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Pacts and parity: impact of trade agreements on gender equality through textual references

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Abstract

Purpose – This paper aims to examine the impact of anti-discrimination references in trade agreements on gender equality measures in developing countries and provides estimates mostly covering the years 1991–2017.

Design/methodology/approach – This study gathers data from trade agreements, together with their related documents, to examine how the location and language of these references affect their enforceability and impact. Two types of references that aim to support gender equality are analyzed. They differ in their location within the documents and the language used.

Findings – The results indicate that such references are more likely to improve gender-related labor conditions when they appear in legally binding sections and are associated with hard modal verbs like "shall" or "should," in contrast to those that appear in aspirational sections and are associated with softer modal verbs like "may" or "might". Furthermore, the results highlight a significant effect of these references in the agriculture sector, which hosts most of the female labor force in developing countries.

Originality/value – This study contributes to the existing literature by investigating the impact of references to gender equality in trade agreements and connected documents on the share of female temporary employees, the share of female vulnerable employees, as well as the disparity between the share of female and the share of male salaried workers in developing countries. This research also fills a gap in the literature by providing empirical evidence on the impact of these references on the share of female employment in services, agriculture and industry sectors. It also extends the current understanding of the importance of the used language for these references and the location of the references (as a sign of legal bindingness) by studying two sets of gender-related references (references that bind and references that influence).

Keywords Trade agreements, Gender equality, Developing countries, Labor provisions, Discrimination in employment

Paper type Research paper

1. Introduction

Trade agreements play a crucial role in stimulating trade, which leads to economic growth for developing countries [1]. Regional trade agreements (RTAs) increasingly incorporate gender

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provisions (related to gender equality and women's economic empowerment), indicating that trade agreements are not neutral concerning gender inequality (Korinek *et al.*, 2021). Despite this development, women are still primarily portrayed as mothers (based on the The Australia-New Zealand closer economic relations trade agreement (ANZCERTA), Peru–Republic of Korea, Republic of Korea–Central America agreements), as employees (The European Union (EU) trade agreements with Republic of Korea, Ukraine and Vietnam, Canada–Jordan) or their role in growth and development (based on the The Common Market for Eastern and Southern Africa (COMESA), Chile–Uruguay), rather than being entrepreneurs or decision-makers (based on the COMESA, The East African Community (EAC) Treaty) in trade agreements (Kuhlmann and Bahri, 2023). Although wage inequality is not addressed at the multilateral level in the World Trade Organization (WTO), bilateral agreements often include labor provisions that promote worker rights and gender equality (UNCTAD, 2019).

The work by Raess and Sari (2020) demonstrates that labor provisions in trade agreements have broadened their extent as well as involvement and have undergone substantial intensification over time. The EU [2] and the USA have been promoting fair labor practices and preventing countries that do not respect labor rights from engaging in unfair competition. Despite this, few disputes have been initiated in the EU and the USA (by 2019, only one dispute was instituted in the EU), and there has never been any case of enforcement by imposing fines or, ultimately, trade sanctions (Myant, 2022) [3].

While the extent of legal enforceability of the labor provisions is questionable given the low amount of disputes, there is some empirical literature on the impact of labor provisions in trade agreements (Kamata, 2016; Dewan and Ronconi, 2018; Williams and Lilly, 2021). In addition, a few empirical studies exist on the impact of labor provisions on gender equality issues (e.g. Bastiaens *et al.*, 2023; López Mourelo and Samaan, 2018). Bastiaens *et al.* (2023) study if preferential trade agreements (PTAs) with labor standards are associated with higher economic, civil and political freedom, while López Mourelo and Samaan (2018) study the impact of a particular trade agreement on the gender wage gap (GWG) and discrimination. However, these articles do not address the issue of the enforceability of gender-related references in trade agreements and their impact on developing countries. The location and language used to highlight gender-related references in the text of trade agreements can impact their enforceability, which is highly important for policymakers.

This paper addresses the issue of how to incorporate gender-related provisions in trade agreements and related documents. While there has been an increase in such provisions over time, the focus is not on whether they should be included, but rather on the best way to include them. The level of enforceability of labor provision varies by (i) language (i.e. how these obligations are referenced) and (ii) location (i.e. where these references appear). Developed countries (mostly the USA and the EU) introduce these references to promote gender equality in developing nations. This is particularly important because women in developing countries often have lower work participation rates than men, experience wage discrimination when employed, and spend long hours on unpaid household labor (Mitra, 2013). Santos Silva and Klasen (2021) also note that gender inequality can hinder long-term development, further highlighting the potential importance of trade agreements in narrowing the equality gap in developing countries [4]. Furthermore, the impact of the gender-related provisions on women in different sectors should be taken into account, as the distributional effects can vary, given that women tend to work more in agriculture and service sectors than in the industry sector of developing countries [5].

This study contributes to the existing literature by investigating the impact of references to gender equality in trade agreements and connected documents on the share of female temporary employees, the share of female vulnerable employees, as well as the disparity between the share

of female and the share of male salaried workers in developing countries. This research also fills a gap in the literature by providing empirical evidence on the impact of these references on the share of female employment in services, agriculture and industry sectors. It also extends the current understanding of the importance of the used language for these references and the location of the references (as a sign of legal bindingness) by studying two sets of gender-related references (references that bind and references that influence). The findings suggest that references that appear in legally binding sections and are associated with hard modal verbs like "shall" or "should" have a greater effect on gender inequality than those that can also be associated with softer modal verbs like "may" or "might" and appear in aspirational sections like preambles or parallel agreements, which may not be binding on their own.

The rest of the study is organized as follows. Section 2 provides a short literature review. Section 3 explains the data, discusses how key variables are generated and introduces the chosen method. Section 4 presents and discusses the results in detail. Finally, Section 5 concludes and provides policy implications.

2. Related literature

This study connects to two streams of literature; first, it relates to the studies that examine the impact of textual references on labor issues. Second, it links to the literature on the impact of trade and global value chain (GVC) integration on the GWG.

2.1 Trade agreements and labor rights

Numerous studies (Kamata, 2016; Williams and Lilly, 2021; Giumelli and van Roozendaal, 2017; Horn *et al.*, 2010; López Mourelo and Samaan, 2018; Robertson *et al.*, 2020; Dewan and Ronconi, 2018) have evaluated the impact of labor-related references in trade agreements. Some studies find no evidence between these references and improving labor conditions, while others conclude the opposite.

The study by Kamata (2016) analyzed 220 RTAs across 136 countries from 1995 to 2011 and found no evidence to suggest that RTA labor clauses positively impacted labor conditions. Williams and Lilly (2021) examined 25 years of labor clauses in Canadian trade agreements and found that while Canada encourages partners with weak labor regimes to improve their labor systems through these agreements, the clauses have not effectively spurred either party to enhance their own domestic labor systems. According to a study by Giumelli and van Roozendaal (2017), on free trade agreements (FTA) between the USA and 19 countries, labor clauses included in such agreements do not seem to have any impact on improving labor conditions in the countries that have signed them. This holds true irrespective of the specific content of the clause or any external pressures. These studies clearly demonstrate the ineffectiveness of labor clauses in improving labor conditions, highlighting the need for alternative approaches to address these issues. This ineffectiveness could be due to PTAs containing clauses specifying obligations in areas not covered by the WTO, such as labor standards (Horn *et al.*, 2010). The study by Horn *et al.* (2010) revealed that European Community (EC) agreements contain almost four times as many issues outside the WTO's mandates, but many of these obligations are not legally enforceable.

The studies by López Mourelo and Samaan (2018) and Robertson *et al.* (2020) have contributed to understanding the impact of labor provisions in trade agreements. The former study focused on the Bilateral Textile Agreement between Cambodia and the USA and found that requiring textile manufacturers to follow international core labor standards significantly reduced the GWG in the textile sector. On the other hand, the latter study analyzed the GWG during the Multi-Fiber Arrangement (MFA) period in Cambodia and Sri Lanka and revealed positive wage premiums and a decrease in the gap between male and female wages.

However, the premiums decreased and the wage gap widened after the MFA's conclusion. This highlights the potential positive impact of labor provisions in trade agreements on promoting gender equality, as well as the susceptibility of women to fluctuations in global apparel prices.

