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Do Labor Clauses in Regional Trade Agreements Reduce the Trade Creation Effect?*

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Abstract

We empirically test the hypothesis that labor clauses (LCs) in regional trade agreements (RTAs) reduce the trade creation effect of RTAs. We estimate a structural gravity model using a panel of bilateral trade data for the sample of 190 countries/regions for the 25-year period of 1990–2014. Using the Poisson pseudo-maximum likelihood estimator, we find that legally enforceable LCs are likely to enhance the trade creation effect of RTAs, whereas legally unenforceable LCs could reduce it, on average. We also find that these impacts of LCs on the RTAs' trade creation effect are heterogeneous among the types of country pairs: the positive impact of legally enforceable LCs is significant for trade between developed countries but insignificant for trade between developing countries; and the impact of legally unenforceable LCs is significantly negative for trade between developed countries, although it is rather positive for trade to developing importers. Moreover, we find that, when we deal with the endogeneity issue, the estimated impacts of LCs become insignificant, suggesting that countries may selectively decide whether they include LCs in the negotiated RTAs considering their potential impacts on trade with the RTA partners.

Keywords: labor clause; legal enforceability; regional trade agreement; trade creation effect; structural gravity model.

JEL classification: F14; F15; F16.

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1 Introduction

Trade agreements today are not just about trade in goods but cover other trade-related matters (and sometimes even trade-*un*related ones) both in the multilateral and regional contexts. In the multilateral context, the World Trade Organization (WTO) system, unlike the former General Agreement on Tariffs and Trade (GATT) system, deals with trade in services, intellectual properties, trade-related investment measures and so on, in addition to traditional trade in goods. Some of regional trade agreements (RTAs) go beyond them and deal with the signatories' domestic policy topics. For instance, some RTAs have "social clauses," i.e., provisions that require or expect the signatory governments to maintain a certain level of domestic labor or environmental standards or conditions. Focusing on provisions on labor conditions, which is the interest of the current paper, the number of RTAs with labor provisions has been increasing as more and more RTAs has been signed and in force (see Figure 1) . One of motives for those labor provisions in RTAs is a concern about potential "race to the bottoms" due to trade competition, and such concern should typically be stronger in developed countries that are facing import competitions in labor-intensive industries from countries with lower labor costs.

(Insert Figure 1 around here.)

The primary goal of providing labor clauses (LCs) in a RTA should be to prevent deterioration in, or even improve, the signatories' domestic labor standards or conditions. However, labor provisions could have side effects on trade liberalization or trade promotion between RTA partners, which is the main purpose of the RTA. For instance, RTA labor provisions will impose on a negotiating government a policy burden by urging it to commit to adjusting its domestic policy. The burden may be larger when the government is expected to harmonize its domestic labor conditions with the RTA partner that has higher labor standards than it. The government might then be conservative in giving the partner access to its market and try not to lower tariffs or other import barriers much against the RTA partner. If this were the case, the degree of trade liberalization resulted in the RTA and expected trade creation effect of the RTA might be smaller compared to the possibility in which the RTA did not have labor provisions. Other possibility may also be thought where the government gave more generous market access to its RTA partner in return for the partner's commitment to the extra policy burden especially when the country applies higher domestic labor standards than the partner's. In this case, the degree of resulted trade liberalization and expected trade creation effect of the RTA might be even larger compared to the case where the RTA was negotiated without labor provisions.[1]

The goal of this paper is to empirically investigate the potential impact of labor provisions in RTAs on the trade creation effect of the RTAs. Since two contrasting possibilities are considered as

[1] Limão (2005) provides a political-economic model and shows two policy issues will be strategic complement in some circumstances but strategic substitute in others when two issued are linked in an international policy agreement.

mentioned above, we attempt to estimate whether labor provisions have a positive or negative impact on a RTA's expected trade creation effect and resulted trade flows between the RTA partners, using aggregated data on trade and RTAs. Utilizing the data on a wide variety of RTAs and their contents that were originally constructed by Horn et al. (2010) and substantially extended by Hofmann et al. (2018), we estimate a structural gravity equation including indicator variables expressing whether or not an RTA includes legally enforceable or unenforceable LCs. Our empirical results, particularly of the estimation using the Poisson pseudo-maximum likelihood estimator with zero-trade observations, indicate that legally enforceable LCs are likely to enhance the trade creation effect of RTAs whereas legally unenforceable LCs could reduce it, on average. Moreover, we find that these impacts of LCs on RTA trade creation effect are heterogeneous among the types of country pairs. The positive impact of legally enforceable LCs is significant for trade between developed countries but not much for other trade, and is insignificant for trade between developing countries. The impact of legally unenforceable LCs is significantly negative for trade between developed countries, though it is rather positive for trade to developing importers. However, we also find that the endogeneity of LCs should matter: Once we instrument for the LC variables, the estimated impacts of LCs become insignificant. This result should imply the possibility in which countries selectively decide whether or not they include LCs in negotiated RTAs considering their potential impacts on trade with the RTA partners.

