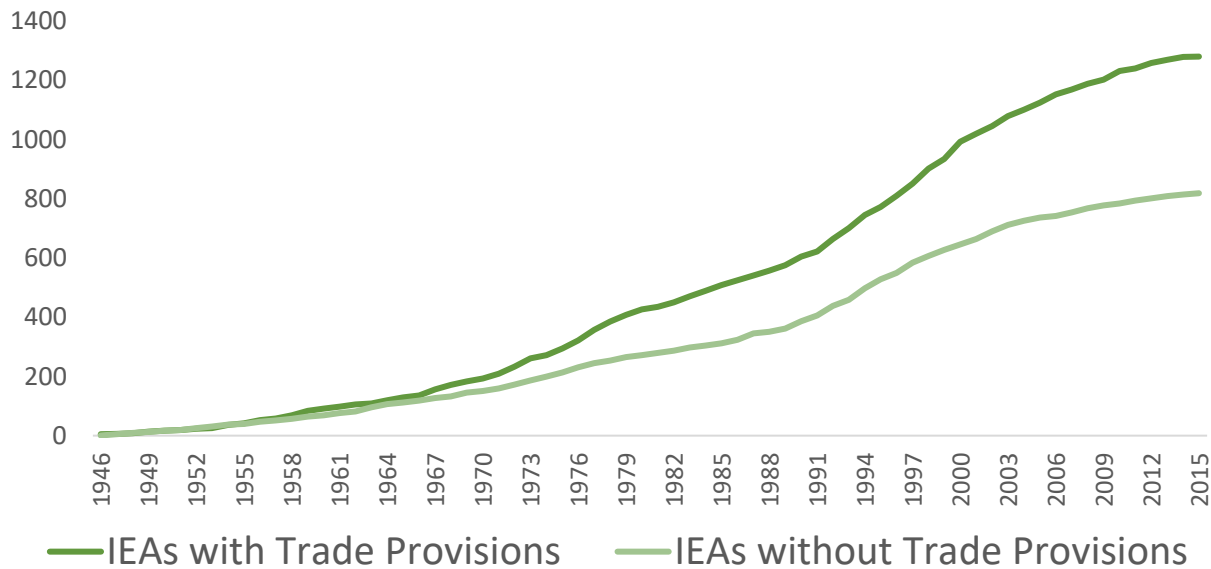


Trade Effects of Environmental Agreements: Uncovering *De Facto* Environmental Clubs (Morin, Brandi, Schwab)

Question: Does including trade provisions in IEAs generate “Environmental Clubs” by increasing trade between member countries relative to non members?

Data: Novel database on Trade- and Investment-related Provisions in IEAs (TIPEA)