Moreover, Dewan and Ronconi (2018) used the difference in difference methodology and found that the level of strictness in the FTAs signed between the USA and Latin American countries, as well as the investment made by the US Government to enhance enforcement, played a significant role in improving the implementation of labor regulations. The signing of FTAs led to an increase in the number of labor inspectors and inspections. However, the North American Free Trade Agreement (NAFTA) failed to produce the same beneficial outcomes for labor conditions in Mexico. Overall, understanding the impact of trade on the GWG is essential in promoting fair labor conditions and gender equality.

2.2 Trade and gender wage gap

There are many mechanisms for how trade impacts the GWG. Oostendorp (2009) found that gender wage discrimination decreases with trade and higher economic development. Domestic export-oriented industries are generally more competitive, as they compete internationally with other export-oriented industries. Higher competitiveness results in higher cost of discrimination against women (World Bank and World Trade Organization, 2020). Women's participation and reduction in wage inequality are more likely when the industries are integrated globally via GVCs, as this further increases competition. According to a concept introduced by Reder (1958), in a pure competition framework with two groups, the impact of discrimination on one group reduces per capita real income for both groups.

Trade openness of countries with high gender wage discrimination provides a tool for countries that promote gender equality to put pressure on them via unilateral policies (Wang, 2018). Some countries award contracts for services only to those guaranteeing equal pay without gender discrimination (World Bank and World Trade Organization, 2020). Urata and Narjoko (2017) surveyed empirical findings and indicate that increased trade openness by developing countries seems to have helped reduce the development gap with developed countries. However, its impact on the income disparity within developing countries remains uncertain. Trade openness is linked to a higher accumulation of education and skills. It also improves women's rights, and hence, increases gender equality (World Bank and World Trade Organization, 2020; Schultz, 2014). These effects are much stronger in GVCs. Furthermore, integration into GVCs also has been associated with higher incomes and more knowledge and technology transfers.

The study by Ben Yahmed and Bombarda (2020) shows the importance of trade liberalization for workers to hold a formal job. The study finds that regional exposure to trade liberalization increases the chances of workers for getting a formal job. Female labor participation in GVCs has been associated with a ten percentage point higher probability that they hold a formal job compared to those who are not involved in GVCs (World Bank and World Trade Organization, 2020). Based on World Bank and World Trade Organization (2020), the probability of holding an informal job (being unpaid or working without contract) reduces by 7% in sectors that are integrated into GVCs or have a high level of exports. Moreover, workers who hold formal jobs can be heard and protected by trade unions, further increasing the chances of reducing gender wage discrimination. Therefore, higher GVC participation could reduce the wage gap between women and men.

Some of the literature, however, does not find that international trade reduces wage discrimination. According to Berik *et al.* (2004), in concentrated sectors, employers may cover the cost of discrimination that exists in the competition via excess profit; hence, an increase in

international trade may reduce women's bargaining power. Berik *et al.* (2004) find that in Taiwan and Korea, competition from foreign trade in concentrated industries results in more wage-gender discrimination. Moreover, Bøler *et al.* (2018) argue that exporting firms require higher commitment and disproportionately reward employee flexibility. If females are perceived to be less flexible, exporting firms will have a higher GWG. The results of this study also show a higher GWG for exporting firms than for nonexporters. The study by Nikulin and Wolszczak-Derlacz (2022) shows GWG is increased in sectors that are more involved in GVCs.

3. Empirical strategy and data

The primary objective of this research is to investigate the impact of references related (directly or indirectly) to gender equality on various gender equality measures in developing countries. To highlight the importance of the location and language of references to gender equality measures in trade agreements, this paper studies the relationship between two sets of references: References that Influence (RtIs) and References that Bind (RtBs). This is possible because language and location are the two fundamental differences between RtBs and RtIs.

In terms of language, RtIs only include references to the thematic area of gender equality. Thus, labor-related references that concern the elimination of work and occupational discrimination without mentioning gender equality directly in the text of trade agreements are not accounted for. On the other hand, RtBs include substance-related references [6] to abolishing discrimination, whether there is a direct mention of gender equality (i.e. equal remuneration/pay for men and women for work of equal value) or those that do not directly refer to the gender issue in the text of the trade agreement but account gender equality indirectly [i.e. (i) International Labor Organization (ILO) Convention No. 100 (Equal Remuneration Convention); (ii) elimination of discrimination of any form in respect of employment and occupation/work; (iii) ILO Convention No. 111 "Discrimination (Employment and Occupation) Convention"; and (iv) ILO fundamental labor/worker's rights/conventions]. Moreover, only those references that use modal words are selected, as they are more enforceable and can be used against a party or to provide remedial measures in the case of noncompliance to the agreed obligations. RtBs are related to "hard" modal words, while RtIs do not distinguish between "soft" and "hard" ones. RtBs identify legally binding commitments by the use of terms such as "shall," "will," "agree," "undertake," "ensure" and "realize," while RtIs also consider softer obligations with the use of terms such as "may" (Raess and Sari, 2020; Corley-Coulibaly *et al.*, 2022).

RtBs also differ from RtIs in terms of the location of the text. RtBs are substance-related labor provisions and are found in the core text of the trade agreements. References that are in the side agreements and memoranda of understanding (MoUs) are only accounted for if there is a direct reference to the core text (Raess and Sari, 2020). As such, RtBs do not include aspirational references, which appear in the preamble and objective part of the trade agreements or cooperative agreements. On the other hand, RtIs include both substance-related obligations and procedural commitments [7] that appear in preamble or parallel agreements, such as MoUs and agreements on labor cooperation. Although parallel or side agreements may be related to binding trade agreements, on their own, these documents may be non-binding [8]. Although mostly aspirational statements, references that appear in the preamble can be influential and categorized as RtIs. They may help to define the goals and entirety of a trade agreement [9] (Corley-Coulibaly *et al.*, 2022).

In essence, the main difference between RtBs and RtIs is that while RtBs mainly include content deemed important for their enforceability, RtIs cover both soft and hard obligations related to cooperation and dialogue-based activities, as well as the procedural aspect of dispute settlement activities (Corley-Coulibaly *et al.*, 2022). For example, the EU–Republic

of Korea trade agreement can be mentioned (see Example 1 in Appendix 4). This trade agreement includes RtBs, as it contains ILO fundamental labor rights, and RtIs, as it references cooperation on gender equality issues. Similarly, the trade agreement between the Republic of Korea and Türkiye is another example (see Example 2 in Appendix 4) with both RtBs and RtIs for the same reasons. Even though these references are within the framework agreement (parallel agreement), the parallel agreement is a legally binding document. As an example of trade documents that contain RtIs but not RtBs, the NAFTA trade agreement can be brought up (Example 5 in Appendix 4), where gender equality issues are discussed in the parallel agreement to the core text (article 11: cooperative activities). The agreement does not contain RtBs because it is part of cooperation activities rather than substantive obligations [similarly, the EU–Chile (see Example 6 in Appendix 4) agreement can be mentioned]. Finally, New Zealand–Chinese Taipei (see Example 4 in Appendix 4) and Colombia–Chile (see Example 3 in Appendix 4) trade agreements are examples that contain RtBs but not RtIs. They include declarations on fundamental principles and rights at work and its follow-up by ILO, which includes "the elimination of discrimination in respect of employment and occupation" without any direct mention of gender.

Given these characteristics of RtIs and RtBs, this paper hypothesizes that including RtIs in trade agreements may not have a statistically significant correlation with gender equality measures in developing countries, as such references may appear in locations that are not legally binding. However, the hypothesis put forward in this paper proposes that RtBs can positively impact gender equality in developing nations, even though in most cases, these references may be linked to gender equality indirectly, i.e. references such as "Equal Remuneration Convention" and "elimination of discrimination of any form in respect of employment and occupation/work", etc. without any mention of the words "gender," "women," etc.