This paper should be a unique contribution to research on labor provisions in trade agreements. It has recently been commoner that RTAs involve labor provisions, and literature on the topic is growing especially in taxonomic studies (see, for instance, a comprehensive survey by the ILO (2016)). Yet, little has been investigated on the impacts of labor provisions in RTAs empirically or econometrically[2] except for several studies. Those include a series of studies by Kamata (2014, 2016, 2018) who has used his own classification of RTA labor provisions and has estimated the effects of the labor provisions on various measures of labor standards and conditions. They also include the work by Carrère et al. (2017) that examines the impact on bilateral trade flows of the inclusion of LCs in RTAs[3] using a unique dataset on LCs in RTAs (LABPTA dataset) constructed by Raess and Sari (2018). They find that the inclusion of LCs in RTAs does not have a statistically significant impact on bilateral trade flows on average. However, they also find that there is heterogeneity in the effects of LCs, and exports from low-income countries to high-income countries significantly increase when RTAs between those countries include LCs. Moreover, the impact is stronger when LCs are accompanied by deep cooperation mechanisms.

Our study is complementary to the study by Carrère et al. (2017) in the sense that we estimate the impact of LCs on the trade creation effect of RTAs. However, our analysis is not directly comparable

[2]This is contrast to rich empirical literature on trade and labor conditions.

[3]Kamata (2014) also attempts to estimate and compare the impacts of an RTA on trade between the RTA partners between when the RTA has labor clauses and when it does not.

to that by Carrère et al. (2017) because they restrict the sample to country pairs that have signed RTAs. Due to this sample restriction, they cannot estimate the trade creation effect of RTAs, and thus they cannot investigate how an RTA's trade creation effect is affected when the RTA includes LCs. To the best of our knowledge, this study is the first empirical work on the topic of the impacts of LCs on RTAs' trade creation effects. Moreover, this paper adds to literature on empirical studies on the trade creation effect of RTAs. A number of studies with a gravity-equation approach such as Baier and Bergstrand (2007) have found that RTAs contribute to promote trade between the signatory countries (see, for instance, a survey by Cipollina and Salvatici (2010)), and the current study also confirms this finding by estimating a positive impact of signing an RTA overall on trade flows between the signatories.

The rest of the paper is organized as follows. The next Section 2 explains the conceptual framework of our analysis. Section 3 briefly describes the data and their sources. Section 4 explains our empirical approach, and Section 5 presents the results of our estimation. The concluding Section 6 discusses issues to be further addresses.

2 Conceptual Framework

As is well known, the structural gravity model is theoretically founded (Anderson, 2011; Head and Mayer, 2014). A simple structural gravity model can be expressed as (Head and Mayer, 2014)

$$X_{ijt} = \frac{Y_{it}}{\Omega_{it}} \frac{E_{jt}}{\Phi_{jt}} \phi_{ijt}, \tag{1}$$

where X_{ijt} denotes exports from country i to country j at time t, Y_{it} is exporter i's total output at time t, E_{jt} is importer j's total expenditure at time t, and Ω_{it} and Φ_{jt} are respectively called *outward* and *inward* multilateral resistance terms (Anderson, 2011) and are defined as

$$\Omega_{it} = \sum_k \frac{\phi_{kit} E_{kt}}{\Phi_{kt}}, \qquad \Phi_{jt} = \sum_k \frac{\phi_{jkt} Y_{kt}}{\Omega_{kt}}.$$

Ω_{it} and Φ_{jt} measure the average seller's and buyer's incidence of trade costs (Anderson, 2011). Finally, in Eq. (1), ϕ_{ijt} measures bilateral accessibility of country j to exporter i. Trade costs and trade barriers are captured by ϕ_{ijt}.

If countries i and j are signatories of a common RTA, it is generally expected that trade between i and j is facilitated. This trade creation effect of RTA is usually measured by a dummy variable for RTA formation, which is part of ϕ_{ijt}. The primary interest of this paper is how the inclusion of LCs in RTAs alters the trade creation effect of RTAs. Thus, the impact of LCs is also captured by ϕ_{ijt}.

However, LCs in RTAs may also affect the exporter's capability and/or the importer's market characteristics, suggesting that Ω_{it} and Φ_{jt} may potentially be affected by LCs. Although this is an

important issue, we set it out of this paper's scope and focus on the effects of LCs through ϕ_{ijt} in Eq. (1).

3 Data

The data we use in this study are taken from various sources. First, bilateral trade data are taken from the United Nations Comtrade (UN Comtrade) database. We extract data on total export in manufacturing goods for a sample of 190 countries for the period 1990–2014. We restrict our sample to manufacturing goods using the concordance between 6-digit HS code in UN Comtrade database and 3-digit ISIC Rev.3.1 provided by the World Integrated Trade Solution (WITS) database at the World Bank. We categorize goods in Section D in ISIC Rev.3.1 (Group 151–369) into manufacturing goods.

In the gravity literature, the importance of including intra-national trade flows (i.e., domestic sales) is well recognized in estimating the effect of RTAs (Bergstrand et al., 2015; Dai et al., 2014; Yotov, 2012). We use the gross output data from the United Nations Industrial Development Organization's (UNIDO) INDSTAT 4 database and combine them with export data from the UN Comtrade database to construct data for intra-national trade flows.

Data on RTA dummy are taken from Mario Larch's RTA database from Egger and Larch (2008).[4] Data on LCs in RTAs are taken from the Content of Deep Trade Agreements database provided at the World Bank's website.[5] This dataset was originally constructed by Horn et al. (2010) and substantially extended by Hofmann et al. (2018).

Moreover, the information on each country's OECD membership is taken from the web page of the OECD. Finally, GDP deflators are taken from the World Bank's World Development Indicators.

