\_LP\_SN_{ijt}$	672,791	0.0122	0.110	0	1
$TA\_LP\_WEAK\_SN_{ijt}$	672,791	0.0011	0.034	0	1
$TA\_LP\_STRONG\_SN_{ijt}$	672,791	0.0044	0.066	0	1
$TA\_NO\_LP\_SS_{ijt}$	672,791	0.0332	0.179	0	1
$TA\_LP\_WEAK\_SS_{ijt}$	672,791	0.0063	0.079	0	1
$TA\_LP\_STRONG\_SS_{ijt}$	672,791	0.0022	0.047	0	1

TABLE A2 List of labour-intensive goods (as in Busse, 2002)

Commodity	SITC code	ISIC code (correspondence)
Fabric and textile yearn	65	1711; 1721; 1722; 1723; 1729; 1730; 1810; 2109; 2430; 2519; 2610; 3699
Glassware, glass and pottery	664–666	2610; 2691
Bedding and furniture	82	1721; 3610
Handbags and travel goods	83	1912
Apparel	84	1730; 1810; 1820; 2519; 2520
Footwear	85	1920
Games, toys, baby carriages and sporting goods	894	3693; 3694; 3699

Notes: We use the conversion tables available from Eurostat to translate SITC codes in ISIC. Importantly, the classification by Busse (2002) is based on three-digit SITC codes. In most of the cases, a three-digit SITC code can be univocally linked to a single four-digit ISIC code. When this is not possible (roughly 25% of the codes used in the Busse classification), the most frequent four-digit ISIC code is used.

Source: Authors' elaboration on Busse (2002).

Figure A.2 then provides a simple graphical representation of the association between capital intensity and the South-North trade agreement effects, showing that 'Group 1' effects tend to be associated with industries with higher level of labour intensity (i.e. lower level of capital intensity), such as, for example, manufacturing of textiles, wearing apparel, luggage and footwear, or leather-related industries. 'Group 3' effects tend to be associated with industries with lower level of labour intensity (i.e. higher level of capital intensity), such as, for example, manufacturing of chemical products. 'Group 2' effects are associated with industries whose labour intensity lies somewhat in the middle.

In Figure A.3, we compare the distributions of the interquartile ranges of trade agreement coefficients from sector regressions divided by quartiles of sector capital intensity.[22] Figure A.3 shows two important features in support of our main findings. First, the relation between the distribution of coefficients and the capital intensity within the same type of agreement. In the case of trade agreements without labour provisions (Figure A.3a), the median effect is decreasing with capital intensity. In other words, the effects of these treaties tend to be larger in sectors with higher labour intensity (lower capital intensity). In the case of trade agreements with strong labour provisions (Figure A.3c), the relationship is increasing: the effects of these treaties tend to be larger in sectors with lower labour intensity (higher capital intensity). In the case of trade agreements with weak labour provisions (Figure A.3b), the relation is similar to that of trade agreements without labour provisions; however, the pattern is fuzzier.

Second, the relation between the distribution of coefficients in the same quartile of capital intensity across different type of agreements. The effects of trade agreements for sectors in the first quartile of the distribution of capital intensity, i.e. more labour-intensive sectors, tend to

[22]The box plot reported in Figure A.3 shows the distribution of coefficients for each type of trade agreements: 3.a shows the coefficients relative to trade agreements without labor provisions; 3.b shows the coefficients relative to trade agreements with "weak" labor provisions; 3.c shows the coefficients relative to trade agreements with "strong" labor provisions. For each group, the graph shows the median (the line within the box), the 25th and 75th percentile range (the limits of the box), and the upper and lower adjacent values (lines emerging from the box, above and below respectively).

be higher for trade agreements without labour provisions, and lower for trade agreements with strong labour provisions. As expected, the opposite is true for sectors in the third quartile of the distribution of capital intensity, i.e. more capital intensive sectors.