3.1 Data

The data in this study is collected from various sources. They are selected to represent the gender equality measures from the developing countries whose trade agreements are being analyzed. The central database is collected under the aegis of the World Bank and based on the work of Hofmann *et al.* (2017) and Raess and Sari (2018), providing a detailed assessment of the content trade agreements. The data provides information on the labor provisions related to eliminating discrimination concerning employment and occupation. Based on the work of Raess and Sari (2018), the labor provisions (LPs) in this data are defined as rules and guidelines meant to protect and improve employees' rights and working conditions. However, they do not cover social protection issues such as education, health, old age or unemployment. These provisions do not include employment and labor market policies, such as training and measures to match labor supply and demand. They also do not address the treatment of migrant workers or the free movement of workers. LPs are recognized in treaty texts, side agreements and MoUs. However, side agreements and MoUs must be directly related to the main treaty text and referenced specifically to be considered valid. Gender-related references are categorized into binding or non-binding. RtBs are those in the LPs of any binding commitments that may or may not have a dispute settlement (DS) mechanism covering labor-related commitments. Non-binding and best endeavor commitments are identified using terms such as "shall strive," "shall endeavor" and "should". Binding commitments are identified with the use of verbs such as "shall," "will" and "agree". Moreover, the LP Hub database from the International Labour Organization (2022) is used, containing 100 trade agreements. Based on Corley-Coulibaly *et al.* (2022), the database provides the means to determine whether gender references are considered RtIs.

RtIs and RtBs broadly cover the importance of eliminating discrimination in work and employment. Therefore, several gender-related variables are used to measure their broad impact in developing countries. To determine the impact of these references, this paper uses female salaried workers as a percentage of female employment and male salaried workers as a percentage of male employment denoted as *FL* and *ML*, respectively. The data was gained from International Labour Organization (2021). The variable *Salaried Gap* is calculated based on the equation below:

$$Salaried\ Gap_t = ML_{ct} - FL_{ct}, \tag{1}$$

where *t* denotes the year. The variable *Salaried Gap* highlights the gap between the number of men and women in paid employment. Thus, self-employed workers are not included in the observation. Self-employment includes (i) self-employed workers with employees (employers), (ii) self-employed workers without employees (own-account workers) and (iii) unpaid family workers (contributing family workers). Own-account workers and contributing family workers are least likely to have social protections. They usually cannot generate sufficient savings to provide safety nets and offset economic shocks (The World Bank, 2023a).

Furthermore, these references capture discrimination related to employment, and those who are not considered paid employees may not benefit from these references. As the cost of employment increases with less discrimination, employers may lay off some of the female employees, and hence, it is expected that the sum number of female contributing family workers and own-account workers as a percentage of total employment (defined as female vulnerable employment and denoted as *Vulnerable Females*) will increase in developing countries [10]. Furthermore, this paper anticipates a heterogeneous response in female employment to RtBs, and therefore, the methodology uses variables denoted as *Agriculture*, *Industry* and *Services* to capture female employment in agriculture, industry and services as a percentage of female employment, respectively. Although the service sector contributes indirectly to trade by creating value-added products, it does not directly engage in trade with other countries and, hence, is not covered by labor provisions in trade agreements. As a result, it is anticipated that RtBs will result in the proportion of women employed in the service sector shifting toward the agriculture and industry sectors for more equality, and hence, this paper expects a negative coefficient related to RtBs for the service sector. Moreover, based on the descriptive statistics presented in Appendix 3, it can be seen that the average percentage of women employed in the agriculture is higher than industry in developing countries. This suggests that the impact of RtBs is more likely to be more positive and of higher magnitude in the agriculture sector than in the industry sector.

Employment can be permanent or temporary. Temporary employment includes seasonal work, casual work (such as day labor), fixed-term contracts for a specific period and project-based or task-based contracts. Temporary employment is less costly for the employer yet is considered a form of employment. The RtBs are expected to increase the share of female temporary employees as a percentage of total employees, a metric sourced from International Labour Organization (2023), which, in this study, is denoted as *Temporary*. The analysis for dependent variable *Temporary*, reported in Table 3, is based on data beginning in 1990 and extending through 2017. The analysis for dependent variables *Salaried Gap*, *Vulnerable Females*, *Agriculture*, *Industry* and *Services*, reported in Tables 1–3, uses data from 1991 to 2017, reflecting the availability of data for all relevant variables during this time frame.

The study uses three control variables. The first variable is the natural logarithm of gross domestic product (GDP) per capita, which is converted to US dollars using Purchasing Power Parity factors and multiplied by 100 for easier interpretation of the coefficient. This

Table 1. Estimation results for salaried gap and vulnerable females

Dependent variable	Salaried gap (1)	(2)	Vulnerable females (3)	(4)
LnGDP	0.0182** (0.00870)	0.0170* (0.00866)	−0.0189 (0.0124)	−0.0186 (0.0127)
Labor	0.176* (0.106)	0.173 (0.105)	0.325** (0.140)	0.297** (0.145)
RtIs	−1.081** (0.543)		−0.760 (1.164)	
$RtIs_{t-1}$	−0.0664 (0.145)		0.0847 (0.198)	
$RtIs_{t-2}$	0.226 (0.245)		0.0458 (0.217)	
$RtIs_{t-3}$	1.548*** (0.516)		0.985 (0.681)	
LnExport	0.00156 (0.00191)	0.00233 (0.00196)	0.00324 (0.00239)	0.00343 (0.00231)
RtBs		−1.505 (1.030)		1.051 (0.658)
$RtBs_{t-1}$		−1.200** (0.502)		0.122 (0.527)
$RtBs_{t-2}$		0.432 (0.497)		0.650** (0.309)
$RtBs_{t-3}$		0.487 (0.588)		0.558 (0.797)
Constant	−21.15** (9.301)	−20.27** (9.113)	46.67*** (11.48)	47.44*** (11.50)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.0360	0.0353	0.238	0.241
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively. Descriptive statistics for the variables in this table can be found in Table A2. See Table A1 for variable definitions
Source: Table by authors

Table 2. Estimation results for sectors agriculture and industry

Dependent variable	Agriculture (1)	(2)	Industry (3)	(4)
LnGDP	−0.0435*** (0.0102)	−0.0428*** (0.0102)	−0.00383 (0.00838)	−0.00420 (0.00848)
Labor	0.741*** (0.150)	0.729*** (0.151)	−0.623*** (0.143)	−0.634*** (0.141)
RtIs	−0.0150 (0.981)		−0.609 (0.851)	
$RtIs_{t-1}$	0.145 (0.165)		0.198 (0.138)	
$RtIs_{t-2}$	0.145 (0.215)		0.319*** (0.105)	
$RtIs_{t-3}$	−0.534 (0.851)		0.808 (0.738)	
LnExport	−0.000308 (0.00302)	−0.000660 (0.00299)	0.00222 (0.00230)	0.00268 (0.00218)
RtBs		0.135 (0.791)		−0.689 (0.633)
$RtBs_{t-1}$		0.456* (0.254)		−0.428 (0.637)
$RtBs_{t-2}$		0.774 (0.469)		0.338 (0.206)
$RtBs_{t-3}$		0.891 (0.632)		0.270 (0.399)
Constant	40.92*** (10.47)	40.94*** (10.39)	41.32*** (10.17)	41.87*** (10.10)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.468	0.471	0.240	0.238
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and ***, respectively. Descriptive statistics for the variables in this table can be found in Table A2. See Table A1 for variable definitions
Source: Table by authors

Table 3. Estimation results for services and temporary females

Dependent variable	Services (1)	Services (2)	Temporary females (3)	Temporary females (4)
LnGDP	0.0473*** (0.00956)	0.0470*** (0.00947)	−0.112 (0.0957)	−0.110 (0.0939)
Labor	−0.117 (0.155)	−0.0944 (0.153)	0.570 (0.829)	0.613 (0.842)
RtIs	0.624 (0.603)		−19.18* (10.67)	
$RtIs_{t-1}$	−0.343** (0.154)		0.158 (0.967)	
$RtIs_{t-2}$	−0.464** (0.228)		9.889 (8.035)	
$RtIs_{t-3}$	−0.274 (0.774)		−2.211 (6.977)	
LnExport	−0.00191 (0.00282)	−0.00202 (0.00272)	0.00427 (0.0373)	0.00467 (0.0371)
RtBs		0.554 (1.236)		−17.92 (11.98)
$RtBs_{t-1}$		−0.0283 (0.511)		−0.546 (1.574)
$RtBs_{t-2}$		−1.112** (0.453)		−0.456 (0.985)
$RtBs_{t-3}$		−1.161 (0.730)		7.222** (3.634)
Constant	17.76 (11.57)	17.19 (11.45)	97.70 (70.53)	93.10 (68.97)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.611	0.612	0.0631	0.0665
Observations	4,069	4,069	1,184	1,184

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively. Descriptive statistics for the variables in this table can be found in Table A2. See Table A1 for variable definitions
Source: Table by authors

variable is represented as *LnGDP*. The second variable is the percentage of female participation in the labor force in relation to the total labor force. It is represented as *Labor*, and both *LnGDP* and *Labor* are sourced from The World Bank (2023b).