4 Empirical Framework

To investigate how LCs affect the trade creation effect of RTAs, based on the structural gravity equation (1), we express our estimation equation as follows:

$$X_{ijt} = \exp\Big(\beta_0 + \beta_1 RTA_{ij,t-1} + \beta_2 LC_{ij,t-1} + \psi_{ij} + \mu_{it} + \nu_{jt} + \epsilon_{ijt}\Big), \tag{2}$$

where X_{ijt} is the real export of manufacturing goods from country i to country j at year t. Following Baier and Bergstrand (2007), the nominal export values are deflated by using exporter GDP deflators. Moreover, we follow the discussion in the recent gravity literature and include *intra*-national trade in X_{ijt} (i.e., X_{ijt} with $i = j$). In the gravity literature, it is well known that the impact of RTAs is

[4] https://www.ewf.uni-bayreuth.de/en/research/RTA-data/index.html

[5] https://datacatalog.worldbank.org/dataset/content-deep-trade-agreements

underestimated if intra-national trade is not included (Bergstrand et al., 2015; Dai et al., 2014; Yotov, 2012).[6]

On the right-hand side of Eq. (2), the explanatory variables with our primary interest are $RTA_{ij,t-1}$ and $LC_{ij,t-1}$. $RTA_{ij,t-1}$ is a dummy variable that takes the value one if countries i and j both belong to a common RTA at t and zero otherwise. $LC_{ij,t-1}$ is either the LCE dummy or LCN dummy. The LCE dummy is a dummy variable to capture the legally enforceable LCs in RTAs. It takes the value one if the RTA includes legally enforceable LCs, while it takes zero if either the RTA has no LCs or LCs in the RTA are not legally enforceable. On the other hand, the LCN dummy is a dummy variable to capture the LCs in RTAs that are not legally enforceable. It takes the value one if LCs are mentioned in the RTA but not legally enforceable and zero otherwise.[7] We use one-year-lagged variables for the RTA dummy and the LC dummies to cope with the possible gap between the timing of RTAs' entry into force and the emergence of the impact on trade.

Moreover, a constant term (i.e., β_0) and various fixed effects represented by ψ_{ij}, μ_{it}, and ν_{jt} are also included when we estimate Eq. (2). Finally, ϵ_{ijt} is an error term.

In order to capture the possible heterogeneous impacts of LCs on trade by the type of country pairs, we construct the NS, SN, and SS dummies. The NS dummy takes the value one if country i is an OECD member and country j is a non-OECD member. We consider OECD members as Northern countries and non-OECD members as Southern countries. Similarly, the SN dummy takes the value one if country i is a non-OECD member and country j is an OECD member and the SS dummy takes the value one if countries i and j are both non-OECD members. We include the interaction terms between the RTA dummy and NS, SN, and SS dummies and between the LC dummies and NS, SN, and SS dummies.[8]

We first estimate Eq. (2) by the OLS. In the OLS estimations, we take the logarithm on both sides of Eq. (2). We include the time-varying exporter's and importer's fixed effects and exporter-importer fixed effects to control for multilateral resistance terms and any unobserved variables that will affect the incentives to form an RTA or to include LCs in RTAs.

Since the OLS estimates of the log-linearized model may be biased and inefficient due to the omis-

[6]Recall that in principle the trade creation effect of an RTA arises partly from replacing intra-national trade by imports from a (more efficient) member country of the RTA.

[7]In the World Bank's database, there are two indexes to measure the degree of legal enforceability of each provision in RTAs. One index is the AC index, which takes the value one if a provision is mentioned and zero otherwise. The other index is the LE index, which evaluate the degree of legal enforceability of each provision by the scale of three from zero to two: 0 for not legally enforceable; 1 for legally enforceable but explicitly excluded by dispute settlement provision; and 2 for legally enforceable. Our LC dummies are constructed in the following manner: The LCE dummy takes the value one if the AC index is one and the LE index is two for the category of "Labour Market Regulation" in Hofmann et al.'s (2018) original data, and takes the value zero otherwise. The LCN dummy takes one if the AC index is one and the LE index is either zero or one for that category in their original data, and takes zero otherwise.

[8]This way we regard the pairs of Northern countries (NN) as the benchmark group, represented by no dummies.

sion of zero-trade observations, we also estimate Eq. (2) by the Poisson pseudo-maximum likelihood (PPML) estimator, which is recommended by the literature (Anderson, 2011; Head and Mayer, 2014; Santos Silva and Tenreyro, 2006, 2011). As in the OLS, we include exporter-year, importer-year, and exporter-importer fixed effects in the PPML estimations. Based on the current discussion in the gravity literature (e.g., Head and Mayer, 2014), we think that the PPML estimation with exporter-year, importer-year, and exporter-importer fixed effects is our most preferred specification.

Descriptive statistics and correlations of the variables are provided in Tables 1 and 2, respectively.

(Insert Tables 1 and 2 around here.)

As we will discuss in Section 5.3, endogeneity is an important issue to be addressed. To deal with the endogeneity issue, we employ the instrumental variable approach with two-stage least squares (IV/2SLS) estimation. We will explain the details of our IV/2SLS estimation in Section 5.3.

5 Empirical Results

5.1 Baseline estimations

In this section, we report our estimation results. First, the baseline results from the OLS and PPML estimations are reported in Table 3. Columns (1) and (2) report the results from the OLS estimations and columns (3) and (4) indicate those from the PPML estimations.

As shown in the table, the estimated coefficient on the RTA dummy is positive and highly significant in all estimations.