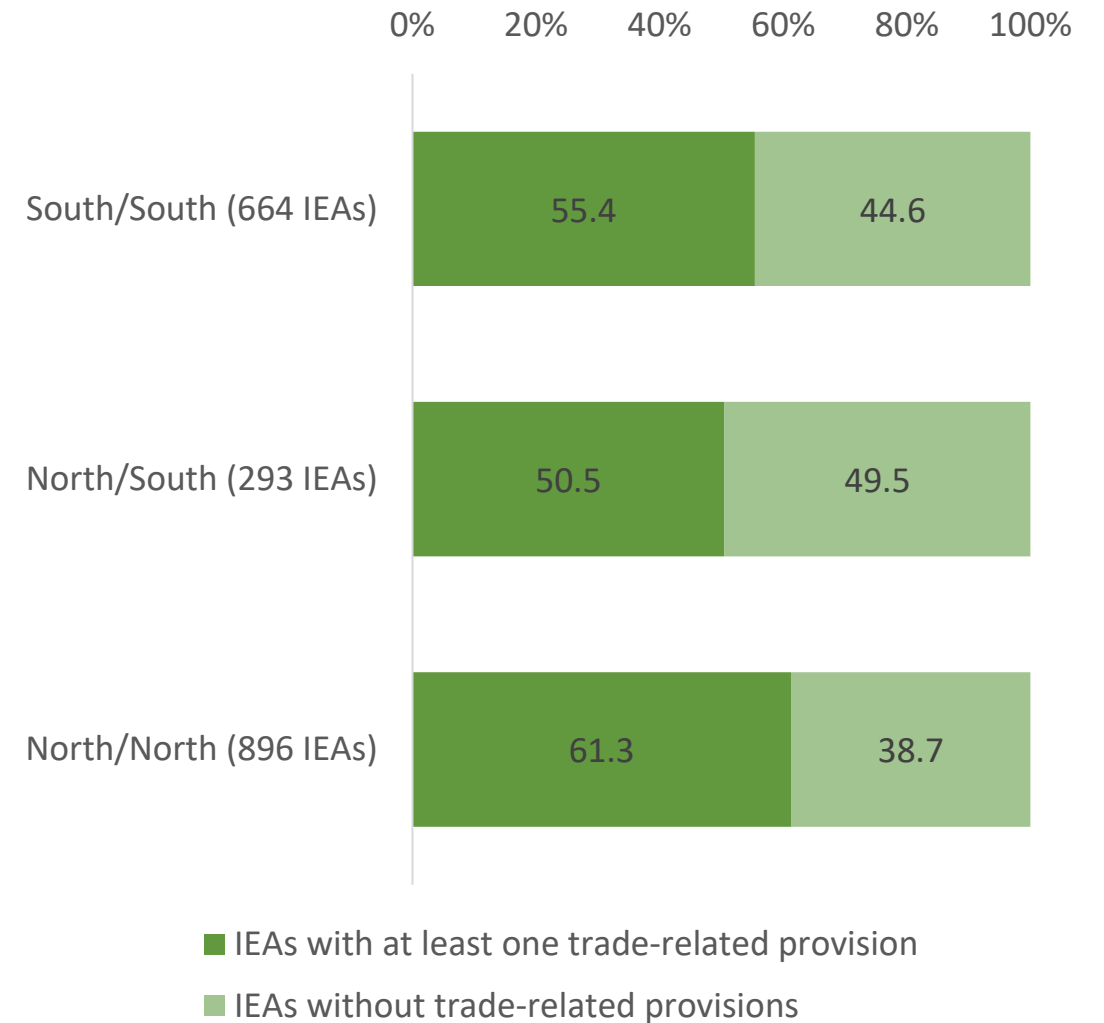
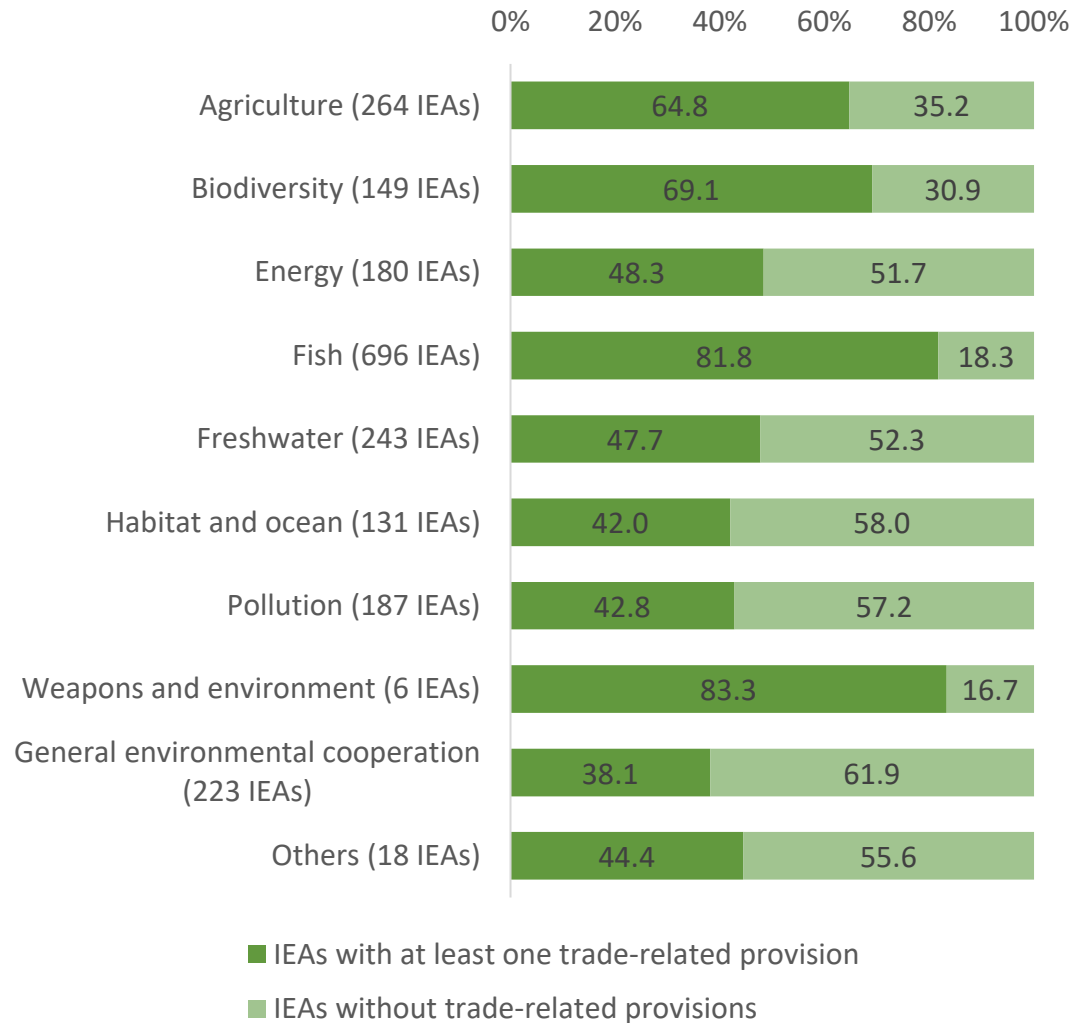