The third control variable is *LnExport*, the natural logarithm of the export value chain index (previous year = 100) multiplied by 100 and sourced from the World Trade Organization (2023). It is anticipated that a higher *LnGDP* is associated with higher speed of development and less discrimination [11]. Moreover, one can expect that *LnExport* has a mixed impact on lowering discrimination. Some studies argue that higher trade results in lower gender-related labor discrimination (Oostendorp, 2009; Reder, 1958; Wang, 2018; Schultz, 2014; Ben Yahmed and Bombarda, 2020; Berik *et al.*, 2004), while others disagree (Bøler *et al.*, 2018; Nikulin and Wolszczak-Derlacz, 2022).

The data set of trade agreements contains bilateral (between two parties) and plurilateral agreements [12]. In this sense, each country can have multiple trade agreements with one or a set of different countries at a given time. Based on the assumption that a single trade agreement with RtBs and RtIs makes the nation liable to promote gender equality, the dummy variables RtBs and RtIs for a given country take the value of one after the enforcement date of at least a single agreement with such references. These values do not change over time, assuming that the trade agreements last indefinitely, as by 2019, there has never been any case of trade sanctions for not imposing labor rights mentioned in trade agreements (Myant, 2022).

3.2 Main model

This study uses an economic model to understand the impact of the RtIs and RtBs on the discussed gender equality measures of a nation. The methodology is based on six different equations, each representing a unique dependent variable related to gender equality. These variables include *Salaried Gap*, *Vulnerable Females*, *Agriculture*, *Industry*, *Services* and

Temporary. The independent variables in all equations are *LnGDP* and *LnExport*, which control for the impact of income and export growth on the gender equality measures. Equation (2) summarizes these different equations into one equation:

$$\begin{aligned} Y_{ct} = {} & \alpha_0 + \alpha_1 \cdot LnGDP_{ct} + \alpha_2 \cdot Labor_{ct} + \alpha_3 \cdot LnExp_{ct} \\ & + \alpha_4 \cdot Ref_{ct} + \alpha_5 \cdot Ref_{t-1ct} + \alpha_6 \cdot Ref_{t-2} \\ & + \alpha_7 \cdot Ref_{t-3ct} + \lambda_c + \gamma_t + \varepsilon_{ct}, \end{aligned} \tag{2}$$

where Y_{ct} can be any of the following variables: $Salaried\ Gap_{ct}$, $Vulnerable_{ct}$, $Agriculture_{ct}$, $Industry_{ct}$, $Services_{ct}$, $Temporary_{ct}$, and α_0, α_1, α_2, …, α_7 are the corresponding coefficients for each (Y_{ct}) and the error term (ε_{ct}) is different for each (Y_{ct}). Moreover, variable *Ref* denotes references. Ref_{t-1}, Ref_{t-2}, and Ref_{t-3} represent the lagged values of *Ref* after 1, 2 and 3 years, respectively. Furthermore, λ_c and γ_t are the country and year fixed effects, respectively. By including these fixed effects in the model, the analysis controls for all time-invariant differences between countries and for common shocks and trends over time. The variable *Ref* can be substituted by either RtIs or RtBs; however, to save space and avoid redundancy, the equation is written only once, with *Ref*. To clarify, *Ref* is a vector that signifies references that bind or influence, depending on the analysis's context. The coefficients associated with the lagged values of *Ref* display how the references impact the dependent variables dynamically over time. This is because countries may need time to adapt their labor regulations and rules accordingly.

4. Results and discussion

In this chapter the discussion begins with Table 1, highlighting the impact of *Ref* on the gap between the number of men and women in paid employment (*Salaried Gap*), and female vulnerable employment (*Vulnerable Females*). Furthermore, Tables 2 and 3 provide insights into the effect of *Ref* on sector-specific employment trends within agriculture, industry and services, as well as the employment dynamics (share of female temporary employees as a percentage of total employees). Table 1 presents the results of equation (2) when Y_{ct} represents $Salaried_{ct}$ and $Vulnerable_{ct}$. The table is divided into four columns. The coefficients of interest are those related to RtBs and RtIs and their lagged values. Similarly, Tables 2 and 3 provide the outcomes for equation (2) when Y_{ct} is *Agriculture*, *Industry*, *Services* and *Temporary*, respectively. Throughout these tables, the term *Ref* is replaced with RtIs in columns (1) and (3), and with RtBs in columns (2) and (4).

Table 1 shows that implementing RtIs is initially negatively associated to the gap between the number of salaried male and female workers. However, after three years, the gender gap widens even further (in a larger magnitude than its initial decrease). This finding suggests that implementing RtIs might not only be less effective than RtBs in achieving gender equality goals, but could potentially have detrimental consequences for these efforts. On the other hand, RtBs decrease the gender gap after one period, as evidenced by the negative and statistically significant coefficient. These results align with expectations, as the enforcing language related to RtIs may appear in text parts that are not legally binding. Moreover, columns (3) and (4) of Table 1 show that RtBs increase the number of vulnerable female employments. These results are in line with expectations. Higher enforcement mechanisms of legally binding locations and language increase the cost of having salaried female employees and, hence, the portion of vulnerable female employees augments. The results continue to support the effectiveness of RtBs relative to RtIs in Table 2. Columns (1) and (2) of Table 2 show that references appearing in legally binding locations (RtBs) increase the percentage of female workers in the agriculture sector one year after their implementation. In

contrast, using modal verbs related to gender equality (RtIs) is not correlated to the percentage of female employees in this sector. In this table, columns (3) and (4) show that both RtIs and RtBs increase the number of female workers in the industry sector after two periods, even though these effects are not statistically significant in the case of RtBs.

According to the ILO, the service sector includes industries such as wholesale and retail trade, restaurants and hotels, transport, storage, communication, finance, insurance, real estate and business services, as well as community, social and personal services. These industries focus more on indirect trade, such as providing value-added work for exporting industries, rather than direct trade (exporting and importing). As a result, they are not directly impacted by trade agreements. Estimation results shown in columns (1) and (2) of Table 3 provide support for the notion that a proportion of women in the workforce shifts from the service sector to the agriculture and industry sectors. This is likely because labor provisions in trade agreements may not extend to regulations in the service sector, as this sector does not engage in direct trade with other countries. Therefore, female workers may find better opportunities in the agriculture and industry sectors, where gender equality regulations are enforced. In Table 3, columns (3) and (4) demonstrate how RtIs and RtBs affect temporary employment. It is worth noting that temporary employment is preferable to no employment. The findings reveal that RtIs decrease temporary employment without delays, while RtBs increase temporary employment with a lag of three years. Combining these results with those in columns (1) and (2) of Table 1, we can conclude that RtBs narrow the gap in the number of salaried employees between men and women, with part of the decrease occurring in temporary rather than permanent employment. This makes sense as temporary employment is less expensive for employers and can fulfill some gender equality goals within RtBs. On the other hand, RtIs widen the gap in salaried employment between men and women since their legal enforceability is questionable, and they also decrease the number of female temporary employees.

In these tables, the coefficients of RtBs and RtIs show the typical variation in the percentage of dependent variables when these references are present compared to when they are absent. This means that the coefficient value indicates the average increase in the gender equality rate for countries with RtIs and RtBs. For example, the interpretation of the results based on Table 1 is that RtBs reduce the gender gap for salaried workers by approximately 1.2 percentage points after one year. Similarly, the coefficients of RtIs can be interpreted in these tables.

The coefficient related to the variable *Labor* is interpreted differently, as this independent variable represents females as a percentage of total employment. As an example, the regression results presented in columns (1) and (2) of Table 2 can be interpreted. In this case, the coefficient of 0.741 suggests that for every 1% increase in females as a percentage of the total labor force, the portion of female employees in the agriculture sector as a percentage of total female employment increases by 0.7%. For example, if females make up 30% of the entire labor force and females employed in the agriculture sector make 20% of total female employment, an increase in the female labor force participation to 31% (a 1% increase) would be associated with 20.7% in female employees in the agriculture sector. This positive relationship suggests that as more women enter the labor force, there may be an increase in the portion employed in the agriculture sector compared to all women employed in other sectors.