The estimated coefficients on the LCE and LCN dummies are somewhat different between the estimation techniques. By the OLS, the estimated coefficient is negative but insignificant for the LCE dummy and is negative and highly significant for the LCN dummy. By the PPML, in contrast, the estimated coefficient on the LCE dummy is positive and highly significant, whereas that on the LCN dummy is still negative but statistically insignificant. Thus, for both the LCE and LCN dummies, the OLS estimation tends to yield *lower* effects of LCs on trade than the PPML estimation does. This result is quite intuitive because the OLS estimation omits observations with zero trade. Thus, the OLS estimation captures only the intensive margin of the effects of LCs on trade. On the other hand, the PPML estimation can capture both the intensive and extensive margins of the LCs' trade effects. Our estimation results imply LCs (both LCE and LCN) affect the extensive margin positively.

(Insert Table 3 around here.)

5.2 Heterogeneous impacts of labor clauses on trade by the type of country pairs

The effects of LCs on trade may be heterogeneous across the types of country pairs such as developed and developing countries, as the importance or implication of LCs in an RTA may be different between developed and developing countries. To investigate this issue, we categorize countries of the OECD members as the "North" and countries/regions of the OECD non-members as the "South."[9] Then, we estimate Eq. (2) by including the interaction terms between the RTA dummy and NS, SN, and SS dummies and between the LC dummies (i.e., the LCE and LCN dummies) and NS, SN, and SS dummies, having the NN group represented by the non-interacted terms.

The estimated results are reported in Table 4.

(Insert Table 4 around here.)

The estimated results are generally consistent between the OLS and PPML models. With regard to the RTA dummy, the estimated coefficient of the RTA dummy is positive and highly significant in all estimations. However, its interaction terms are negative and statistically significant in many cases. These results suggest that the RTA's trade creation effect exists with both statistically and economically significant for trade between the developed countries. However, the trade creation effect may be smaller or even insignificant for trade between other types of country pairs.

Regarding the impacts of LCs, the estimated coefficient of the LCE dummy is positive and statistically significant for trade between the developed countries (our benchmark) and exports from the developing to developed countries (as the coefficient of $(LCE \times SN)_{t-1}$ is insignificant). However, the positive effect of the LCE dummy becomes insignificant or even turns to be negatively significant for trade between developing countries, as the estimated coefficient of the $(LCE \times SS)_{t-1}$ term is significantly negative and the size of the estimate just offsets the effect of the baseline estimate in column (3) and more than offsets that in column (1). The estimated coefficient of the $(LCE \times NS)_{t-1}$ is significantly negative (and the size of large) in column (1) and insignificant in column (3), suggesting that the effect of LCE is significantly positive in the PPML but significantly negative in the OLS.

On the other hand, the estimated coefficient of the LCN dummy is negative and statistically significant for trade between the developed countries. Although this result holds for other types of country pairs in the OLS (as all interaction terms have insignificant coefficients), in the PPML the effects are quite different for other types of country pairs. In particular, the effect of LCN becomes insignificant for exports from the developing to developed countries (as the significantly positive coefficient just offsets the negative effect of the baseline estimate). The effect becomes significantly positive for exports from the developed to developing countries and trade between the developing

[9] We take into account the change in the OECD membership status over time during our sample period.

countries (as the significantly positive coefficient more than offsets the negative effect of the baseline estimate).

Therefore, the results in Table 4 suggest that LCs may enhance the trade creation effect of RTAs if they are legally enforceable but may reduce the trade creation effect of RTAs if they are not legally enforceable. However, those effects are heterogeneous, depending on the types of country pairs.

Comparing the results of the OLS with those of the PPML, LCE affects the extensive margin positively for trade other than exports from the South to the North. On the other hand, LCN tends to affect the extensive margin negatively for trade between developed countries, whereas the effect on the extensive margin is positive for trade of other types of country pairs.[10]

5.3 Endogeneity of labor clauses

Finally, the potential endogeneity of LCs may distort the estimates of the impact of the LC dummies, as a country's decision on whether or not it agrees to include LCs in an RTA might be affected by its past experience or history in trade relations or trade agreements. The inclusion of exporter-importer fixed effects can partially address the omitted variable bias. However, the endogeneity may still affect the estimates of the LC dummies. To deal with this issue, we employ the instrumental variable estimation with two-stage least squares (IV/2SLS).[11]

We use the following instrumental variables (IVs). We assume that the inclusion of LCs in RTAs is affected by the similarity or difference of the negotiating parties in their attitudes towards legally enforceable or unenforceable LCs. We can measure each country's attitude towards LCs by the number of existing RTAs with LCs of which the country is a member. Formally, let LC_{ikt}^{AC} be the point of the AC index (either zero or one) of labor provision in the RTA to which countries i and k belong to at t. Similarly, LC_{ikt}^{LE} be the point of the LE index (zero, one, or two) of labor provision in the RTA

[10] We check the robustness of the results in Sections 5.1 and 5.2 in two ways. First, we consider the possibility that the presence of outliers may distort the estimation results. We address this issue by re-estimating the model excluding observations in the top one percent of the distribution of the dependent variable (bilateral manufacturing exports) with a positive value. Second, we consider the possibility that the unbalanced panel structure of the data may distort the estimation results, as in our sample the number of observations is significantly small for some countries and regions (there are only less than 500 observations for each of those countries/regions whereas the dataset contains more than 2,000 observations per country/region for the great majority of our sample countries/regions.) To address this issue, we re-estimate the model excluding those countries/regions with limited observations. In both re-estimations, the results are virtually the same as those presented in Tables 3 and 4. We thus confirm that our findings in Sections 5.1 and 5.2 are generally robust.