Analytical Framework: Gravity estimation of trade flows in the panel (1984-2017, ≈130 countries, 2,097 IEAs)

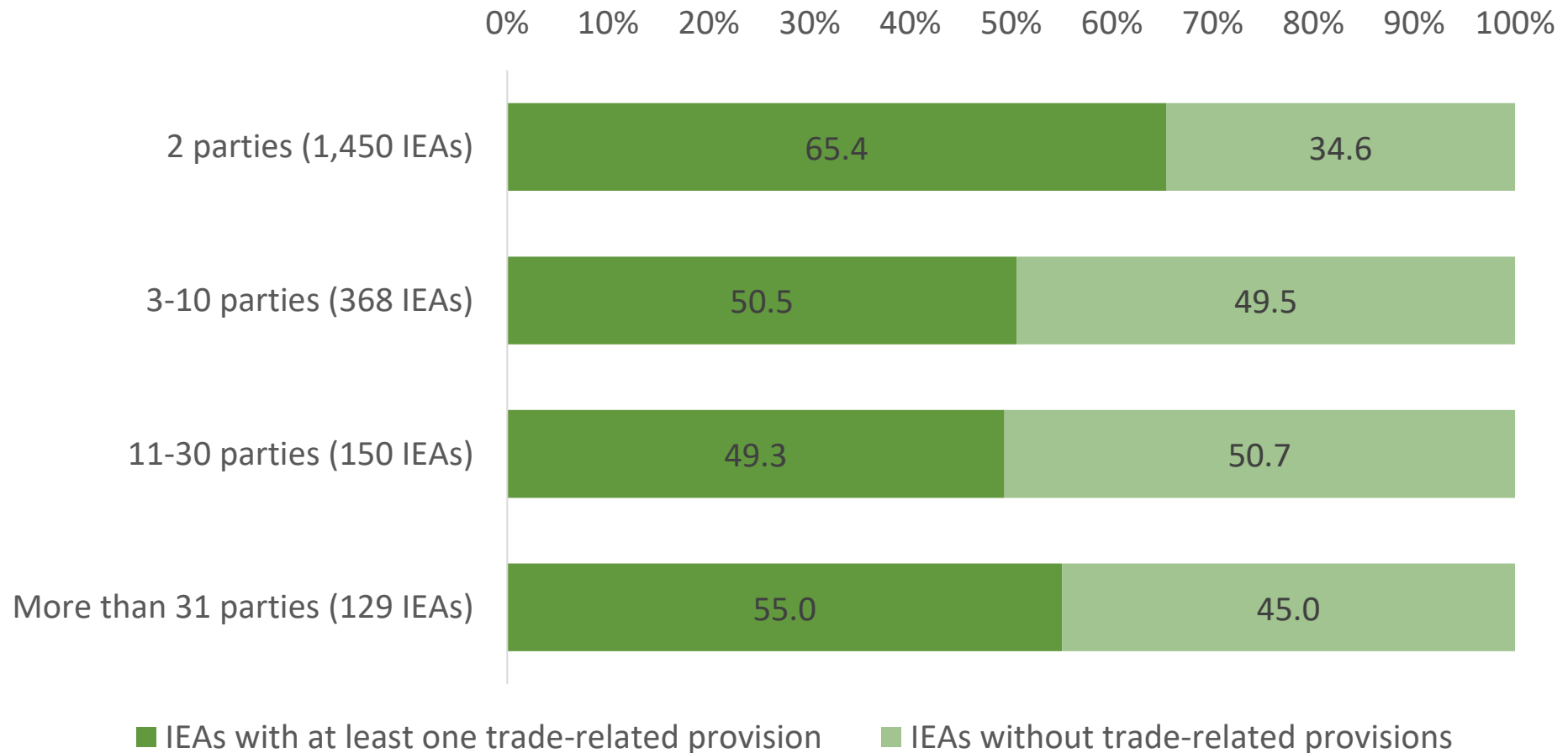


RESULT: Trade-liberalizing IEAs increase trade flows between their parties (relative to non-members)

IEAs with trade provisions by issue area and country type



IEAs with trade provisions by number of parties



Liberal Index

Dimension 1.1: Liberal principles

	Weight	Nb of IEAs
General commitment towards liberalized trade	1	120
Environmental measures should not hamper trade	1	19
Sum of the indicators. Score of this dimension between 0 and 2.		