In these tables, it is notable that the coefficient of variable *LnExp* is not significant in any of the estimations, which contradicts much of the discussed literature that highlights the role of trade in reducing gender inequalities. However, this lack of significance could be attributed to the fact that the impact of references was separately captured in these

regressions. Conversely, the coefficients of *LnGDP* prove significant in columns (1) and (2) of Tables 1–3. The coefficients related to *LnGDP* of Tables 2 and 3 reveal that with a 1% increase in *LnGDP*, the proportion of females hired in the service sector relative to all female employment increases by 0.047 percentage points while the proportion of females hired in the agriculture sector decreases by 0.043 percentage points. Therefore, these results indicate that as countries become wealthier, women tend to work more in the service sector than the agriculture sector.

4.1 Additional results

To incorporate the Kuznet concept into the original estimations presented in Tables 1–3, a quadratic term for *LnGDP* (*LnGDP*2) has been incorporated in the existing models and the results are presented in Appendix 6. Therefore, Tables 1–3 can be directly compared with Tables A3–A5, respectively. This adjustment is inspired by the Kuznet curve hypothesis, suggesting an inverted U-shaped relationship between inequality and economic development. Based on this hypothesis, the inequality is expected to increase with GDP during the initial stages of GDP growth and then decrease beyond a certain point of development. By inclusion of the quadratic term of *LnGDP*, the models are better equipped to capture this potential nonlinearity in the data set. The results in Tables A3−A5 provide robustness to the original estimations except in two cases. First, by comparing column (3) of Table 1 with Table A3, it is evident that after the inclusion of *LnGDP*2, the coefficient for RtIs with a three-period lag becomes significant. Furthermore, a comparison of columns (3) and (4) in Table A4 with those of Table 2 shows that RtIs and RtBs increase the number of female workers in the industry sector after two periods, however, these effects are statistically significant for RtBs but not RtIs when including *LnGDP*2 as opposed to the original estimations.

The inclusion of *LnGDP*2 alongside *LnGDP* introduces the issue of multicollinearity due to the high correlation between the two variables. Therefore, the model is adjusted to replace *LnGDP* with *LnGDP*2 to see how the results would differ without the mentioned multicollinearity. *LnGDP*2 is no longer statistically significant in columns (1), (2) and (3) in Table A6 compared to Table A3. The coefficient and statistical significance of RtIs and RtBs reported in columns (3) and (4) of Table A6 are now similar to the original estimations in Table 1. Moreover by comparing the results of Table A7 and Table 2, it can be seen that RtIs have a positive and statistically significant association in the industry sector after two periods much like the original estimations. Therefore, the original estimations stay robust when *LnGDP* is replaced with *LnGDP*2.

5. Conclusions

This study addressed the issue of how to incorporate gender-related provisions in trade agreements and related documents. While there has been an increase in such provisions over time, the focus was not on whether they should be included, but rather on the best way to include them. The key takeaways from this study are that the RtIs require further scrutiny and modifications to enhance their efficacy. Even though RtIs are mainly implemented to directly address gender equality issues, their location of appearance and associated modal verbs negatively impact their efficacy. Results show that RtBs perform better than RtIs, as they are related to more legally binding locations and languages, even though they may not address gender equality directly. This may be due to more enforceable mechanisms to ensure the proper implementation of these references compared to RtIs. This study, which used data from multiple sources, revealed a mixed efficacy of the gender references under investigation. This disparity in outcomes underscores the complexity of the issue and the necessity for a careful approach to implementing these references after their appearance in trade agreements.

As a policy recommendation, the findings encourage the officials and trade unions that play a role in setting up these trade agreements to place references related to gender equality (whether directly or indirectly) in the binding sections of trade agreements and related documents and to use hard modal words, such as "shall" or "should" rather than soft modal words, such as "may" and "might". This would allow continuous monitoring by the ILO, improvement through dispute settlement mechanisms, and allow trade unions to bring about legal actions against nations that do not comply with these references. Furthermore, gender provisions do not address specific sectors. However, the results of this paper show that RtBs matter more in agriculture and, therefore, they should cater more toward agriculture sectors where women are mainly employed.

While this study provides significant insights into the relationship between labor provisions in trade agreements and various aggregated gender equality measures, the analysis could be extended to include more disaggregated data. This would allow for a more detailed examination of gender equality, for example, by analyzing the wage gap between men and women working for specific firms in developing countries that are affected by these trade agreements.

Notes

1. For example, the US-Vietnam Bilateral Trade Agreement can be highlighted. The main policy change in this agreement was the reduction of taxes by the US. As a result, there was an increase in demand for labor in the formal sector, which encouraged workers to move from informal microenterprises to the formal sector, providing them with better job opportunities (Pavcnik, 2017).
2. The EU's trade policy is to help developing countries boost their production, diversify their economy and infrastructure, and improve their governance through sound domestic policies so that the poor benefit from trade-led growth and make sure their development is for the long term (European Union, 2023).
3. Based on Myant (2022), the US-Guatemala case, is the only one that ran its entire course, taking nine years from the submission of a complaint by trade unions to the final verdict by a panel of experts.
4. The separation between developing and developed countries within the data set is visualized in Figure A1.
5. However, gender-related provisions tend to fail to address specific sectors like agriculture, which are of greater significance to women (Kuhlmann and Bahri, 2023).
6. Substance-related labor obligations are legal duties that shall guide states' conduct (Corley-Coulibaly *et al.*, 2022).
7. Procedural obligations focus on how to enforce rights and duties, which can be through dialogue, cooperation, or information transparency (Corley-Coulibaly *et al.*, 2022).
8. According to Bourgeois *et al.* (2007), "The preamble to an FTA does not contain any binding obligations upon the parties. The statements contained in the preambles are not intended to be operative provisions in the sense of creating specific rights or obligations. Rather, the preamble statements offer a context for the signatories' overall objectives by introducing the agreement, setting out the motives of the contracting parties and the objectives to be accomplished by the provisions of the statutes."
9. Referring to Vienna Convention on the Law of the Treaties (1969), Section 3: Interpretation of Treaties, Article 31(2): "The context for the purpose of the interpretation of a treaty shall comprise, in addition to the text, including its preamble and annexes: (a) any agreement relating to the treaty which was made between all the Parties in connection with the conclusion of the treaty; (b) any instrument which was made by one or more Parties in connection with the conclusion of the treaty and accepted by the other Parties as an instrument related to the treaty."

10. The list of developing countries is sourced from United Nations Statistics Division (2023).
11. It can also be seen from Appendix 5 that on average *Salaried Gap* is higher in developing countries than in developed countries.
12. Plurilateral agreements are those between a limited set of countries.
13. The language in this case does not pass the requirement of the coding rule of RtIs in the LP Hub database.
14. These are not considered RtBs, as it is not a binding commitment.

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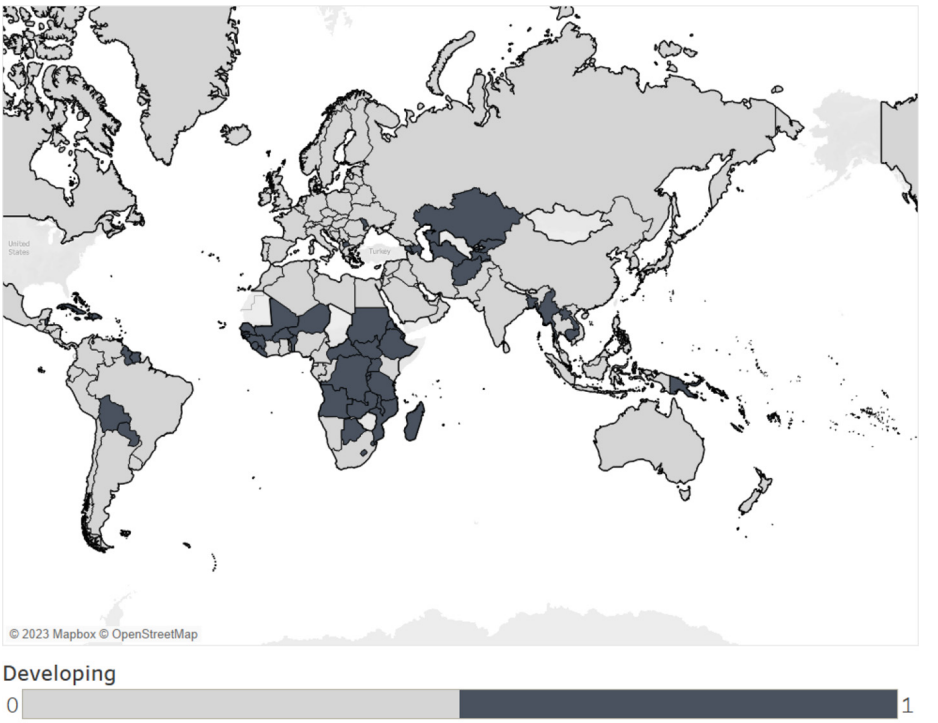
Appendix 1. Developed and developing nations