[11] As a counterpart of the PPML model, the Stata's command `ivpoisson` enables us to implement the Poisson estimations with IVs. However, this estimation method is restricted in the sense that we cannot include fixed effects and that test statistics are not provided. Consequently, the results from the `ivpoisson` estimations cannot be compared with those from the PPML estimations presented in columns (3) and (4) of Table 3 and Table 4. For this reason, we focus on the estimations by the IV/2SLS.

to which countries i and k belong to at t. Then, we can measure country i's attitude towards legally enforceable LCs by calculating the total points of the AC and LE indexes in RTAs of which country i is a member: $\sum_{k\in\Omega_{it}}(LC^{AC}_{ikt}+LC^{LE}_{ikt})$, where Ω_{it} is the set of countries with which country i has a common RTA at t. Using this index, we can construct the following variable:

$$Abs\_Diff\_LC_{ijt}=\left|\sum_{k\in\Omega_{it}}(LC^{AC}_{ikt}+LC^{LE}_{ikt})-\sum_{l\in\Omega_{jt}}(LC^{AC}_{jlt}+LC^{LE}_{jlt})\right|,$$

where Ω_{jt} is the set of countries with which country j has a common RTA at t. Thus, $Abs\_Diff\_LC_{ijt}$ measure the difference between i and j in their attitudes towards legally enforceable LCs. Similarly, we can measure the difference between i and j in their attitudes towards LCs, regardless of whether they are legally enforceable or not, by the following index:

$$Abs\_Diff\_LC^{AC}_{ijt}=\left|\sum_{k\in\Omega_{it}}LC^{AC}_{ikt}-\sum_{l\in\Omega_{jt}}LC^{AC}_{jlt}\right|.$$

Then, we use $Abs\_Diff\_LC_{ijt}$ as an IV for LCE and $Abs\_Diff\_LC^{AC}_{ijt}$ for LCN. Our idea is that as $Abs\_Diff\_LC_{ijt}$ is larger, the less likely countries i and j sign an RTA with legally enforceable LC. The reason is that since country i and j differ in their attitudes towards legally enforceable LCs, either country is likely to reject the inclusion of legally enforceable LC in the negotiating RTA. Thus, $Abs\_Diff\_LC_{ijt}$ is negatively correlated with LCE.

In contrast, as $Abs\_Diff\_LC^{AC}_{ijt}$ is larger, only one of the negotiating parties (i and j) is eager to sign an RTA with LCs (regardless of whether legally enforceable or not). In such a case, a negotiation between i and j is likely to end up with including legally unenforceable LC in the RTA. Hence, we expect that $Abs\_Diff\_LC^{AC}_{ijt}$ is positively correlated with LCN.

To take into account the typical length of the period for negotiating RTAs, we use two-year-lagged $Abs\_Diff\_LC_{ijt}$ and $Abs\_Diff\_LC^{AC}_{ijt}$ as IVs.[12]

Importantly, neither $Abs\_Diff\_LC_{ij,t-3}$ nor $Abs\_Diff\_LC^{AC}_{ij,t-3}$ is conceptually correlated with trade between i and j at t, because how their attitudes towards LCs differ in their existing RTAs with other countries does not affect trade between i and j.

Moreover, to instrument for the interaction terms between LCE or LCN and the country-pair-type dummies (i.e., NS, SN, and SS dummies), we also create the interaction terms between $Abs\_Diff\_LC_{ijt}$ or $Abs\_Diff\_LC^{AC}_{ijt}$ and the country-pair-type dummies and use them as IVs in the model with interaction terms.

The estimated results are reported in Table 5.

(Insert Table 5 around here.)

[12]Since we use $LCE_{ij,t-1}$ and $LCN_{ij,t-1}$ as independent variables, we use $Abs\_Diff\_LC_{ij,t-3}$ and $Abs\_Diff\_LC^{AC}_{ij,t-3}$ as IVs in our estimations.

At the bottom of the table, we report various test statistics to evaluate the performance of our IV estimations. First, test statistics for the endogeneity test show that except for column (3), the null hypothesis that the endogenous regressors are actually exogenous cannot be rejected. The under-identification test indicates that the model is identified and hence the excluded instruments are relevant in all cases. The weak identification test rejects the null hypothesis that instruments are weak in columns (1) and (2) (Stock-Yogo weak ID test critical values are not available for columns (3) and (4)). Finally, the weak-instrument-robust inference tests the null hypothesis that the coefficients of the endogenous regressors in the structural equation are jointly equal to zero and that the overidentifying restrictions are valid. Anderson-Rubin Wald test statistics indicate that the null hypothesis cannot be rejected in all cases, meaning that the orthogonality conditions and the overidentifying restrictions are valid.

Now, with regard to the results of the IV/2SLS estimations, as shown in the table, the estimated coefficients of both the LCE dummy and the LCN dummy become statistically insignificant.[13] Moreover, their interactions terms are also statistically insignificant. These results suggest that the significantly positive (negative) impacts of the LCE (LCN) dummy that we found in Tables 3 and 4 should be carefully interpreted. Once we address the potential endogeneity issue in LCs, the LCs' impacts on the RTA's trade creation effect become insignificant. Thus, it implies that countries might selectively decide whether they include LCs in the negotiated RTAs, depending on whether the inclusion of LCs positively or negatively affects the trade creation effect of RTAs.