Dimension 1.2: Non-discrimination in trade

	Weight	Nb of IEAs
Most-favored-nation treatment	3	15
National treatment	3	22
Other references to non-discrimination in trade	1	105
Sum of the indicators. Score of this dimension between 0 and 7.		

Dimension 1.3: Non-limitation of trade

	Weight	Nb of IEAs
Non-prohibition or non-limitation of importations	3	127
Non-prohibition or non-limitation of exportations	3	69
Sum of the indicators. Score of this dimension between 0 and 6.		

Dimension 1.4: Promotion of trade

	Weight	Nb of IEAs
Ecotourism	1	24
Trade in environmental goods or services	1	20
Promotion of ecolabel or certifications	1	24
Emissions trading schemes	1	12
Sum of the indicators. Score of this dimension between 0 and 4.		

Dimension 1.6: Acknowledgment of international trade commitments

	Weight	Nb of IEAs
Cooperation with GATT-WTO	2	1
Reference to GATT-WTO	1	31
Cooperation with another trade institution	2	18
Reference to another trade institution	1	378
Maximum of the indicators. Score of this dimension between 0 and 2.		

Dimension 1.5: Promotion of a liberal market economy

	Weight	Nb of IEAs
Open access to natural resources	2	323
Liberalize foreign investment	2	43
Restrict subsidies	2	4
Restrict monopolistic practices	2	4
Liberalize public procurement	2	9
Sum of the indicators. Score of this dimension between 0 and 10.		

Restrictive Index

Dimension 2.1: Import restrictions

	Weight	Nb of IEAs
Prohibition on import without a permit	3	14
Other import prohibition	3	67
Importer can require information	3	54
Importer can require quarantine	2	49
Other import restriction of general application	3	137
Ad hoc refusal of importations	2	38
Non-tariff duties or import taxes	3	7
Maximum of the indicators. Score of this dimension between 0 and 3.		

Dimension 2.2: Export restrictions

	Weight	Nb of IEAs
Prohibition to export without a permit	3	26
Other export prohibitions	3	40
Exporter must notify the importer	2	17
Information requirement for exporter	2	121
Other export restrictions of general application	3	123
Ad hoc refusal of exportations	2	20
Export taxes	3	4
Maximum of the indicators. Score of this dimension between 0 and 3.		

Dimension 2.3: Trade with non-members

	Weight	Nb of IEAs
Regulation of imports from non-parties	4	23
Regulation of exports to non-parties	4	32
Sum of the indicators. Score of this dimension between 0 and 8.		

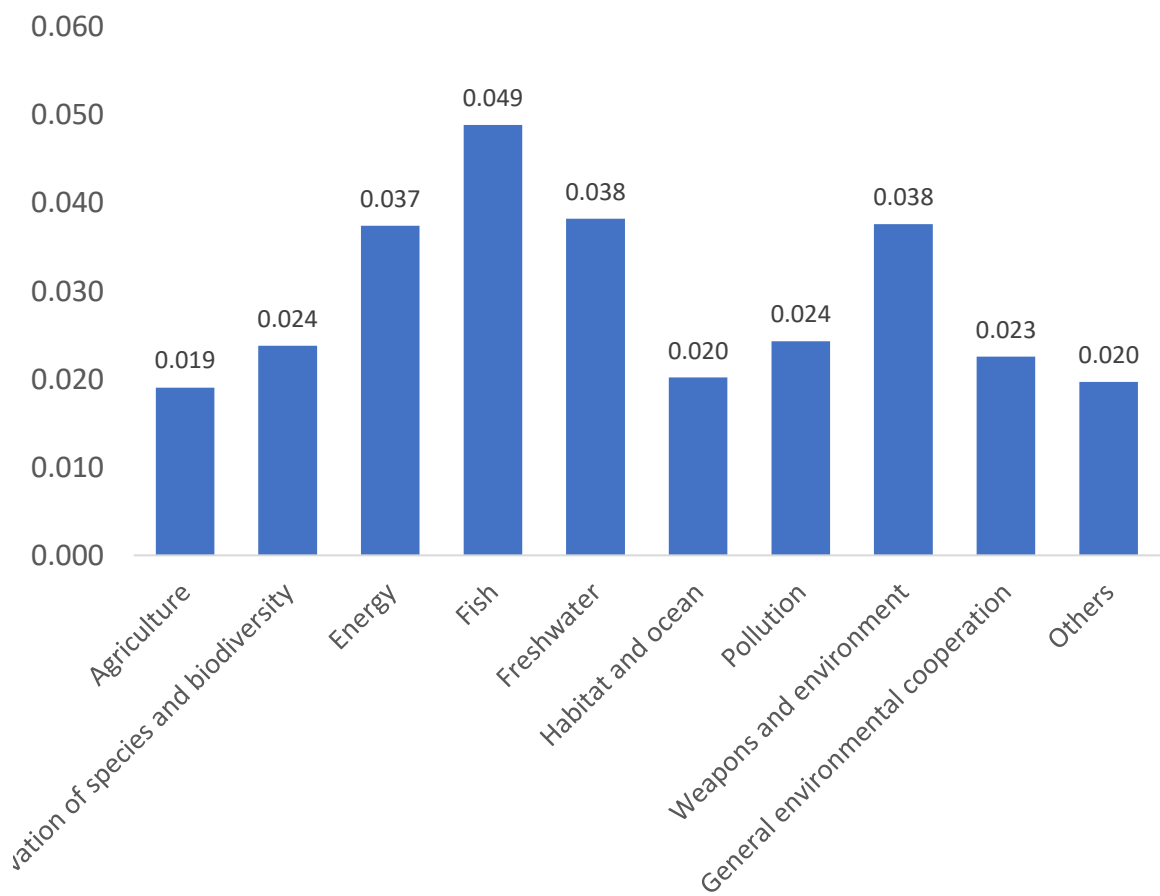
Dimension 2.4: Restriction on economic activities