There is one exception to what we discussed above, the effects of trade agreements for sectors in the fourth quartile of the distribution of capital intensity, i.e. the group including the most capital intensive sectors. For sectors with very high capital intensity, the median effect of any

TABLE A3 Trade agreements with labour provisions and trade flows, two-digit ISIC

	1	2	3	4	5
	ISIC sector 15	ISIC sector 16	ISIC sector 17	ISIC sector 18	ISIC sector 19
Variables	Manuf. of food products and beverages	Manuf. of tobacco products	Manuf. of textiles	Manuf. of wearing apparel; dressing and dyeing of fur	Tanning and dressing of leather; manuf. of luggage, handbags, saddlery, harness and footwear
$TA\_NO\_LP\_NN_{ijt}$	0.127**	1.893***	0.146	0.240	−0.0703
	(0.0500)	(0.182)	(0.137)	(0.211)	(0.216)
$TA\_LP\_WEAK\_NN_{ijt}$	0.0994**	0.143	0.0727	−0.335*	0.324***
	(0.0463)	(0.164)	(0.103)	(0.197)	(0.0958)
$TA\_LP\_STRONG\_NN_{ijt}$	0.608***	1.721***	0.100	−0.0702	−0.0834
	(0.134)	(0.344)	(0.110)	(0.173)	(0.175)
$TA\_NO\_LP\_NS_{ijt}$	−0.0887	0.482**	0.181	−0.772**	−0.348
	(0.0730)	(0.237)	(0.168)	(0.340)	(0.269)
$TA\_LP\_WEAK\_NS_{ijt}$	0.197**	0.0491	0.130	0.390	0.185
	(0.0873)	(0.172)	(0.190)	(0.469)	(0.240)
$TA\_LP\_STRONG\_NS_{ijt}$	0.140	−0.412*	0.195	−0.0742	0.0166
	(0.123)	(0.236)	(0.151)	(0.290)	(0.116)
$TA\_NO\_LP\_SN_{ijt}$	0.119	0.414	0.322*	0.610***	0.322***
	(0.0731)	(0.312)	(0.182)	(0.197)	(0.109)
$TA\_LP\_WEAK\_SN_{ijt}$	0.216***	0.264	0.181	0.276	0.319
	(0.0606)	(0.440)	(0.149)	(0.182)	(0.212)
$TA\_LP\_STRONG\_SN_{ijt}$	0.0640	−0.0175	−0.0803	−0.129	0.303***
	(0.0865)	(0.203)	(0.181)	(0.136)	(0.104)
$TA\_NO\_LP\_SS_{ijt}$	0.133	0.383	−0.208	−0.739**	−0.796***
	(0.0966)	(0.282)	(0.163)	(0.327)	(0.296)

type of trade agreement (without, with weak and with strong labour provisions) is very close to zero. This finding can be rationalised recalling the (very) limited importance (and international competitiveness) of very high capital intensive sectors in emerging and developing economies. Therefore, for such sectors, the change in the 'institutional comparative advantage' granted by a trade agreement would not be enough to guarantee significant changes in exports.2010

6	7	8	9	10	11
ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector
20	21	22	23	24	25
Manuf. of wood and of products of wood and cork, except furniture; manuf. of articles of straw and plaiting materials	Manuf. of paper and paper products	Publishing, printing and reprod. of recorded media	Manuf. of coke, refined petroleum products and nuclear fuel	Manuf. of chemicals and chemical products	Manuf. of rubber and plastics products
−0.214	−0.408	−0.0473	0.385**	0.245***	−0.0119
(0.208)	(0.259)	(0.135)	(0.152)	(0.0578)	(0.0536)
−0.0155	0.0624	0.142	0.624***	0.0872	0.122
(0.121)	(0.137)	(0.0944)	(0.111)	(0.106)	(0.0800)
0.127*	0.174**	0.0840	0.196	0.347**	0.243**
(0.0756)	(0.0846)	(0.160)	(0.137)	(0.141)	(0.105)
0.197	0.0108	−0.00430	0.472***	0.146*	0.121
(0.136)	(0.0698)	(0.102)	(0.100)	(0.0813)	(0.0772)
−0.266	0.0172	−0.0755	0.353	0.104	0.0793
(0.218)	(0.128)	(0.183)	(0.217)	(0.122)	(0.0707)
0.0290	0.189*	0.000218	0.301	−0.0638	0.183**
(0.148)	(0.102)	(0.100)	(0.198)	(0.0795)	(0.0851)
0.268**	0.0511	−0.134	0.115	0.139	0.207***
(0.119)	(0.0679)	(0.144)	(0.114)	(0.0905)	(0.0647)
0.555***	0.0334	−0.0366	0.0123	0.150	0.235***
(0.117)	(0.127)	(0.142)	(0.170)	(0.0964)	(0.0599)
0.192*	0.201*	−0.217**	−0.609***	0.160**	0.487**
(0.115)	(0.119)	(0.0848)	(0.145)	(0.0641)	(0.207)
−0.299*	−0.159	−0.152*	−0.00757	0.0920	−0.0357
(0.153)	(0.147)	(0.0907)	(0.0731)	(0.0780)	(0.199)

