LINKAGES BETWEEN REGIONAL TRADE AGREEMENTS AND ENVIRONMENTAL AND LABOUR MARKET OUTCOMES

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Sanchita Roy Chowdhury

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Thesis Advisory Committee

Prof. Siddhartha K. Rastogi
[Chairman]

Prof. Ajay Sharma   Prof. Deepak Sethia
[Member]   [Member]

Abstract

Regional Trade Agreements (RTAs) have proliferated in the second half of the last century and covers majority of the world trade today. The World Trade Organization (WTO) facilitates the trade agreements to take place and provides various provisions covering environmental, labour, financial and social aspects in RTAs. Countries may include one or more of such provisions in their trade agreements, depending upon their needs. According to the participating countries' discretion, these provisions may be binding or non-binding.

Environmental issues have been a top priority globally in the last three decades. It is often argued that developed countries focus on greening the economy, but developing countries aim to grow the economy at the cost of the environment (Morin et. al., 2018). There have been several studies conducted which associate trade volume and pattern with the environment. But a few studies have related RTAs with environmental outcomes. The existing limited study which has related environmental provisions in RTAs with the environmental conditions in the past have mainly focused on emission of pollutants (Baghdadi et. al., 2013; Martinez-Zarzoso et. al., 2016; Zhou, et. al., 2017). No studies have been conducted on other sources of environmental pollution. In our first study, we aim to bridge this gap in literature. We carry out an analysis to directly relate the impact of including environmental provisions in RTAs on various environmental factors, such as rate of tree cover loss, use of fossil fuel, number of marine protected areas, and number of terrestrial protected areas. We use country pair fixed effects model to carry out our analysis.

Our results indicate that inclusion of environmental provision in RTAs are partially beneficial. It causes convergence between country pairs in terms of tree cover loss and marine protected areas, but does not have a significant impact on fossil fuel consumption and terrestrial protected areas.

Labour issues has been another issue of global concern over the years. The International Labour Organisation (ILO) has undertaken various measures to prevent exploitation of the labour force for growing the economy. With the increase in the importance of labour issues globally, the literature relating labour standards and trade in also growing. With respect to 'decent work' agenda of ILO and trade, the existing studies primarily address two questions- Does inclusion of stringent labour laws and provisions impact trade intensity? and, does trade have any impact of the domestic labour market? Most of the studies try to empirically answer the former question (Brown, et. al., 1996; Maskus & Martin, 2001; Deheijia & Sammy, 2004) and a limited number of studies are conducted on the later question (Slaughter, 1998; Milner & Wright, 1998; Neumayer & de Soya, 2007). However, very few studies have till date addressed the impact of trade policies on labour standards. In our second study, we address the gap in literature pertaining to the labour market by studying the impact of including labour provision in RTAs on the exposure of workers to occupational carcinogens, occupational gases, fumes and particulate matter, and occupational noise.

From our analysis, we see that inclusion of labour provision in RTAs causes convergence in exposure to occupational carcinogens and occupational gases, fumes and particulate matter between countries. However, it does not impact exposure to occupational noise. Therefore, it can be concluded that inclusion of labour provisions in RTAs are partially beneficial.

Our results are in line with the results from literature. We find inclusion of provisions in the RTAs are largely beneficial. Our study is aimed for policy makers for taking holistic decisions while signing trade agreements, which helps both the environmental conditions and labour force.

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Appendix

Appendix-1: The equations for instrumental variables

We use the following equation to predict the income in the current period for each of the countries:

$$ln\ GDP_{pc_{it}} = \alpha_i + \beta1\ ln\ pop_{it} + \beta2\ ln\ GDP_{pc_{it-1}} + \beta3\ ln(\frac{I}{GDP})_{it} + \beta4\ ln\ s1_{it} +$$

$$\beta5\ ln\ s2_{it} + \beta6\ gr_{it} + \mu_{it} \dots\dots\dots\dots (4)$$

Where, $GDP_{pc_{it-1}}$ is the lagged income of the previous period, I/GDP is the investment as a ratio of income, s1 is the rate of primary school enrolment, s2 is the rate of secondary school enrolment, gr is the population growth rate.