	Weight	Nb of IEAs
Restrictions on the production of specific goods	2	26
Restrictions on the extraction of specific natural resources	2	618
Restrictions on the selling of specific goods	2	72
Restrictions on the consumption of specific goods	2	226
Restrictions on the transportation of specific products	2	19
Restrictions on construction activities	1	25
Sum of the indicators. Score of this dimension between 0 and 11.		

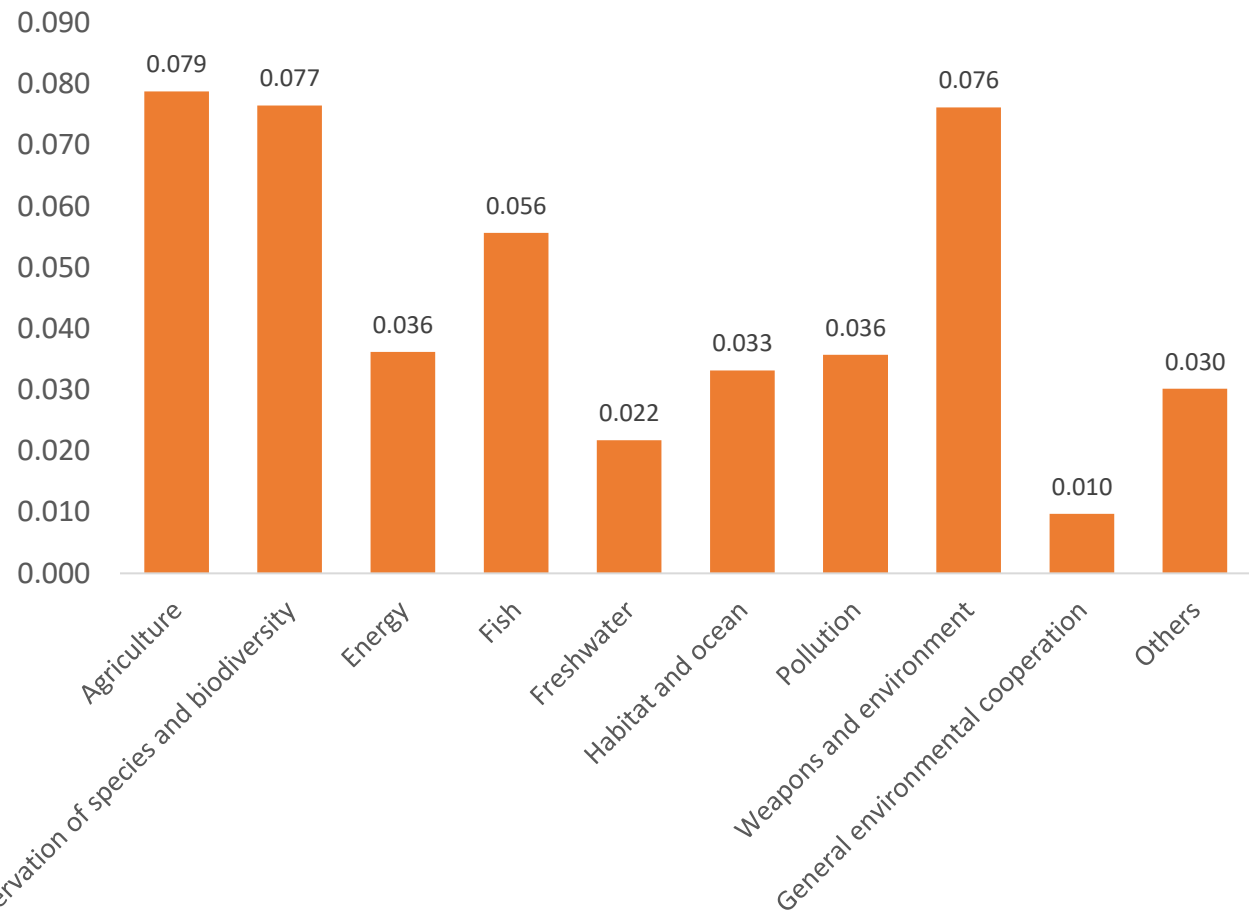
Dimension 2.5: Restrictions on a liberal market economy