Sources: Figure is created by authors. The separation between developed and developing countries is inspired by data from United Nations Statistics Division (2023)

Figure A1. Illustration of the list of developing countries on the map

Appendix 2

Table A1. Variable definitions

Salaried gap	The gap between the number of men and women in paid employment as a percentage of employment by gender
Vulnerable females	Sum number of female contributing family workers and own-account workers as a percentage of total employment
Agriculture	Female employment in agriculture as a percentage of female employment
Industry	Female employment in industry as a percentage of female employment
Services	Female employment in services as a percentage of female employment
LnGDP	Natural logarithm of GDP per capita, which is converted to US dollars using Purchasing Power Parity factors and multiplied by 100 *
Labor	The percentage of female participation in the labor force in relation to the total labor force
LnExp	The natural logarithm of the merchandise export index (previous year = 100) multiplied by 100
RtBs	References that Bind (a dummy variable) *
RtIs	References that Influence (a dummy variable) *

Note: *Refer to section 3 for a detailed explanation of the variable
Source: Table by authors

Appendix 3

Table A2. Descriptive analysis

Variable	Mean	SD	Min	Max
Salaried gap	1.6	10.3	−33.5	30.1
Vulnerable females	41.7	32.5	0.0	99.0
Agriculture	27.5	27.4	0.0	97.0
Industry	12.7	8.1	0.2	59.0
Services	59.7	25.8	2.4	98.1
LnGDP	900.9	125.6	565.0	1200.3
Labor	40.6	9.6	10.3	54.1
LnExp	466.0	27.4	−39.6	810.4

Notes: SD = standard deviation; Min and Max = minimum and maximum values, respectively
Source: Table by authors

Appendix 4. Examples of RtBs and RtIs

Example 1. The following text is derived from Article 13.4 "Multilateral labour standards and agreement" and Annex 13 "Cooperation on trade and sustainable development" of the EU–Korea Republic trade agreement, representing both RtBs and RtIs:

"1. The Parties recognise the value of international cooperation and agreements on employment and labour affairs as a response of the international community to economic, employment and social challenges and opportunities resulting from globalisation. They commit to consulting and cooperating as appropriate on trade-related labour and employment issues of mutual interest.

2. The Parties reaffirm the commitment, under the 2006 Ministerial Declaration of the UN Economic and Social Council on Full Employment and Decent Work, to recognising full and productive employment and decent work for all as a key element of sustainable development for all countries and as a priority objective of international cooperation and to promoting the development of international trade in a way that is conducive to full and productive employment and decent work for all, including men, women and young people.

3. The Parties, in accordance with the obligations deriving from membership of the ILO and the ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up, adopted by the International Labour Conference at its 86th Session in 1998, commit to respecting, promoting and realising, in their laws and practices, the principles concerning the fundamental rights, namely:

(a) freedom of association and the effective recognition of the right to collective bargaining;

(b) the elimination of all forms of forced or compulsory labour;

(c) the effective abolition of child labour; and

(d) the elimination of discrimination in respect of employment and occupation.

The Parties reaffirm the commitment to effectively implementing the ILO Conventions that Korea and the Member States of the European Union have ratified respectively. The Parties will make continued and sustained efforts towards ratifying the fundamental ILO Conventions as well as the other Conventions that are classified as "up-to-date" by the ILO." (Article 13.4)

"1. In order to promote the achievement of the objectives of Chapter Thirteen and to assist in the fulfilment of their obligations pursuant to it, the Parties have established the following indicative list of areas of cooperation:

(a) exchange of views on the positive and negative impacts of this Agreement on sustainable development and ways to enhance, prevent or mitigate them, taking into account sustainability impact assessments carried out by the Parties;

(b) cooperation in international fora responsible for social or environmental aspects of trade and sustainable development, including in particular the WTO, the ILO, the United Nations Environment Programme and multilateral environmental agreements;

(c) cooperation with a view to promoting the ratification of fundamental and other ILO Conventions and multilateral environmental agreements with an impact on trade;

(d) exchange of information and cooperation on corporate social responsibility and accountability, including on the effective implementation and follow-up of internationally agreed guidelines, fair and ethical trade, private and public certification and labelling schemes including eco-labelling and green public procurement;

(e) exchange of views on the trade impact of environmental regulations, norms and standards;

(f) cooperation on trade-related aspects of the current and future international climate change regime, including issues relating to global carbon markets, ways to address adverse effects of trade on climate, as well as means to promote low-carbon technologies and energy efficiency;

(g) cooperation on trade-related aspects of biodiversity including in relation to biofuels;

(h) cooperation on trade-related measures to promote sustainable fishing practices;

(i) cooperation on trade-related measures to tackle the deforestation including by addressing problems regarding illegal logging;

(j) cooperation on trade-related aspects of multilateral environmental agreements, including customs cooperation;

(k) cooperation on trade-related aspects of the ILO Decent Work Agenda, including on the interlinkages between trade and full and productive employment, labour market adjustment, core labour standards, labour statistics, human resources development and life-long learning, social protection and social inclusion, social dialogue and gender equality;

(l) exchange of views on the relationship between multilateral environmental agreements and international trade rules; or

(m) other forms of environmental cooperation as the Parties may deem appropriate.

2. The Parties agree that it would be desirable if cooperative activities developed by them could have as broad an application and benefit as possible." (Annex 13)

Example 2. The following text is derived from Chapter 5, Article 5.4 "Multilateral labour standards and agreements" and Article 5.10 "Cooperation" of the parallel agreement ("framework agreement") related to the Republic of Korea – Türkiye trade agreement, which is a legally binding agreement that represents RtBs and RtIs:

"1. The Parties recognise the value of international cooperation and agreements on employment and labour affairs as a response of the international community to economic, employment and social challenges and opportunities resulting from globalisation. They commit to consulting and cooperating as appropriate on trade-related labour and employment issues of mutual interest.

2. The Parties reaffirm the commitment, under the 2006 Ministerial Declaration of the UN Economic and Social Council on Full Employment and Decent Work, to recognising full and productive employment and decent work for all as a key element of sustainable development for all countries and as a priority objective of international cooperation and to promoting the development of international trade in a way that is conducive to full and productive employment and decent work for all, including men, women and young people.

3. The Parties, in accordance with the obligations deriving from membership of the ILO and the ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up, adopted by the International Labour Conference at its 86th Session in 1998, commit to respecting, promoting and realising, in their laws and practices, the principles concerning the fundamental rights, namely:

(a) freedom of association and the effective recognition of the right to collective bargaining;

(b) the elimination of all forms of forced or compulsory labour;

(c) the effective abolition of child labour; and

(d) the elimination of discrimination in respect of employment and occupation.