(Continues)

TABLE A3 (Continued)

Variables	1 ISIC sector 15 Manuf. of food products and beverages	2 ISIC sector 16 Manuf. of tobacco products	3 ISIC sector 17 Manuf. of textiles	4 ISIC sector 18 Manuf. of wearing apparel; dressing and dyeing of fur	5 ISIC sector 19 Tanning and dressing of leather; manuf. of luggage, handbags, saddlery, harness and footwear
$TA\_LP\_WEAK\_SS_{ijt}$	−0.149	−0.136	0.208***	−0.0319	0.221**
	(0.187)	(0.368)	(0.0790)	(0.0957)	(0.0869)
$TA\_LP\_STRONG\_SS_{ijt}$	0.562***	1.117***	0.0343	−0.770***	−0.426***
	(0.151)	(0.417)	(0.156)	(0.254)	(0.143)
Exporter-time FE	YES	YES	YES	YES	YES
Importer-time FE	YES	YES	YES	YES	YES
Dir. pair FE	YES	YES	YES	YES	YES
Observations	497,868	217,084	473,186	470,725	404,975

Variables	ISIC sector 26 Manuf. of other non-metallic mineral products	ISIC sector 27 Manuf. of basic metals	ISIC sector 28 Manuf. of fabricated metal products, except machinery and equipment	ISIC sector 29 Manuf. of machinery and equipment n.e.c.
$TA\_NO\_LP\_NN_{ijt}$	0.559***	0.0297	0.369	0.177
	(0.163)	(0.113)	(0.317)	(0.121)
$TA\_LP\_WEAK\_NN_{ijt}$	0.0793	0.151	0.316***	0.157***
	(0.0714)	(0.236)	(0.0577)	(0.0457)
$TA\_LP\_STRONG\_NN_{ijt}$	0.186**	0.358***	0.331***	0.0835
	(0.0878)	(0.0945)	(0.0790)	(0.138)
$TA\_NO\_LP\_NS_{ijt}$	0.0263	0.508	0.0303	0.0542
	(0.112)	(0.337)	(0.0575)	(0.0616)

6	7	8	9	10	11
ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector
20	21	22	23	24	25
Manuf. of wood and of products of wood and cork, except furniture; manuf. of articles of straw and plaiting materials	Manuf. of paper and paper products	Publishing, printing and reprod. of recorded media	Manuf. of coke, refined petroleum products and nuclear fuel	Manuf. of chemicals and chemical products	Manuf. of rubber and plastics products
0.415**	0.157*	−0.154	0.405	0.0159	0.118
(0.204)	(0.0849)	(0.196)	(0.418)	(0.0730)	(0.101)
−0.0360	0.0580	0.173	0.197	0.544***	0.346***
(0.0520)	(0.162)	(0.159)	(0.165)	(0.156)	(0.111)
YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES
364,900	386,290	418,931	298,311	504,961	477,843

ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector	ISIC sector
30	31	32	33	34	35	36
Manuf. of office, accounting and computing machinery	Manuf. of electrical machinery and apparatus n.e.c.	Manuf. of radio, television and comm. equipment and apparatus	Manuf. of medical, precision and optical instr., watches and clocks	Manuf. of motor vehicles, trailers and semi-trailers	Manuf. of other transport equipment	Manuf. of furniture; manuf. n.e.c.
−0.0877	0.492**	−0.326*	−0.0907	−0.0807	0.416**	0.755**
(0.174)	(0.232)	(0.169)	(0.118)	(0.0574)	(0.165)	(0.382)
0.0763	0.144	−0.457***	0.0796	0.242*	0.138	−0.258**
(0.140)	(0.129)	(0.0748)	(0.200)	(0.147)	(0.141)	(0.121)
0.370**	0.216	0.0680	0.293**	0.00403	−0.261	0.470***
(0.158)	(0.139)	(0.130)	(0.125)	(0.145)	(0.168)	(0.126)
−0.115	0.0406	0.00975	0.0799	0.173	−0.189	0.238
(0.1000)	(0.0781)	(0.0532)	(0.0750)	(0.126)	(0.167)	(0.202)