	Weight	Nb of IEAs
Access to natural resources is restricted	2	30
Foreign investment is restricted	2	3
Monopolistic practices are authorized	2	1
Public procurement is protected	2	0
Subsidies are authorized	2	1
Sum of the indicators. Score of this dimension between 0 and 10.		

Liberal and restrictive provisions by sector



■ Liberal



■ Restrictive

Summary Statistics

IEA LEVEL OBSERVATIONS

Variable	Obs	Mean	Std. Dev.	Min	Max
No. of Partners	2,097	9.19	25.33117	2	199
Liberalizing Index	2,097	0.0340733	0.0584494	0	0.7096774
Restrictive Index	2,097	0.0462293	0.0692161	0	0.6285715
Number of Words	2,097	3174.78	4087.296	0	81555

TRADE FLOW LEVEL OBSERVATIONS

Variable	Obs	Mean	Std. Dev.	Min	Max
EXPORTS	712,006	7.601841	3.868097	0.0009995	20.29332
Liberalizing Index	712,006	0.2016312	0.1509947	0	0.7096774
Restrictive Index	712,006	0.3231143	0.1852371	0	0.6285715
IEA	712,006	0.8903155	0.3124963	0	1
Complexity	712,006	0	0.9435652	-1.507808	1.247983
PTA	712,006	0.146128	0.3532347	0	1

PEARSON CORRELATIONS

	Liberalizing index	Restrictive index	IEA	Complexity	PTA
Liberalizing Index	1				
Restrictive Index	0.6443	1			
IEA	0.4687	0.6123	1		
Complexity	0.5487	0.3343	0	1	
PTA	0.1454	0.1267	0.1065	0.0868	1

Baseline Regression

$$EXPORTS_{eit} = \beta * TRIndex_{eit} + \gamma * IEA_{eit} + \delta * Complexity_{eit} + \lambda * PTA_{eit} + \alpha_{ei} + \alpha_{et} + \alpha_{it} + \varepsilon_{eit}$$

Baseline Regression

	EXPORTS
Liberalizing Index	0.418*** (0.072)
Restrictive Index	-0.040 (0.056)
IEA	-0.122** (0.060)
Complexity	-0.040*** (0.014)
PTA	0.136*** (0.027)
Exporter-Importer Fixed Effects	Yes
Exporter- and Importer-Year Fixed Effects	Yes
Observations	712,006
R²	0.882

Complement with PTA

EXPORTS	
Liberalizing Index	0.721***
X PTA	(0.110)
Liberalizing Index	0.328***
X NO_PTA	(0.077)
Restrictive Index	-0.144
X PTA	(0.109)
Restrictive Index	-0.014
X NO_PTA	(0.058)
IEA	0.016
X PTA	(0.123)
IEA	-0.126**
X NO_PTA	(0.061)
Complexity	-0.071***
X PTA	(0.022)
Complexity	-0.032**
X NO_PTA	(0.014)
PTA	-0.048
	(0.112)

PPML Regressions

	(1)	(2)	(3)
	EXPORTS	EXPORTS	EXPORTS
Liberalizing Index	0.137*	0.148*	
	(0.079)	(0.079)	
Restrictive Index	0.074		0.097
	(0.112)		(0.111)
IEA	0.198	0.201	0.203
	(0.127)	(0.130)	(0.127)
Complexity	-0.099***	-0.098***	-0.092***
	(0.021)	(0.021)	(0.019)
PTA	-0.041	-0.042	-0.041
	(0.054)	(0.055)	(0.054)
Exporter-Importer Fixed Effects	Yes	Yes	Yes
Exporter- and Importer-Year Fixed Effects	Yes	Yes	Yes
Observations	1095017	1095017	1095017
R²	0.989	0.989	0.989