The trade openness and bilateral trade flows can be determined by the gravity model. Following Badinger's (2008) gravity model, trade between two countries is positively influenced by population size, the income or GDP of the country, the land area and negatively influenced by the geographical distance and the cultural distance or the language spoken in the two countries. Therefore, the variable openness is predicted using regression with bilateral trading ((import+export)/total GDP) as a dependent variable and population, land area, distance, landlocked dummy, similarity in country size and remoteness of the country. We determine remoteness as determined by creating a dummy which takes a value of 0 if the countries are in the same continent, else 1 and then multiplying the dummy with the log of the average value of the mean distance of the two countries from all other countries.

$$ln\ btr_{ijt} = a_i + b_j + c_t + \beta1\ ln\ pop_{it} + \beta2\ ln\ pop_{jt} + \beta3\ ln\ dist_{jit} + \beta4\ ln\ ar_{ij} +$$

$$\beta5\ ln\ lang_{ij} + \beta6\ bor_{ij} + \beta7\ lndlck_{ij} + \beta8|ln(\frac{landpc_{it}}{landpc_{jt}})| + \beta6\ rmt_{ij} + \mu_{ijt} \dots\dots (5)$$

Where, dist is the distance between the capitals of the two countries, ar_{ij} is the area of i multiplied by the area of j, lang is a dummy variable which takes a value 1 if the two countries have one common official language, lndlck is a dummy variable which takes a value of 1 if either of the countries is land-locked, bor is a dummy variable which takes a value of 1 if the countries share a border, rmt is the remoteness of the country.

$$rmt_{ij} = 0.5com_{ij}\left\{\left[\ln\left(\sum_{k=1,k\neq j}^{N}\frac{dis_{ik}}{(N-1)}\right)\right] + \left[\ln\left(\sum_{k=1,k\neq i}^{N}\frac{dis_{kj}}{(N-1)}\right)\right]\right\} \ldots\ldots\ldots (6)$$

Com is a common continent dummy variable that takes a value of 0 if both country i and j are located in the same continent, else 1. Dis refers to the distance of countries i and j from all other countries except each other.

The variable trade openness is determined by aggregating the predicted bilateral trade variable.

$$opn_{it} = \sum_{j} exp\left[btr_{ijt}\right] \ldots\ldots\ldots (7)$$

Appendix-2: List of RTAs between 2000 to 2018

RTA Name	Type	Date of entry into force
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	FTA & EIA	30-Dec-18
EU – Armenia	EIA	1-Jun-18
EFTA – Philippines	FTA & EIA	1-Jun-18
China – Georgia	FTA & EIA	1-Jan-18
El Salvador – Ecuador	PSA	16-Nov-17
Hong Kong, China - Macao, China	FTA & EIA	27-Oct-17
Turkey – Singapore	FTA & EIA	1-Oct-17
EU – Canada	FTA & EIA	21-Sep-17
Southern Common Market (MERCOSUR) – Egypt	FTA	1-Sep-17
EFTA – Georgia	FTA & EIA	1-Sep-17
Canada – Ukraine	FTA	1-Aug-17
Peru – Honduras	FTA & EIA	1-Jan-17
EU – Ghana	FTA	15-Dec-16
Turkey - Moldova, Republic of	FTA	1-Nov-16
EU – SADC	FTA	10-Oct-16
Eurasian Economic Union (EAEU) - Viet Nam	FTA & EIA	5-Oct-16
EU - Côte d'Ivoire	FTA	3-Sep-16

Costa Rica – Colombia	FTA & EIA	1-Aug-16
Korea, Republic of – Colombia	FTA & EIA	15-Jul-16
Japan – Mongolia	FTA & EIA	7-Jun-16
Pacific Alliance	FTA & EIA	1-May-16
Southern Common Market (MERCOSUR) - Southern African Customs Union (SACU)	PSA	1-Apr-16
Korea, Republic of - Viet Nam	FTA & EIA	20-Dec-15
China - Korea, Republic of	FTA & EIA	20-Dec-15
Australia – China	FTA & EIA	20-Dec-15
Korea, Republic of - New Zealand	FTA & EIA	20-Dec-15
Chile – Thailand	FTA & EIA	5-Nov-15
Turkey – Malaysia	FTA	1-Aug-15
Mexico – Panama	FTA & EIA	1-Jul-15
Japan – Australia	FTA & EIA	15-Jan-15
Canada - Korea, Republic of	FTA & EIA	1-Jan-15
EFTA - Bosnia and Herzegovina	FTA	1-Jan-15
Eurasian Economic Union (EAEU)	CU & EIA	1-Jan-15
Korea, Republic of – Australia	FTA & EIA	12-Dec-14
Hong Kong, China – Chile	FTA & EIA	9-Oct-14
Canada – Honduras	FTA & EIA	1-Oct-14
EU – Georgia	FTA & EIA	1-Sep-14
EU - Moldova, Republic of	FTA & EIA	1-Sep-14
EFTA - Central America (Costa Rica and Panama)	FTA & EIA	19-Aug-14