6 Concluding Remarks

In this paper we have empirically investigated whether labor provisions included in a RTA have a positive or negative impact on the RTA's expected trade creation effect and resulted trade flows between the RTA partners. We have estimated a structural gravity model using aggregated data on

[13]The results of the first-stage estimations are as follows: As for the model for legally enforceable LCs (that corresponding to the second-stage result in column (1) of Table 5), the estimated coefficient on the instrument for the LCE dummy (Abs_Diff_LC) is negative and highly significant, as expected. As for the model for not legally enforceable LCs (that corresponding to the second-stage result in column (2)), the estimated coefficient on the instrument for the LCN dummy ($Abs\_Diff\_LC^{AC}$) is negative and statistically significant. This is not necessarily consistent with our expectation, though the estimated coefficient is quite small and close to zero. For the model with the LCE dummy and interaction terms with country pair type dummies (corresponding to column (3)), the estimated coefficients on the instrument Abs_Diff_LC and its interacted terms with country pair type dummies are all negative and significant for LCE for all the country pair types (NN, NS, SN, and SS), which agrees with our expectation. Finally, with regard to the model with the LCN dummy and interaction terms (corresponding to column (4)), the estimated coefficients on the instrument $Abs\_Diff\_LC^{AC}$ and its interacted terms with country pair type dummies are positive and highly significant for the LCN for all the pair types, consistently with our expectation, except for developing country pairs (SS).

trade and RTAs from various sources.

Our results from the PPML estimations suggest that labor provisions tend to increase the trade creation effect of RTAs on average when they are legally enforceable. We have also found that the trade enhancing effect of legally enforceable LCs is particularly significant for trade between developed countries whereas it is insignificant for trade between developing countries. In contrast, the estimation results suggest that LCs have a negative but insignificant average impact on the trade creation effect of RTAs when they are not legally enforceable. We have also found that legally unenforceable LCs should reduce the trade creation effect of RTAs between developed countries although they may rather enhance it when trade involves developing countries particularly as the importer. Furthermore, we have found that the endogeneity of LCs should be significant. Once we instrument for the LC variables, the estimated impacts of LCs become insignificant. This may imply that countries behave selectively in deciding whether they include labor provisions in the negotiated RTAs by assessing their potential impact on trade with the RTA partners.

References

Anderson, James E. 2011. "The gravity model." *Annual Review of Economics* 3(1): 133–160.

Anderson, James E. and Eric van Wincoop. 2003. "Gravity with gravitas: A solution to the border puzzle." *American Economic Review* 93: 170–192.

Baier, Scott L. and Jeffrey H. Bergstrand. 2007. "Do free trade agreements actually increase members' international trade?" *Journal of International Economics* 71: 72–95.

Bergstrand, Jeffrey H., Mario Larch, and Yoto V. Yotov. 2015. "Economic integration agreements, border effects, and distance elasticities in gravity equation." *European Economic Review* 78: 307–327.

Carrère, Céline, Marcelo Olarreaga, and Damian Raess. 2017. "Labor clauses in trade agreements: Worker protection or protectionism?" CEPR Discussion Papers No. 12251.

Cipollina, Maria and Luca Salvatici. 2010. "Reciprocal Trade Agreements in Gravity Models: A Meta-Analysis." *Review of International Economics* 18(1): 63–80.

Dai, Mian, Yoto V. Yotov, and Thomas Zylkin. 2014. "On the trade-diversion effects of free trade agreements." *Economic Letters* 122(2): 321–325.

Egger, Peter H. and Mario Larch. 2008. "Interdependent preferential trade agreement memberships: An empirical analysis." *Journal of International Economics* 76(2): 384–399.

Head, Keith and Thierry Mayer. 2014. "Gravity equations: Workhorse, toolkit, and cookbook." In G. Gopinath, E. Helpman, and K. Rogoff, eds. *Handbook of International Economics*, Vol. 4. Amsterdam: Elsevier, 131–195.

Hofmann, Claudia, Alberto Osnago, and Michele Ruta. 2018. "The content of preferential trade agreements." *World Trade Review*, FirstView.

Horn, Henrik, Petros C. Mavroidis, and André Sapir. 2010. "Beyond the WTO? An anatomy of EU and US preferential trade agreements." *The World Economy* 33: 1565–88.

ILO (2016), Assessment of Labour Provisions in Trade and Investment Arrangements, International Labour Organization, Geneve.

Kamata, Isao. 2014. "Regional Trade Agreements with Labor Clauses: Effects on Labor Standards and Trade." RIETI Discussion Paper Series 14-E-012, Research Institute of Economy, Trade and Industry.

Kamata, Isao. 2016. "Labor Clauses in Regional Trade Agreements and Effects on Labor Conditions: An Empirical Analysis." IDE Discussion Paper No. 609, Institute of Developing Economies (IDE-JETRO).

Kamata, Isao. 2018. "Can RTA labor provisions prevent the deterioration of domestic labor standards? : the cases of statutory minimum wages and employment protection regulations." IDE Discussion Paper No. 716, Institute of Developing Economies (IDE-JETRO).