Subindices

	(1)	(2)		(1)	(2)
	EXPORTS	EXPORTS		EXPORTS	EXPORTS
1.1: Liberal Principles	0.004 (0.014)	-0.009 (0.014)	2.4: Restriction on economic activities	0.007 (0.005)	0.003 (0.005)
1.2: Non-discrimination in trade	0.010** (0.005)	0.001 (0.005)	2.5: Restrictions on a liberal market economy	0.027*** (0.008)	0.002 (0.009)
1.3: Non-limitation of trade	0.004 (0.004)	0.003 (0.004)	IEA	-0.098 to -0.084 (0.060)	-0.093 (0.060)
1.4: Promotion of trade	0.033*** (0.010)	0.012 (0.011)	Complexity	-0.025 to -0.015 (0.013) to (0.014)	-0.021 (0.014)
1.5: Promotion of a liberal market economy	0.042*** (0.005)	0.038*** (0.007)	PTA	0.134*** to 0.140*** (0.027)	0.134*** (0.027)
1.6: Acknowledgment of intern. trade comm.	0.041** (0.016)	0.002 (0.017)	Constant	7.597*** to 7.663*** (0.054) to (0.058)	7.583*** (0.058)
2.1: Import restrictions	-0.003 (0.006)	-0.002 (0.008)	Exporter-Importer Fixed Effects	Yes	Yes
			Exporter- and Importer-Year Fixed Effects	Yes	Yes
2.2: Export restrictions	-0.001 (0.006)	-0.004 (0.009)	Observations	712006	712006
			R ²	0.881 to 0.882	0.882
2.3: Trade with non-members	0.004* (0.002)	0.002 (0.002)			

	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
	EXPORTS	EXPORTS		EXPORTS	EXPORTS		EXPORTS	EXPORTS		EXPORTS	EXPORTS
Gen. commit. to liberal. of trade	-0.007 (0.017)	-0.026 (0.018)	Restrict subsidies	0.046** (0.018)	0.097* (0.052)	Non-tariff duties or import taxes	-0.069 (0.048)	-0.232 (0.175)	Restrictions on the cons. of specific goods	0.052*** (0.016)	0.054*** (0.019)
Envir. measures should not hamper trade	0.007 (0.019)	0.008 (0.021)	Restrict monopolistic practices	0.417*** (0.041)	1.838*** (0.313)	Prohibition to export without a permit	0.012 (0.019)	-0.030 (0.030)	Restrictions on the transportation of specific products	0.031** (0.016)	0.033* (0.018)
MFN treatment	0.339*** (0.042)	-0.050 (0.076)	Liberalize public procurement	0.412*** (0.041)	-0.300 (0.284)	Other export prohibitions	0.014 (0.016)	0.031 (0.030)	Restrictions on construction activities	0.090*** (0.029)	-0.187*** (0.066)
National treatment	-0.004 (0.019)	-0.005 (0.022)	Cooperation with GATT-WTO	-0.091** (0.038)	-0.096** (0.039)	Exporter must notify the importer	0.024 (0.015)	0.026 (0.020)	Access to natural resources is restricted	0.002 (0.019)	0.020 (0.025)
Other references to non-discr. in trade	-0.001 (0.018)	-0.002 (0.020)	Reference to GATT-WTO	0.026 (0.023)	-0.064** (0.031)	Information requirement for exp.	0.010 (0.017)	0.081* (0.042)	Foreign investment is restricted	0.414*** (0.041)	-1.202*** (0.123)
Non-limitation of import.	0.014 (0.022)	0.119** (0.049)	Cooperation with another trade institution	0.301*** (0.030)	0.207*** (0.037)	Other export restrictions of gen. application	0.008 (0.017)	-0.033 (0.028)	Monopolistic practices are authorized	0.029 (0.028)	0.015 (0.029)
Non-limitation of export.	0.027 (0.022)	-0.122*** (0.047)	Ref. to another trade institution	-0.036* (0.020)	-0.048** (0.021)	Ad hoc refusal of exportations	-0.018 (0.022)	-0.019 (0.026)	Public procurement is protected	/	/
Ecotourism	0.112*** (0.027)	0.257*** (0.060)	Prohibition to import without a permit	0.063** (0.028)	0.092** (0.040)	Export taxes	-0.068 (0.048)	0.134 (0.182)	Subsidies are authorized	0.417*** (0.041)	0.000 (.)
Trade in envir. goods or services	0.062*** (0.020)	-0.005 (0.026)	Other import prohibition	-0.002 (0.017)	-0.024 (0.028)	Regulation of imp. from non-parties	0.034* (0.018)	0.057 (0.041)	IEA	-0.105 to -0.054 (0.060)	-0.052 (0.064)
Promotion of ecolabel or certifications	0.071*** (0.017)	0.032* (0.019)	Importer can require information	0.004 (0.016)	-0.088** (0.043)	Regulation of exports to non-parties	0.025 (0.017)	-0.036 (0.040)	Complexity	-0.030 to 0.010 (0.013) to (0.021)	0.007 (0.022)
Emissions trading schemes	0.039** (0.019)	-0.063 (0.054)	Importer can require quarantine	-0.003 (0.022)	0.032 (0.027)	Restrictions on the production of specific goods	-0.008 (0.017)	-0.025 (0.019)	PTA	0.127*** to 0.141*** (0.027)	0.119*** (0.027)
Open access to natural resources	0.004 (0.018)	-0.046* (0.025)	Other import restriction of general application	0.003 (0.017)	0.017 (0.024)	Restrictions on the extraction of specific natural resources	0.061*** (0.016)	0.061*** (0.017)	Constant	7.615*** to 7.682*** (0.053) to (0.055)	7.604*** (0.061)
Liberal. of foreign investment	0.076*** (0.022)	0.038* (0.023)	Ad hoc refusal of importations	0.008 (0.019)	0.003 (0.024)	Restrictions on the selling of specific goods	0.022 (0.022)	-0.029 (0.024)	Observations	712006	712006
									R ²	0.881 to 0.882	0.882