EU – Cameroon	FTA	4-Aug-14
Iceland – China	FTA & EIA	1-Jul-14
Switzerland – China	FTA & EIA	1-Jul-14
EU – Ukraine	FTA & EIA	23-Apr-14
Singapore - Chinese Taipei	FTA & EIA	19-Apr-14
Chile - Viet Nam	FTA	1-Jan-14
New Zealand - Chinese Taipei	FTA & EIA	1-Dec-13
Asia Pacific Trade Agreement (APTA)	PSA & EIA	7-Sep-13
Indonesia – Pakistan	PSA	1-Sep-13
Gulf Cooperation Council (GCC) - Singapore	FTA & EIA	1-Sep-13
EU - Central America	FTA & EIA	1-Aug-13
Costa Rica - Singapore	FTA & EIA	1-Jul-13
Costa Rica - Peru	FTA & EIA	1-Jun-13
Turkey - Mauritius	FTA	1-Jun-13
Korea, Republic of - Turkey	FTA	1-May-13
Canada - Panama	FTA & EIA	1-Apr-13
EU - Colombia and Peru	FTA & EIA	1-Mar-13
Malaysia - Australia	FTA & EIA	1-Jan-13
Ukraine - Montenegro	FTA & EIA	1-Jan-13
United States - Panama	FTA & EIA	31-Oct-12
Chile - Nicaragua (Chile - Central America)	FTA & EIA	19-Oct-12
Canada - Jordan	FTA	1-Oct-12
EFTA - Hong Kong, China	FTA & EIA	1-Oct-12

Treaty on a Free Trade Area between members of the Commonwealth of Independent States (CIS)	FTA	20-Sep-12
Mexico - Central America	FTA & EIA	1-Sep-12
EFTA - Montenegro	FTA	1-Sep-12
El Salvador - Cuba	PSA	1-Aug-12
EFTA - Ukraine	FTA & EIA	1-Jun-12
United States - Colombia	FTA & EIA	15-May-12
EU - Eastern and Southern Africa States	FTA	14-May-12
Panama - Peru	FTA & EIA	1-May-12
Korea, Republic of - United States	FTA & EIA	15-Mar-12
Japan - Peru	FTA & EIA	1-Mar-12
Chile - Malaysia	FTA	25-Feb-12
Peru - Mexico	FTA & EIA	1-Feb-12
Canada - Colombia	FTA & EIA	15-Aug-11
China - Costa Rica	FTA & EIA	1-Aug-11
India - Japan	FTA & EIA	1-Aug-11
Peru - Korea, Republic of	FTA & EIA	1-Aug-11
EFTA - Colombia	FTA & EIA	1-Jul-11
India - Malaysia	FTA & EIA	1-Jul-11
EU - Korea, Republic of	FTA & EIA	1-Jul-11
EFTA - Peru	FTA	1-Jul-11
Turkey - Chile	FTA	1-Mar-11
Hong Kong, China - New Zealand	FTA & EIA	1-Jan-11
EFTA - Albania	FTA	1-Nov-10