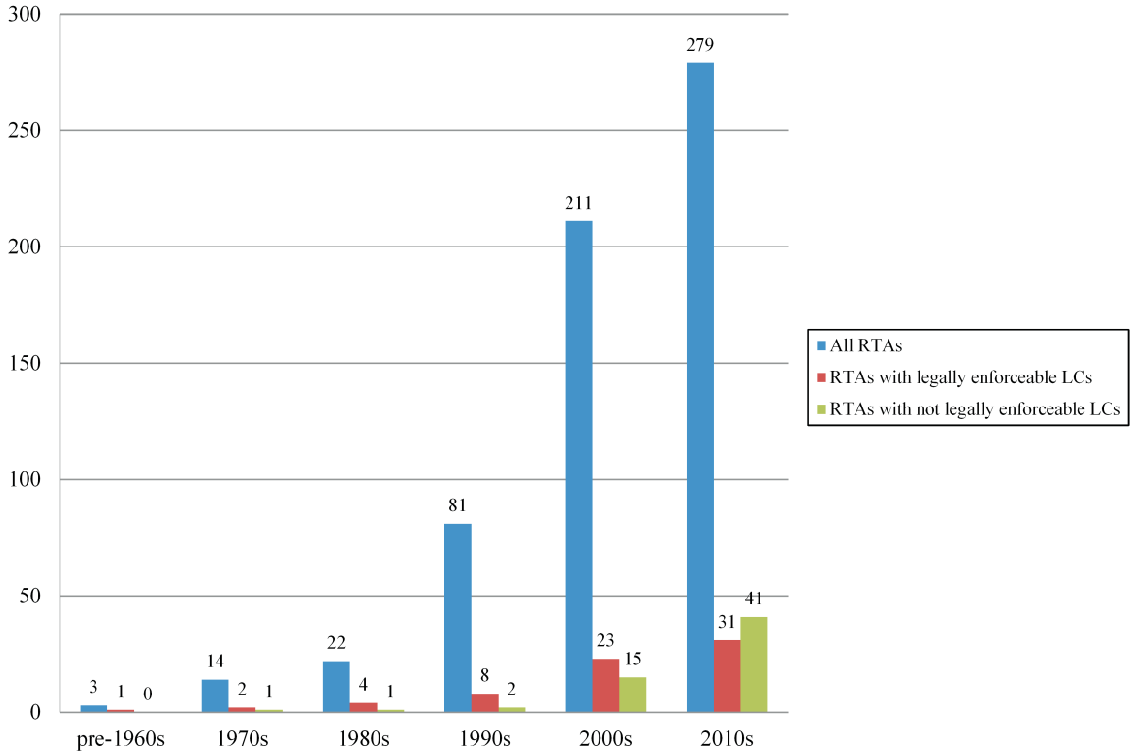
Limão, Nuno. 2005. "Trade Policy, Cross-border Externalities and Lobbies: Do Linked Agreements Enforce More Cooperative Outcomes?" *Journal of International Economics* 67(1): 175–199.

Raess, Damian and Dora Sari. 2018. "Labor provisions in trade agreements (LABPTA): Introducing a new dataset." *Global Policy* 9(4): 451–466.

Santos Silva, J.M.C. and Silvana Tenreyro. 2006. "The log of gravity." *Review of Economics and Statistics* 88: 641–658.

Santos Silva, J.M.C. and Silvana Tenreyro. 2011. "Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator." *Economics Letters* 112: 220–222.

Yotov, Yoto V. 2012. "A simple solution to the distance puzzle in international trade." *Economics Letters* 117(3): 794–798.



Note: The cumulative numbers of RTAs in each category that have been signed as of the indicated periods. The definitions of "legally enforceable LCs" and "not legally enforceable LCs" are as described in Section 4 of the text.
Source: The authors' creation using data from the World Bank's Content of Deep Trade Agreements database (Hofmann et al., 2018)

Figure 1: Cumulative Numbers of RTAs with Labor Clauses (LCs) in the World

Table 1: Descriptive Statistics

Variable	No. of Obs	Mean	Std. Dev.	Min	Max
X	390,695	9.11e+07	4.44e+10	0.000	2.77e+13
$\ln(X)$	371,292	8.272	3.924	−9.103	30.951
RTA_{t-1}	390,695	0.207	0.405	0	1
LCE_{t-1}	390,695	0.035	0.185	0	1
LCN_{t-1}	390,695	0.011	0.102	0	1
$Abs\_Diff\_LC_{ij,t-3}$	390,695	24.202	34.779	0	125
$Abs\_Diff\_LC^{AC}_{ij,t-3}$	390,695	8.874	11.607	0	42

Notes: The definition and explanation of each variable are provided in Sections 4 and 5.3 of the text.

Table 2: Correlations of the Variables

	X	$\ln(X)$	RTA_{t-1}	LCE_{t-1}	LCN_{t-1}	$Abs\_Diff\_LC_{ij,t-3}$	$Abs\_Diff\_LC^{AC}_{ij,t-3}$
X	1.0000						
$\ln(X)$	0.0115	1.0000					
RTA_{t-1}	−0.0009	0.2130	1.0000				
LCE_{t-1}	−0.0004	0.2090	0.3738	1.0000			
LCN_{t-1}	−0.0002	−0.0207	0.1887	−0.0198	1.0000		
$Abs\_Diff\_LC_{ij,t-3}$	−0.0013	0.0670	0.0240	−0.0445	−0.0241	1.0000	
$Abs\_Diff\_LC^{AC}_{ij,t-3}$	−0.0015	0.0206	0.0123	−0.0576	−0.0206	0.9460	1.0000

Notes: The definition and explanation of each variable are provided in Sections 4 and 5.3 of the text.