TABLE A3 (Continued)

Variables	ISIC sector 26 Manuf. of other non-metallic mineral products	ISIC sector 27 Manuf. of basic metals	ISIC sector 28 Manuf. of fabricated metal products, except machinery and equipment	ISIC sector 29 Manuf. of machinery and equipment n.e.c.
$TA\_LP\_WEAK\_NS_{ijt}$	−0.0555	0.669***	0.125	−0.000141
	(0.0931)	(0.126)	(0.0911)	(0.0470)
$TA\_LP\_STRONG\_NS_{ijt}$	−0.142**	0.0835	0.149	0.0608
	(0.0701)	(0.0637)	(0.0944)	(0.0660)
$TA\_NO\_LP\_SN_{ijt}$	0.147	0.0984	0.304**	0.136**
	(0.109)	(0.0927)	(0.124)	(0.0540)
$TA\_LP\_WEAK\_SN_{ijt}$	−0.0407	0.571***	0.243*	0.201*
	(0.150)	(0.157)	(0.144)	(0.113)
$TA\_LP\_STRONG\_SN_{ijt}$	−0.263*	−0.0115	0.331***	0.479***
	(0.146)	(0.166)	(0.110)	(0.129)
$TA\_NO\_LP\_SS_{ijt}$	−0.0896	0.0740	−0.0445	−0.0747
	(0.150)	(0.0941)	(0.141)	(0.131)
$TA\_LP\_WEAK\_SS_{ijt}$	0.0286	0.724***	0.191**	0.120**
	(0.0818)	(0.206)	(0.0795)	(0.0544)
$TA\_LP\_STRONG\_SS_{ijt}$	−0.201*	0.468***	0.160	0.326***
	(0.112)	(0.116)	(0.120)	(0.111)
Exporter-time FE	YES	YES	YES	YES
Importer-time FE	YES	YES	YES	YES
Dir. pair FE	YES	YES	YES	YES
Observations	408,929	385,949	482,820	514,455

ISIC sector 30 Manuf. of office, accounting and computing machinery	ISIC sector 31 Manuf. of electrical machinery and apparatus n.e.c.	ISIC sector 32 Manuf. of radio, television and comm. equipment and apparatus	ISIC sector 33 Manuf. of medical, precision and optical instr., watches and clocks	ISIC sector 34 Manuf. of motor vehicles, trailers and semi-trailers	ISIC sector 35 Manuf. of other transport equipment	ISIC sector 36 Manuf. of furniture; manuf. n.e.c.
−0.444**	−0.119	0.0765	0.257***	−0.0153	−0.426**	0.672***
(0.199)	(0.173)	(0.202)	(0.0564)	(0.0831)	(0.202)	(0.213)
0.468***	0.272**	0.191*	0.0975	0.172*	−0.296	−0.117
(0.149)	(0.126)	(0.107)	(0.0701)	(0.0956)	(0.193)	(0.125)
−0.118	0.0753	−0.178*	0.121*	0.128	0.289*	0.0338
(0.160)	(0.105)	(0.0998)	(0.0667)	(0.128)	(0.166)	(0.0884)
−0.0688	0.0676	−0.305**	0.365**	0.00737	0.432*	0.219*
(0.214)	(0.125)	(0.138)	(0.168)	(0.117)	(0.256)	(0.122)
−0.314***	0.444***	0.0435	−0.197	0.543***	−0.0557	0.137
(0.0684)	(0.158)	(0.280)	(0.133)	(0.168)	(0.404)	(0.193)
−0.359**	−0.143	0.0544	−0.273**	0.348***	0.0844	−0.721**
(0.162)	(0.129)	(0.171)	(0.117)	(0.133)	(0.250)	(0.316)
0.312***	0.207**	0.325*	−0.0680	0.706***	−0.130	−0.0214
(0.0961)	(0.102)	(0.193)	(0.0815)	(0.180)	(0.283)	(0.0914)
1.010*	0.394***	0.936***	0.673**	0.706***	0.294***	0.276
(0.561)	(0.115)	(0.268)	(0.342)	(0.122)	(0.106)	(0.194)
YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES
417,367	480,005	453,422	445,665	452,194	352,221	475,656