EFTA - Serbia	FTA	1-Oct-10
Turkey - Serbia	FTA & EIA	1-Sep-10
New Zealand - Malaysia	FTA & EIA	1-Aug-10
East African Community (EAC)	CU & EIA	1-Jul-10
Mexico - Bolivia, Plurinational State of	PSA	7-Jun-10
ASEAN Free Trade Area (AFTA)	FTA	17-May-10
Chile - Guatemala (Chile - Central America)	FTA & EIA	23-Mar-10
Turkey - Montenegro	FTA	1-Mar-10
Peru - China	FTA & EIA	1-Mar-10
EU - Serbia	FTA & EIA	1-Feb-10
ASEAN - Korea, Republic of	FTA & EIA	1-Jan-10
ASEAN - India	FTA & EIA	1-Jan-10
Korea, Republic of - India	FTA & EIA	1-Jan-10
ASEAN - Australia - New Zealand	FTA & EIA	1-Jan-10
Southern Common Market (MERCOSUR) - Israel	FTA	23-Dec-09
EU - Pacific States	FTA	20-Dec-09
Panama - Nicaragua (Panama - Central America)	FTA & EIA	21-Nov-09
Colombia - Northern Triangle (El Salvador, Guatemala, Honduras)	FTA & EIA	12-Nov-09
India - Nepal	PSA	27-Oct-09
Japan - Viet Nam	FTA & EIA	1-Oct-09
Japan - Switzerland	FTA & EIA	1-Sep-09
Canada - Peru	FTA & EIA	1-Aug-09

Peru - Singapore	FTA & EIA	1-Aug-09
EFTA - Canada	FTA	1-Jul-09
Panama - Guatemala (Panama - Central America)	FTA & EIA	20-Jun-09
Southern Common Market (MERCOSUR) - India	PSA	1-Jun-09
Chile - Colombia	FTA & EIA	8-May-09
Australia - Chile	FTA & EIA	6-Mar-09
Peru - Chile	FTA & EIA	1-Mar-09
United States - Peru	FTA & EIA	1-Feb-09
Panama - Honduras (Panama - Central America)	FTA & EIA	9-Jan-09
China - Singapore	FTA & EIA	1-Jan-09
United States - Oman	FTA & EIA	1-Jan-09
EU - CARIFORUM States	FTA & EIA	29-Dec-08
Japan - Philippines	FTA & EIA	11-Dec-08
ASEAN - Japan	FTA	1-Dec-08
Panama - Costa Rica (Panama - Central America)	FTA & EIA	23-Nov-08
Turkey - Georgia	FTA	1-Nov-08
China - New Zealand	FTA & EIA	1-Oct-08
Brunei Darussalam - Japan	FTA & EIA	31-Jul-08
Chile - Honduras (Chile - Central America)	FTA & EIA	19-Jul-08
EU - Bosnia and Herzegovina	FTA & EIA	1-Jul-08
Japan - Indonesia	FTA & EIA	1-Jul-08
EFTA - SACU	FTA	1-May-08
Turkey - Albania	FTA	1-May-08

Panama - Chile	FTA & EIA	7-Mar-08
El Salvador- Honduras - Chinese Taipei	FTA & EIA	1-Mar-08
EU - Montenegro	FTA & EIA	1-Jan-08
Nicaragua - Chinese Taipei	FTA & EIA	1-Jan-08
Pakistan - Malaysia	FTA & EIA	1-Jan-08
Mauritius - Pakistan	PSA	30-Nov-07
Japan - Thailand	FTA & EIA	1-Nov-07
Chile - Japan	FTA & EIA	3-Sep-07
Chile - India	PSA	17-Aug-07
EFTA - Egypt	FTA	1-Aug-07
Pakistan - China	FTA & EIA	1-Jul-07
Central European Free Trade Agreement (CEFTA) 2006	FTA	1-May-07
Agadir Agreement	FTA	27-Mar-07
Egypt - Turkey	FTA	1-Mar-07
Turkey - Syria	FTA	1-Jan-07
EFTA - Lebanon	FTA	1-Jan-07
EU - Albania	FTA & EIA	1-Dec-06
Ukraine - Belarus	FTA	11-Nov-06
Iceland - Faroe Islands	FTA & EIA	1-Nov-06
Chile - China	FTA & EIA	1-Oct-06
EFTA - Korea, Republic of	FTA & EIA	1-Sep-06
United States - Bahrain	FTA & EIA	1-Aug-06
India - Bhutan	PSA	29-Jul-06