Table 3: Baseline Estimations: The Impacts of LC on International Bilateral Trade

	(1)	(2)	(3)	(4)
	OLS	OLS	PPML	PPML
RTA_{t-1}	0.149***	0.162***	0.127***	0.193***
	(0.023)	(0.024)	(0.038)	(0.051)
LCE_{t-1}	−0.003		0.341***	
	(0.031)		(0.048)	
LCN_{t-1}		−0.167***		−0.134
		(0.063)		(0.108)
Exporter-Importer FE	Yes	Yes	Yes	Yes
Exporter-year FE	Yes	Yes	Yes	Yes
Importer-year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.886	0.886		
Log. likelihood			-1.42E+10	-1.44E+10
No. of obs.	368607	368607	388055	388055

Notes: (a) The dependent variable is $\ln(X_{ijt})$ in (1) and (2) and X_{ijt} in (3) and (4). (b) Estimations are implemented using the Stata command `ppml_panel_sg` for (3) and (4). (c) ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. (d) Standard errors clustered by country-pair are in parentheses. (e) The regressions include the constant term.

Table 4: Heterogeneous Impacts of LC on Trade: Country Groups by North and South

	(1) OLS	(2) OLS	(3) PPML	(4) PPML
RTA_{t-1}	0.309***	0.369***	0.255***	0.514***
	(0.048)	(0.051)	(0.059)	(0.076)
$(RTA \times NS)_{t-1}$	−0.187***	−0.269***	−0.173**	−0.422***
	(0.051)	(0.053)	(0.086)	(0.089)
$(RTA \times SN)_{t-1}$	−0.107**	−0.149***	0.023	−0.190*
	(0.050)	(0.052)	(0.101)	(0.110)
$(RTA \times SS)_{t-1}$	−0.125**	−0.205***	−0.262***	−0.521***
	(0.059)	(0.062)	(0.070)	(0.085)
LCE_{t-1}	0.172***		0.340***	
	(0.042)		(0.037)	
$(LCE \times NS)_{t-1}$	−0.292***		−0.159	
	(0.062)		(0.112)	
$(LCE \times SN)_{t-1}$	0.026		−0.057	
	(0.068)		(0.277)	
$(LCE \times SS)_{t-1}$	−0.508***		−0.300*	
	(0.085)		(0.165)	
LCN_{t-1}		−0.252**		−0.607***
		(0.116)		(0.099)
$(LCN \times NS)_{t-1}$		0.090		0.856**
		(0.140)		(0.335)
$(LCN \times SN)_{t-1}$		0.148		0.547***
		(0.151)		(0.192)
$(LCN \times SS)_{t-1}$		0.040		0.770***
		(0.155)		(0.142)
Exporter-Importer FE	Yes	Yes	Yes	Yes
Exporter-year FE	Yes	Yes	Yes	Yes
Importer-year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.886	0.886		
Log. likelihood			-1.41E+10	-1.42E+10
No. of obs.	368607	368607	388055	388055

Notes: (a) The dependent variable is $\ln(X_{ijt})$ for (1) & (2) and X_{ijt} for (3) & (4). (b) ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. (c) Standard errors clustered by country-pair are in parentheses. (d) The regressions include the constant term.

Table 5: Endogeneity of LC: IV/2SLS Estimations

	(1) IV/2SLS	(2) IV/2SLS	(3) IV/2SLS	(4) IV/2SLS
RTA_{t-1}	0.146***	0.147	0.169***	0.357***
	(0.024)	(0.178)	(0.029)	(0.136)
LCE_{t-1}	0.031		−0.298	
	(0.056)		(0.641)	
$(LCE \times NS)_{t-1}$			0.861	
			(1.354)	
$(LCE \times SN)_{t-1}$			1.071	
			(1.911)	
$(LCE \times SS)_{t-1}$			−1.834	
			(1.917)	
LCN_{t-1}		0.026		−2.312
		(2.195)		(2.351)
$(LCN \times NS)_{t-1}$				−2.593
				(6.578)
$(LCN \times SN)_{t-1}$				−0.822
				(4.445)
$(LCN \times SS)_{t-1}$				1.046
				(2.606)
Exporter-Importer FE	Yes	Yes	Yes	Yes
Exporter-year FE	Yes	Yes	Yes	Yes
Importer-year FE	Yes	Yes	Yes	Yes
Endogeneity Test				
Chi-sq [p-value]	0.88[0.35]	0.009[0.93]	14.95[0.005]	3.34[0.50]
Underidentification test				
Kleibergen-Paap rk LM stat [p-value]	1865.56[0.00]	43.77[0.00]	36.46[0.00]	13.34[0.00]
Weak identification test				
Kleibergen-Paap rk Wald F stat	11542.93	39.12	7.92	3.11
Weak-instrument-robust inference				
Anderson-Rubin Wald test				
F stat [p-value]	0.32[0.57]	0.00[0.99]	1.83[0.12]	0.93[0.44]
No. of obs.	369064	369064	369064	369064

Notes: (a) The dependent variable is $\ln(X_{ijt})$. (b) Estimations are implemented using the Stata command `ivreghdfe`. (c) IVs are $Abs\_Diff\_LC_{ij,t-3}$ in (1), $Abs\_Diff\_LC^{AC}_{ij,t-3}$ in (2), and $Abs\_Diff\_LC_{ij,t-3}$ and its interactions with NS, SN, and SS dummies in (3), and $Abs\_Diff\_LC^{AC}_{ij,t-3}$ and its interactions with NS, SN, and SS dummies in (4). (d) ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. (e) Standard errors clustered by country-pair are in parentheses. (e) The regressions include the constant term.