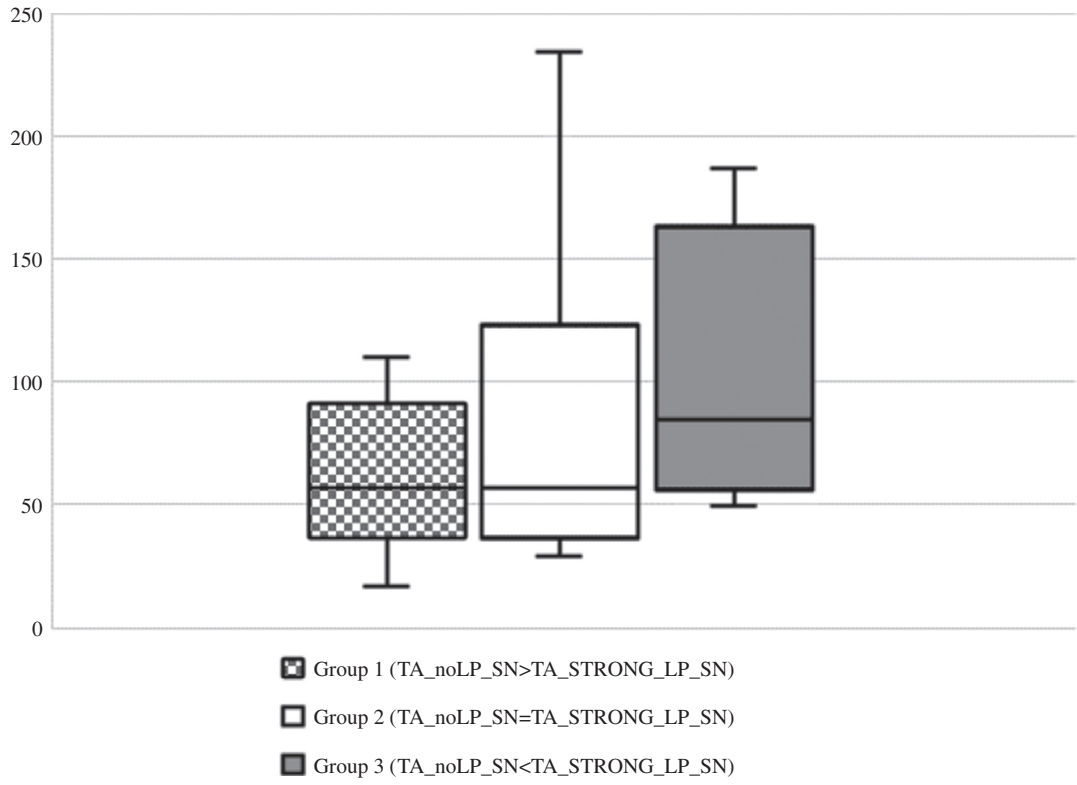

FIGURE A2 Association between capital intensity and South-North trade agreement effects

Note: 'Group 1' includes those sectors where the *TA_noLP_SN* effect is positive and significant, and the *TA_STRONG_LP_SN* effect is either not statically significant or negative and significant. It also includes sectors where the *TA_noLP_SN* effect is not statistically significant, and the *TA_STRONG_LP_SN* effect is negative and significant. 'Group 2' includes those sectors where the *TA_noLP_SN* and *TA_STRONG_LP_SN* are both positive and significant, both not statistically significant, or both negative and significant. 'Group 3' includes those sectors where the *TA_STRONG_LP_SN* effect is positive and significant, and the *TA_noLP_SN* effect is either not statically significant or negative and significant. It also includes sectors where the *TA_STRONG_LP_SN* effect is not statistically significant and the *TA_noLP_SN* effect is negative and significant. ISIC sector 23, 'manufacture of coke, refined petroleum products and nuclear fuel', is excluded. Capital intensity is calculated as capital per employee. See text for further details