4. The Parties reaffirm the commitment to effectively implementing the ILO Conventions that Turkey and Korea have ratified respectively." (Article 5.4)

"2. In order to promote the achievement of the objectives of this Chapter and to assist in the fulfilment of their obligations pursuant to it, the Parties have established the following indicative list of areas of cooperation:

(a) exchange of views on the positive and negative impacts of the Korea-Turkey FTA on sustainable development and ways to enhance, prevent or mitigate them, taking into account sustainability impact assessments carried out by the Parties;

(b) cooperation in international fora responsible for social or environmental aspects of trade and sustainable development, including in particular the WTO, the ILO, the United Nations Environment Programme and multilateral environmental agreements;

(c) cooperation with a view to promoting the ratification of fundamental and other ILO Conventions and multilateral environmental agreements with an impact on trade;

(d) exchange of information and cooperation on corporate social responsibility and accountability, including on the effective implementation and follow-up of internationally agreed guidelines, fair and ethical trade, private and public certification and labelling schemes including eco-labelling, and green public procurement;

(e) exchange of views on the trade impact of environmental regulations, norms and standards;

(f) cooperation on trade-related aspects of the current and future international climate change regime, including issues relating to global carbon markets, ways to address adverse effects of trade on climate, as well as means to promote low-carbon technologies and energy efficiency;

(g) cooperation on trade-related aspects of biodiversity including in relation to biofuels;

(h) cooperation on trade-related measures to promote sustainable fishing practices;

(i) cooperation on trade-related measures to tackle deforestation including by addressing problems regarding illegal logging;

(j) cooperation on trade-related aspects of multilateral environmental agreements, including customs cooperation;

(k) cooperation on trade-related aspects of the ILO Decent Work Agenda, including on the inter-linkages between trade and full and productive employment, labour market adjustment, core labour standards, labour statistics, human resources development and life-long learning, social protection and social inclusion, social dialogue and gender equality" (Article 5.10)

Example 3. The following example is from Article 17.5 "Definiciones" of the Colombia–Chile FTA, showing RtBs but not RtIs:

"Para efectos de este Capítulo: Por legislación nacional se entiende leyes o regulaciones de cada Parte, o disposiciones de las mismas, que estén directamente relacionadas con los siguientes derechos internacionalmente reconocidos:

(a) el derecho de asociación;

(b) el derecho de organizarse y negociar colectivamente;

(c) la prohibición del uso de cualquier forma de trabajo forzoso u obligatorio;

(d) una edad mínima para el empleo de niños, y la prohibición y eliminación de las peores formas de trabajo infantil;

(e) la eliminación de la discriminación en materia de empleo y ocupación; y

(f) condiciones aceptables de trabajo respecto a salarios mínimos, horas de trabajo y seguridad y salud ocupacional."

Example 4. The following example is from Chapter 16 (Trade And Labour) of the core text in "New Zealand–Chinese Taipei" (also referred to as "New Zealand–Taiwan, China") agreement representing RtBs but not RtIs [13]:

"Each Party shall respect, promote and recognise in its laws, regulations, policies and practices, the following internationally recognised fundamental labour principles and rights:
(a) freedom of association and the effective recognition of the right to collective bargaining;
(b) the elimination of all forms of forced or compulsory labour;

(c) the effective abolition of child labour; and
(d) the elimination of discrimination in respect of employment and occupation."

Example 5. The following example is from Article 11 "Cooperative Activities" of the parallel agreement (not core agreement) of the "North American Free Trade Agreement (NAFTA)" representing RtIs but not RtBs [14]:

"1. The Council shall promote cooperative activities between the Parties, as appropriate, regarding:

(a) occupational safety and health;
(b) child labor;
(c) migrant workers of the Parties;
(d) human resource development;
(e) labor statistics;
(f) work benefits; (g) social programs for workers and their families;
(h) programs, methodologies and experiences regarding productivity improvement;
(i) labor-management relations and collective bargaining procedures;
(j) employment standards and their implementation;
(k) compensation for work-related injury or illness;
(l) legislation relating to the formation and operation of unions, collective bargaining and the resolution of labor disputes, and its implementation;
(m) the equality of women and men in the workplace;
(n) forms of cooperation among workers, management and government;
(o) the provision of technical assistance, at the request of a Party, for the development of its labor standards; and
(p) such other matters as the Parties may agree.

2. In carrying out the activities referred to in paragraph 1, the Parties may, commensurate with the availability of resources in each Party, cooperate through:

(a) seminars, training sessions, working groups and conferences;
(b) joint research projects, including sectoral studies;
(c) technical assistance; and
(d) such other means as the Parties may agree.

3. The Parties shall carry out the cooperative activities referred to in paragraph 1 with due regard for the economic, social, cultural and legislative differences between them."

Example 6. The following text is derived from of Article 44 "Social cooperation" and Article 45 "Cooperation related to gender" of EU–Chile core agreement, that consists of RtIs but not RtBs:

"1. The Parties recognise the importance of social development, which must go hand in hand with economic development. They will give priority to the creation of employment and respect for fundamental social rights, notably by promoting the relevant conventions of the International Labour Organisation covering such topics as the freedom of association, the right to collective bargaining and non-discrimination, the abolition of forced and child labour, and equal treatment between men and women.

2. Cooperation may cover any area of interest to the Parties.

3. Measures may be coordinated with those of the Member States and the relevant international organisations.

4. The Parties will give priority to measures aimed at:

(a) promoting human development, the reduction of poverty and the fight against social exclusion, by generating innovative and reproducible projects involving vulnerable and marginalised social sectors. Special attention will be paid to low-income families and disabled persons;

(b) promoting the role of women in the economic and social development process and promoting specific programmes for youth;

(c) developing and modernising labour relations, working conditions, social welfare and employment security;

(d) improving the formulation and management of social policies, including social housing, and improving access by beneficiaries;

(e) developing an efficient and equitable health system, based on solidarity principles;

(f) promoting vocational training and development of human resources;

(g) promoting projects and programmes which generate opportunities for the creation of employment within micro-, small and medium-sized enterprises;

(h) promoting programmes of land management with special attention to areas with higher social and environmental vulnerability;

(i) promoting initiatives contributing to social dialogue and the creation of consensus; and

(j) promoting respect for human rights, democracy and citizens' participation." (Article 44)

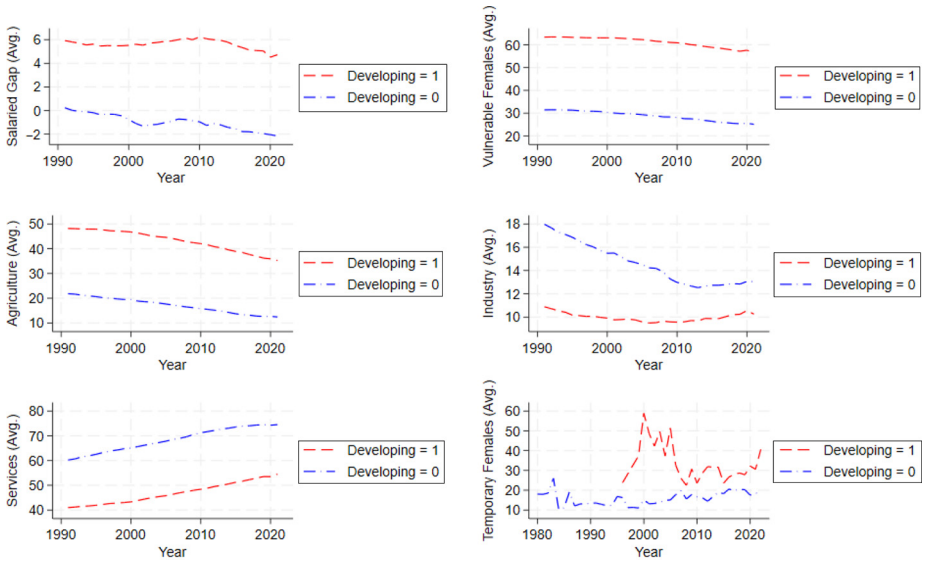
"1. Cooperation will contribute to strengthening policies and programmes that improve, guarantee and extend the equitable participation of men and women in all sectors of political, economic, social and cultural life. Cooperation will contribute to easing women's access to all necessary resources for the full exercise of their fundamental rights.