Panama - Singapore	FTA & EIA	24-Jul-06
Japan - Malaysia	FTA & EIA	13-Jul-06
Guatemala - Chinese Taipei	FTA & EIA	1-Jul-06
Russian Federation - Serbia	FTA	3-Jun-06
Trans-Pacific Strategic Economic Partnership	FTA & EIA	28-May-06
Korea, Republic of - Singapore	FTA & EIA	2-Mar-06
Dominican Republic - Central America - United States Free Trade Agreement (CAFTA-DR)	FTA & EIA	1-Mar-06
South Asian Free Trade Agreement (SAFTA)	FTA	1-Jan-06
Turkey - Morocco	FTA	1-Jan-06
United States - Morocco	FTA & EIA	1-Jan-06
Southern Common Market (MERCOSUR)	CU & EIA	7-Dec-05
EU - Algeria	FTA	1-Sep-05
Jordan - Singapore	FTA & EIA	22-Aug-05
India - Singapore	FTA & EIA	1-Aug-05
Thailand - New Zealand	FTA & EIA	1-Jul-05
Turkey - Tunisia	FTA	1-Jul-05
Pakistan - Sri Lanka	FTA	12-Jun-05
Turkey - Palestine	FTA	1-Jun-05
EFTA - Tunisia	FTA	1-Jun-05
Ukraine - Moldova, Republic of	FTA	19-May-05
Japan - Mexico	FTA & EIA	1-Apr-05
ASEAN - China	FTA & EIA	1-Jan-05
Thailand - Australia	FTA & EIA	1-Jan-05

United States - Australia	FTA & EIA	1-Jan-05
EFTA - Chile	FTA & EIA	1-Dec-04
India - Thailand	PSA	1-Sep-04
Mexico - Uruguay	FTA & EIA	15-Jul-04
Southern African Customs Union (SACU)	CU	15-Jul-04
EU - Egypt	FTA	1-Jun-04
Common Economic Zone (CEZ)	FTA	20-May-04
Korea, Republic of - Chile	FTA & EIA	1-Apr-04
Panama - Chinese Taipei	FTA & EIA	1-Jan-04
United States - Singapore	FTA & EIA	1-Jan-04
United States - Chile	FTA & EIA	1-Jan-04
GUAM	FTA & EIA	10-Dec-03
China - Macao, China	FTA & EIA	17-Oct-03
Singapore - Australia	FTA & EIA	28-Jul-03
Morocco - United Arab Emirates	FTA	9-Jul-03
Turkey - Bosnia and Herzegovina	FTA	1-Jul-03
China - Hong Kong, China	FTA & EIA	29-Jun-03
India - Afghanistan	PSA	13-May-03
Brazil - Mexico	PSA	2-May-03
Pacific Island Countries Trade Agreement (PICTA)	FTA	13-Apr-03
Panama - El Salvador (Panama - Central America)	FTA & EIA	11-Apr-03
EU - Lebanon	FTA	1-Mar-03

EU - Chile	FTA & EIA	1-Feb-03
Gulf Cooperation Council (GCC)	CU	1-Jan-03
EFTA - Singapore	FTA & EIA	1-Jan-03
Japan - Singapore	FTA & EIA	30-Nov-02
Canada - Costa Rica	FTA	1-Nov-02
EFTA - Jordan	FTA	1-Sep-02
Ukraine - Tajikistan	FTA	11-Jul-02
Caribbean Community and Common Market (CARICOM)	CU & EIA	4-Jul-02
European Free Trade Association (EFTA)	FTA & EIA	1-Jun-02
Chile - El Salvador (Chile - Central America)	FTA & EIA	1-Jun-02
EU - Jordan	FTA	1-May-02
EFTA - North Macedonia	FTA	1-May-02
EU - San Marino	CU	1-Apr-02
Chile - Costa Rica (Chile - Central America)	FTA & EIA	15-Feb-02
Armenia - Kazakhstan	FTA	25-Dec-01
United States - Jordan	FTA & EIA	17-Dec-01
Dominican Republic - Central America	FTA & EIA	4-Oct-01
Ukraine - North Macedonia	FTA	5-Jul-01
EFTA - Mexico	FTA & EIA	1-Jul-01
EU - North Macedonia	FTA & EIA	1-Jun-01
Mexico - Cuba	PSA	28-Feb-01
New Zealand - Singapore	FTA & EIA	1-Jan-01