Two Stage Regression

First Stage:

- Predict level of Liberalizing and Restrictive Index by country- and country-pair-specific characteristics
- Control for selection into IEAs with the same variables by Heckman selection model

Second Stage:

- Take residuals from first stage as „unexpected“ Liberalizing or Restrictive Index between countries in IEA
- Regress trade flows on these unexpected liberal and restrictive characters of IEA

Two-Stage: First Stage (Heckman)

	(1)	(2)	(3)		(1)	(2)	(3)
	Liberalizing Index	Restrictive Index	IEA		Liberalizing Index	Restrictive Index	IEA
DISTANCE	-0.033***	-0.003***	0.058***	EPI(IMP)	0.000***	-0.001***	-0.003
	(0.001)	(0.000)	(0.018)		(0.000)	(0.000)	(0.002)
CONTIGUITY	-0.020***	-0.008***	0.448	DEMOCRACY	0.001***	0.002***	0.029***
	(0.002)	(0.002)	(0.714)	(EXP)	(0.000)	(0.000)	(0.002)
COMMON	-0.024***	0.005***	0.338***	DEMOCRACY	0.002***	0.002***	0.029***
LANGUAGE	(0.001)	(0.001)	(0.069)	(IMP)	(0.000)	(0.000)	(0.003)
COLONY	-0.008***	-0.008***	-0.160	CORR(EXP)	0.000***	-0.000***	-0.006***
	(0.003)	(0.003)	(0.134)		(0.000)	(0.000)	(0.002)
COMMON	0.021***	0.011***	0.030	CORR(IMP)	0.000**	0.000***	-0.009***
COLONY	(0.001)	(0.001)	(0.061)		(0.000)	(0.000)	(0.001)
GDP(EXP)	0.000***	0.000***	0.000	CIVIL(EXP)	0.000***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
GDP(IMP)	0.000***	0.000***	-0.000	CIVIL(IMP)	0.000***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
POP(EXP)	0.000***	-0.000***	0.000	Constant	0.428***	0.423***	3.187***
	(0.000)	(0.000)	(0.000)		(0.006)	(0.005)	(0.266)
POP(IMP)	-0.000***	-0.000***	0.000	Mills /	-1.193***	-1.238***	
	(0.000)	(0.000)	(0.000)	Lambda	(0.350)	(0.301)	
EPI(EXP)	0.001***	0.000***	-0.004*	Observations	330067	330067	330067
	(0.000)	(0.000)	(0.002)				

Two-Stage: Second Stage

	(1)	(1)	(3)
	EXPORTS	EXPORTS	EXPORTS
Liberalizing Index	0.349***	0.340***	
(residual)	(0.085)	(0.084)	
Restrictive Index	-0.037		0.021
(residual)	(0.078)		(0.078)
IEA	-0.210	-0.213	-0.181
	(0.140)	(0.139)	(0.139)
Complexity	-0.024	-0.025	-0.006
	(0.017)	(0.017)	(0.017)
PTA	0.044	0.044	0.047
	(0.035)	(0.035)	(0.035)
Constant	8.498***	8.501***	8.463***
	(0.140)	(0.140)	(0.140)
Observations	330041	330041	330041
R²	0.894	0.894	0.894