2. In particular, cooperation should promote the creation of an adequate framework to:

(a) ensure that gender and gender-related issues can be taken into account at every level and in all areas of cooperation including macroeconomic policy, strategy and development operations; and

(b) promote the adoption of positive measures in favour of women." (Article 45)

Appendix 5. Time series graphs



Sources: Figure is created by authors, inspired by data from International Labour Organization (2021, 2023); and United Nations Statistics Division (2023)

Figure A2. Time series of averages of variables for two groups of developed and developing countries

Appendix 6. The concept of the Kuznets curve

Table A3. Inclusion of *LnGDP*2

Dependent variable	Salaried gap (1)	(2)	Vulnerable females (3)	(4)
LnGDP	0.113*** (0.0341)	0.118*** (0.0334)	−0.113** (0.0472)	−0.0960* (0.0511)
LnGDP2	−0.0000529*** (0.0000184)	−0.0000561*** (0.0000179)	0.0000522** (0.0000244)	0.0000431 (0.0000263)
Labor	0.276** (0.110)	0.290*** (0.109)	0.227 (0.141)	0.207 (0.142)
RtIs	−1.038* (0.540)		−0.803 (1.111)	
$RtIs_{t-1}$	−0.0999 (0.150)		0.118 (0.193)	
$RtIs_{t-2}$	0.156 (0.255)		0.116 (0.210)	
$RtIs_{t-3}$	0.994** (0.474)		1.532** (0.621)	
LnExport	0.000924 (0.00182)	0.00134 (0.00180)	0.00387* (0.00231)	0.00419* (0.00221)
RtBs		−1.449 (1.002)		1.008 (0.667)
$RtBs_{t-1}$		−1.168** (0.479)		0.0972 (0.539)
$RtBs_{t-2}$		0.437 (0.501)		0.647** (0.306)
$RtBs_{t-3}$		0.395 (0.557)		0.630 (0.795)
Constant	−66.47*** (18.45)	−68.67*** (18.18)	91.47*** (24.79)	84.61*** (26.29)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.0568	0.0607	0.247	0.248
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors

Table A4. Inclusion of *LnGDP*2

Dependent variable	Agriculture (1)	(2)	Industry (3)	(4)
LnGDP	−0.257*** (0.0532)	−0.243*** (0.0556)	0.289*** (0.0415)	0.275*** (0.0413)
LnGDP2	0.000119*** (0.0000278)	0.000111*** (0.0000293)	−0.000163*** (0.0000219)	−0.000156*** (0.0000217)
Labor	0.517*** (0.154)	0.496*** (0.155)	−0.316** (0.122)	−0.309** (0.123)
RtIs	−0.113 (0.868)		−0.475 (0.613)	
$RtIs_{t-1}$	0.220 (0.163)		0.0946 (0.122)	
$RtIs_{t-2}$	0.304 (0.223)		0.102 (0.0997)	
$RtIs_{t-3}$	0.711 (0.791)		−0.895 (0.663)	
LnExport	0.00112 (0.00308)	0.00130 (0.00300)	0.000263 (0.00212)	−0.0000565 (0.00199)
RtBs		0.0244 (0.750)		−0.534 (0.676)
$RtBs_{t-1}$		0.392* (0.234)		−0.339 (0.577)
$RtBs_{t-2}$		0.765* (0.446)		0.351* (0.185)
$RtBs_{t-3}$		1.075* (0.590)		0.0132 (0.353)
Constant	142.8*** (28.27)	137.0*** (29.02)	−98.18*** (21.35)	−92.33*** (21.47)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.500	0.501	0.385	0.382
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors

Table A5. Inclusion of *LnGDP*2

Dependent variable	Services (1)	Services (2)	Temporary females (3)	Temporary females (4)
LnGDP	−0.0315 (0.0404)	−0.0325 (0.0395)	−0.280 (0.555)	−0.290 (0.543)
LnGDP2	0.0000438* (0.0000228)	0.0000443** (0.0000222)	0.0000870 (0.000254)	0.0000939 (0.000250)
Labor	−0.200 (0.159)	−0.187 (0.158)	0.529 (0.752)	0.562 (0.757)
RtIs	0.588 (0.588)		−18.59* (10.00)	
$RtIs_{t-1}$	−0.315** (0.152)		0.157 (0.956)	
$RtIs_{t-2}$	−0.406* (0.224)		10.67 (8.384)	
$RtIs_{t-3}$	0.184 (0.756)		−2.819 (7.086)	
LnExport	−0.00139 (0.00271)	−0.00124 (0.00261)	0.00684 (0.0405)	0.00768 (0.0405)
RtBs		0.510 (1.252)		−17.38 (11.32)
$RtBs_{t-1}$		−0.0537 (0.495)		−0.614 (1.502)
$RtBs_{t-2}$		−1.116** (0.460)		−0.330 (1.034)
$RtBs_{t-3}$		−1.088 (0.740)		7.261** (3.613)
Constant	55.34** (21.50)	55.35** (21.31)	178.4 (276.0)	179.8 (268.5)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.614	0.615	0.0642	0.0677
Observations	4,069	4,069	1,184	1,184

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors

Table A6. Replacing *LnGDP* with *LnGDP*2

Dependent variable	Salaried gap (1)	Salaried gap (2)	Vulnerable females (3)	Vulnerable females (4)
LnGDP2	0.00000725 (0.00000469)	0.00000622 (0.00000463)	−0.00000762 (0.00000654)	−0.00000770 (0.00000659)
Labor	0.153 (0.104)	0.149 (0.104)	0.349** (0.144)	0.322** (0.150)
RtIs	−1.008* (0.541)		−0.832 (1.191)	
$RtIs_{t-1}$	−0.0601 (0.144)		0.0781 (0.200)	
$RtIs_{t-2}$	0.238 (0.241)		0.0330 (0.218)	
$RtIs_{t-3}$	1.583*** (0.524)		0.946 (0.681)	
LnExport	0.00186 (0.00191)	0.00269 (0.00198)	0.00293 (0.00238)	0.00309 (0.00230)
RtBs		−1.547 (0.999)		1.088* (0.655)
$RtBs_{t-1}$		−1.211** (0.503)		0.132 (0.526)
$RtBs_{t-2}$		0.452 (0.502)		0.634** (0.305)
$RtBs_{t-3}$		0.467 (0.572)		0.571 (0.797)
Constant	−10.22* (5.699)	−9.627* (5.547)	35.44*** (6.818)	36.50*** (6.881)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.0287	0.0277	0.234	0.237
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors

Table A7. Replacing *LnGDP* with *LnGDP*2

Dependent variable	Agriculture (1)	(2)	Industry (3)	(4)
LnGDP2	−0.0000176*** (0.00000534)	−0.0000171*** (0.00000541)	−0.00000948** (0.00000429)	−0.00000989** (0.00000428)
Labor	0.796*** (0.153)	0.786*** (0.156)	−0.630*** (0.140)	−0.639*** (0.139)
RtIs	−0.180 (1.033)		−0.400 (0.856)	
$RtIs_{t-1}$	0.130 (0.167)		0.196 (0.138)	
$RtIs_{t-2}$	0.116 (0.210)		0.313*** (0.109)	
$RtIs_{t-3}$	−0.625 (0.834)		0.604 (0.734)	
LnExport	−0.00101 (0.00303)	−0.00147 (0.00299)	0.00266 (0.00230)	0.00308 (0.00216)
RtBs		0.226 (0.805)		−0.763 (0.662)
$RtBs_{t-1}$		0.480* (0.257)		−0.438 (0.629)
$RtBs_{t-2}$		0.734 (0.464)		0.386* (0.213)
$RtBs_{t-3}$		0.926 (0.605)		0.182 (0.408)
Constant	15.09** (7.055)	15.27** (7.076)	45.21*** (7.064)	45.69*** (6.945)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.456	0.458	0.250	0.249
Observations	4,069	4,069	4,069	4,069

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors

Table A8. Replacing *LnGDP* with *LnGDP*2

Dependent variable	Services (1)	(2)	Temporary females (3)	(4)
LnGDP2	0.0000271*** (0.00000528)	0.0000270*** (0.00000521)	−0.0000534 (0.0000432)	−0.0000520 (0.0000424)
Labor	−0.166 (0.151)	−0.148 (0.148)	0.604 (0.861)	0.652 (0.878)
RtIs	0.580 (0.587)		−19.71* (11.04)	
$RtIs_{t-1}$	−0.326** (0.152)		0.183 (0.987)	
$RtIs_{t-2}$	−0.429* (0.225)		9.317 (7.723)	
$RtIs_{t-3}$	0.0208 (0.761)		−1.833 (6.647)	
LnExport	−0.00165 (0.00279)	−0.00161 (0.00270)	0.00253 (0.0368)	0.00280 (0.0365)
RtBs		0.537 (1.246)		−18.37 (12.35)
$RtBs_{t-1}$		−0.0419 (0.500)		−0.503 (1.604)
$RtBs_{t-2}$		−1.120** (0.459)		−0.618 (1.008)
$RtBs_{t-3}$		−1.108 (0.741)		7.207* (3.710)
Constant	39.71*** (7.895)	39.04*** (7.757)	38.81 (35.31)	34.96 (35.60)
Year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
R^2	0.614	0.615	0.0614	0.0647
Observations	4,069	4,069	1,184	1,184

Notes: Clustered robust standard errors (by country) are indicated in parentheses. *P*-values below 0.1, 0.05 and 0.01 are marked with *, ** and *** respectively
Source: Table by authors