Southern African Development Community (SADC)	FTA	1-Sep-00
Turkey - North Macedonia	FTA	1-Sep-00
EU - Mexico	FTA & EIA	1-Jul-00
Israel - Mexico	FTA	1-Jul-00
EU - Israel	FTA	1-Jun-00
India - Sri Lanka	FTA	1-Mar-00
EU - Morocco	FTA	1-Mar-00
Georgia - Turkmenistan	FTA	1-Jan-00
EU - South Africa	FTA	1-Jan-00
West African Economic and Monetary Union (WAEMU)	CU	1-Jan-00

Source: WTO RTAIS database

Appendix-3: List of all the countries

High Income	Middle income		Low income	
USA	Mexico	Tunisia	Nicaragua	Pakistan
Canada	Panama	Egypt	Haiti	India
Greenland	Costa Rica	Jordan	Lesotho	Nepal
Iceland	Venezuela	Iraq	Madagascar	Bangladesh
France	Brazil	Iran	Mozambique	Bhutan
Finland	Chile	Turkmenistan	Zimbabwe	Myanmar
Sweden	Argentina	Kazakhstan	Zambia	Indonesia
Norway	Uruguay	Belarus	Angola	Mongolia
United Kingdom	South Africa	Latvia	Dominican Republic of Congo	Vietnam
Ireland	Gabon	Lithuania	Tanzania	Cambodia
Germany	Botswana	Bosnia and Herzegovina	Rwanda	Solomon islands
Netherlands	Oman	Albania	Uganda	Côte d'Ivoire
Denmark	Saudi Arabia	Romania	Kenya	Samoa
Belgium	Libya	Sri Lanka	Ethiopia	Moldova
Switzerland	Turkey	Papua New Guinea	Kenya	Malawi
Italy	Croatia	Philippines	Eritrea	
Austria	Hungary	China	Sudan	
Greece	Poland	Thailand	South Sudan	

Spain	Slovakia	Jamaica	Central African Republic	
Portugal	Czech Republic	Mauritius	Chad	
Israel	Lebanon	Bulgaria	Cameroon	
Cyprus	Estonia	Cape Verde	Nigeria	
United Arab Emirates	Malaysia	Argentina	Niger	
Qatar	Republic of Korea	Fiji	Benin	
Kuwait	Serbia	Trinidad and Tobago	Togo	
Japan	Kosovo	Dominica	Ghana	
Australia	Montenegro	Saint Vincent and the Grenadines	Liberia	
New Zealand	Guatemala	Vanuatu	Sierra Leone	
Hong kong	Belize	Tonga	Guinea	
Austria	El Salvador	Tuvalu	Senegal	
Brunei Darussalam	Honduras		Mauritania	
Luxembourg	Cuba		Mali	
Malta	Dominican Republic		Yemen	
Slovak Republic	Colombia		Azerbaijan	

Slovenia	Ecuador		Armenia	
Singapore	Peru		Ukraine	
Seychelles	Bolivia		Uzbekistan	
Bahamas	Russia		Kyrgyz republic	
Bahamas	Paraguay		Tajikistan	
Antigua and Barbuda	Guyana		Afghanistan	

Source: World Bank (Year 2000 classification)

Appendix-4: Long run convergence of environmental factors with RTAs and inclusion of environmental provisions

VARIABLES	(1) Fossil fuel	(2) Tree cover loss	(3) Marine protected areas	(4) Terrestrial protected areas
RTA_t	0.0263***	0.0547***	0.0690***	-0.0005
	(0.0075)	(0.0202)	(0.0243)	(0.0137)
EP_t	0.0110	0.7679***	-0.0234	0.0602***
	(0.0089)	(0.0241)	(0.0291)	(0.0164)
RTA_{t-1}	-0.0186**	-0.6536***	0.0042	-0.0809***
	(0.0090)	(0.0243)	(0.0292)	(0.0165)
EP_{t-1}	0.0063	-0.3938***	0.0023	0.0705***
	(0.0090)	(0.0243)	(0.0292)	(0.0165)
RTA_{t-2}	-0.0335***	0.3084***	-0.0638**	-0.1046***
	(0.0083)	(0.0225)	(0.0271)	(0.0153)
EP_{t-2}	0.0216***	-0.2294***	-0.0765***	0.0571***
	(0.0072)	(0.0195)	(0.0234)	(0.0132)
$RTA_{t-1} - RTA_t$	-	-	-	-
$EP_{t-1} - EP_t$	-	-	-	-
$RTA_{t-2} - RTA_{t-1}$	-	-	-	-
$EP_{t-2} - EP_{t-1}$	-	-	-	-
Abs ln land per capita ratio	0.2040***	0.2770***	-0.0240	0.0403***
	(0.0045)	(0.0122)	(0.0147)	(0.0083)
Abs ln population ratio	-0.0502***	-0.0162	-0.0553***	0.0487***