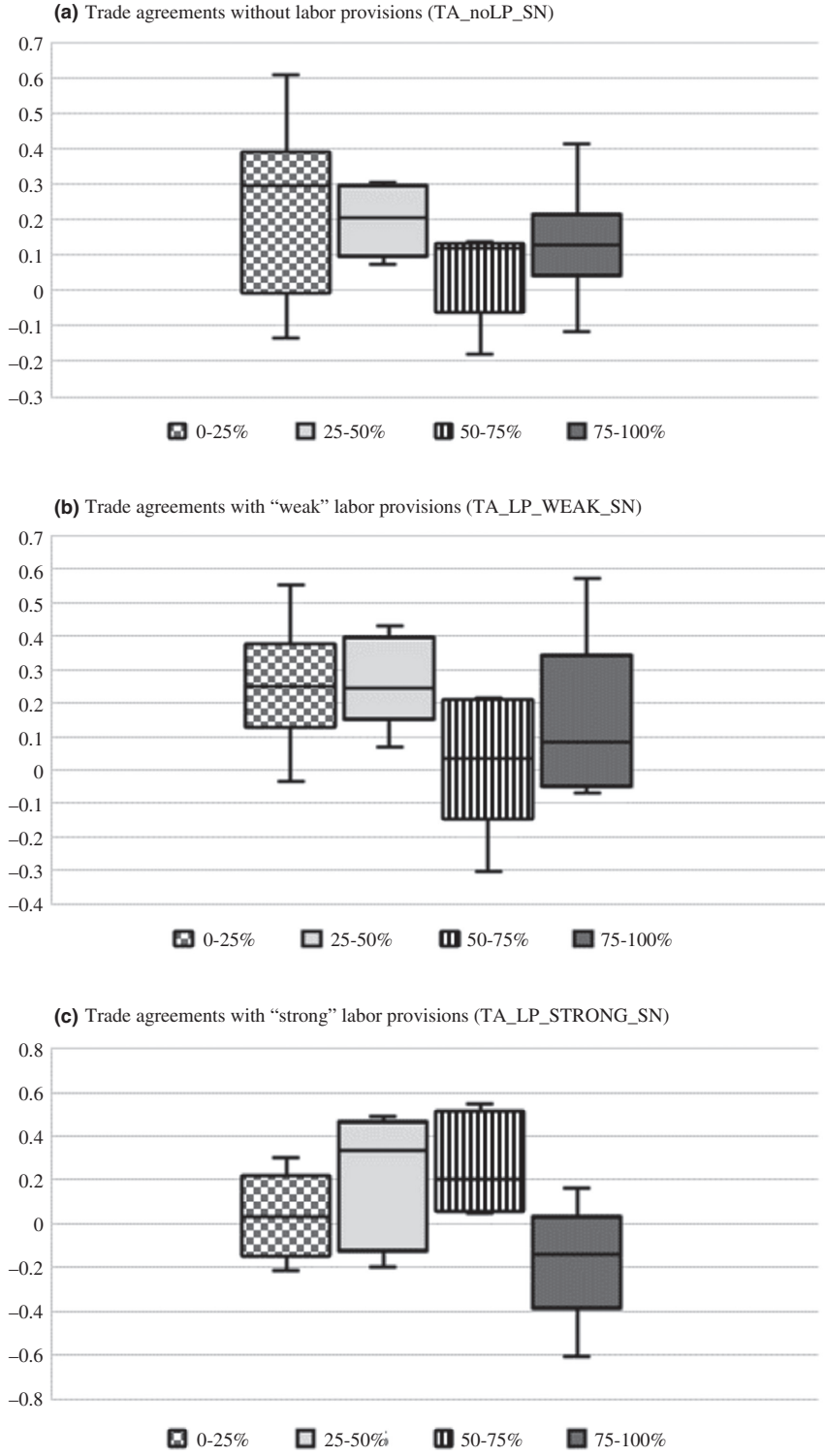

FIGURE A3 Association between South-North trade agreement coefficients and capital intensity. (a) Trade agreements without labour provisions (*TA_noLP_SN*). (b) Trade agreements with 'weak' labour provisions (*TA_LP_WEAK_SN*). (c) Trade agreements with 'strong' labour provisions (*TA_LP_STRONG_SN*)