	(0.0049)	(0.0132)	(0.0159)	(0.0090)
Abs ln rate of urbanization ratio	0.0073***	0.0187***	0.0123***	0.0199***
	(0.0008)	(0.0022)	(0.0027)	(0.0015)
Abs ln openness predicted ratio	-0.1869***	0.2423***	1.0245***	0.5765***
	(0.0156)	(0.0422)	(0.0508)	(0.0287)
Abs ln GDP per capita predicted	0.1277***	-0.1631***	-0.0509***	-0.0033
	(0.0027)	(0.0074)	(0.0089)	(0.0050)
Abs ln bilateral trade predicted	0.2319***	0.0354**	-0.4137***	0.4651***
	(0.0054)	(0.0145)	(0.0175)	(0.0099)
Time dummy	-0.0141***	-0.0182***	-0.0259***	-0.0273***
	(0.0002)	(0.0004)	(0.0005)	(0.0003)
Constant	-2.2213***	0.3057*	5.1748***	-4.3968***
	(0.0586)	(0.1583)	(0.1906)	(0.1077)
Observations	413,029	413,029	413,029	413,029
R-squared	0.1462	0.0251	0.0124	0.1459
Number of country pairs	26,171	26,171	26,171	26,171

Standard errors in parentheses

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

Appendix-5: Long run convergence of occupational hazards with RTAs and inclusion of labour provisions

VARIABLES	(1) Exposure to occu. PM/gases/fumes	(2) Exposure to occu. noise	(3) Exposure to occu. carcinogen
RTA_t	-0.0147***	0.0035	-0.0175***
	(0.0030)	(0.0030)	(0.0028)
LP_t	0.0366***	0.0204***	0.0393***
	(0.0039)	(0.0039)	(0.0037)
RTA_{t-1}	-0.0014	-0.0107**	-0.0012
	(0.0030)	(0.0042)	(0.0029)
LP_{t-1}	-0.0006	0.0023	-0.0001
	(0.0041)	(0.0056)	(0.0039)
RTA_{t-2}	0.0043*	0.0001	0.0066***
	(0.0023)	(0.0036)	(0.0022)
LP_{t-2}	-0.0048	0.0110**	-0.0050*
	(0.0032)	(0.0050)	(0.0030)
$RTA_{t-1} - RTA_t$	-	-	-
$LP_{t-1} - LP_t$	-	-	-
$RTA_{t-2} - RTA_{t-1}$	-	-	-
$LP_{t-2} - LP_{t-1}$	-	-	-
Abs ln land per capita ratio	0.0147***	0.0068***	-0.0016

	(0.0023)	(0.0019)	(0.0022)
Abs ln population ratio	0.0002	0.0109***	-0.0037
	(0.0024)	(0.0018)	(0.0023)
Abs ln rate of urbanization ratio	-0.0001	0.0001	-0.0005*
	(0.0003)	(0.0003)	(0.0003)
Abs ln openness predicted ratio	0.0201**	0.0009	-0.0261***
	(0.0079)	(0.0006)	(0.0075)
Abs ln GDP per capita predicted	0.8711***	0.8767***	0.9034***
	(0.0013)	(0.0013)	(0.0012)
Abs ln bilateral trade predicted	0.0252***	-0.0002	0.0030
	(0.0028)	(0.0003)	(0.0026)
Time dummy	-0.0027***	-0.0028***	-0.0029***
	(0.0001)	(0.0000)	(0.0001)
Constant	-0.4536***	-0.1941***	-0.2247***
	(0.0292)	(0.0058)	(0.0277)
Observations	248,316	228,830	245,724
R-squared	0.7100	0.7286	0.7420
Number of country pairs	21,756	22,144	21,452

Standard errors in parentheses

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