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Bilateral Trade and Similarity of Income Distributions: The Role of Second Moments

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Abstract

We use an augmented gravity model to revisit the effect of similarity in income distributions on bilateral trade flows. Disentangling supply-side and demand-side mechanisms, we document a robust new regularity: while differences in average incomes between two countries increase trade, differences in income dispersion reduce it. Our result sheds new light on the Linder hypothesis and strengthens the role of non-homothetic preferences in trade theory.

JEL Code: F10, D31.
Keywords: International trade, income distribution, gravity model, Linder hypothesis, nonhomothetic preferences.

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1 Introduction

How do differences between countries' income distributions shape their bilateral trade flows? Supply-side and demand-side theories of international trade come up with conflicting answers. According to the Heckscher-Ohlin model, larger differences in capital-labor ratios of two countries (and, hence, in per capita incomes), result in stronger specialization and more trade. Demand-side arguments, originally proposed by Linder (1961) and recently formalized by Fajgelbaum et al. (2011), predict the opposite. If preferences are non-homothetic, countries with similar income distributions will demand similar goods. Due to a home market effect, they specialize in those goods, and trade them intensively with each other.

In this paper, we disentangle the two opposing effects by adding differences in the first and second moments of countries' income distributions into an otherwise standard gravity model. We uncover a robust empirical regularity: differences in per capita income between two countries increase their bilateral trade, while differences in income dispersion reduce it. The first effect is readily explained by supply-side forces and the second one is consistent with demand-side arguments.

A number of empirical studies have incorporated differences in per capita incomes across countries into the gravity model to test the Linder hypothesis.[1] Hallak (2010) shows that these studies fail to provide consistent support for an impact of the demand side on aggregate trade flows because they confound this effect with Heckscher-Ohlin forces. He takes the analysis to the sector level and finds that similarity in average incomes promotes sectoral trade.[2] We return to aggregate trade flows but propose a new approach to distinguish the positive and negative effects of similarity. We examine whether, beyond average incomes, the second moments of income distributions affect trade, and we find robust evidence that they do. By taking account of income distributions in both trading countries, we extend earlier work by Francois and Kaplan (1996) and Dalgin et al. (2008) on the relevance of importing country inequality.

Our results lend support to recent theoretical advances that study how the distributions of income *within* countries relate in determining bilateral trade flows. In Mitra and Trindade (2005), trade patterns are entirely shaped by specialization in consumption. Their model predicts that the *share* of intra-industry trade in overall trade is maximized when countries are identical in terms of income inequality. Fajgelbaum et al. (2011) and Markusen (2013) show how inequality interacts with per capita income differences to determine trade patterns in general equilibrium.

[1] Hallak (2010) surveys the most important contributions to this literature.

[2] In related work, Martínez-Zarzoso and Vollmer (2010) show that sectoral trade increases in the overlap of income distributions.

2 Gravity Model

The starting point of our empirical analysis is a standard gravity model,[3] which we augment by two terms capturing the similarity of the trading partners' income distributions. The main equation to be estimated explains the value of differentiated goods exports X_{ij} shipped from country i to country j:

$$\ln X_{ij} = \beta_y \Delta y_{ij} + \beta_\sigma \Delta\sigma_{ij} + \boldsymbol{\gamma}\mathbf{T}_{ij} + \delta_i + \delta_j + \varepsilon_{ij}, \tag{1}$$

by the difference in average incomes y: $$\Delta y_{ij} \equiv (\ln y_i - \ln y_j)^2 \tag{2}$$

and the difference in within-country income dispersion σ: $$\Delta\sigma_{ij} \equiv (\ln \sigma_i - \ln \sigma_j)^2 . \tag{3}$$

$\mathbf{T}_{ij}$ is a vector that collects the usual gravity covariates approximating trade costs: the log of bilateral distance, dummy variables for a common border, language, colonial link or colonizer, as well as lagged dummies indicating joint membership in a Free Trade Agreement (FTA), or in the World Trade Organization (WTO). To deal with unobserved multilateral resistance, we include importer and exporter fixed effects δ_i and δ_j. They make inclusion of purely monadic variables such as the level of GDP, y_i, or σ_j redundant and also absorb all monadic variation of variables contained in $\mathbf{T}_{ij}$.[4]

We are interested in estimates of β_y and β_σ. Clean identification of these parameters requires that the following identifying assumption on the conditional covariances holds: $cov\left(\Delta z_{ij}, \varepsilon_{ij} \middle| \delta_i, \delta_j, \mathbf{T}_{ij}\right) = 0, z \in \{y, \sigma\}$. Given the definition of Δz_{ij}, these requirements translate into

$$cov\left(z_i z_j, \varepsilon_{ij} \middle| \delta_i, \delta_j, \mathbf{T}_{ij}\right) = 0 \tag{4}$$

under the standard assumption that ε_{ij} has zero conditional mean. If z_i and z_j are independent, this identifying assumption is met. It requires that any trade shock ε_{ij} must be orthogonal to the joint realization of z in both countries. In other words, we need that aggregate conditions in country i are independent of aggregate conditions in country j. Clearly, this condition can be violated if i is an important trade partner for j or vice versa. We thus run robustness checks that eliminate each importer's five largest trading partners from the sample.

[3] See Head and Mayer (2014) for an excellent introduction into gravity modeling.

[4] When estimating (1) on panel data, we employ time-specific dummies δ_{it} and δ_{jt} and add a pair fixed-effect δ_{ij}. Note that we do not normalize the dispersion measures in (3) by the mean income in order to capture unconfounded variation in σ; the bilateral difference in average incomes is controlled for by Δy_{ij}. We provide robustness checks using alternative dispersion measures in the Appendix.

A positive estimate of β_y can be interpreted as evidence of Heckscher-Ohlin forces, while a negative sign favors the traditional Linder hypothesis. If the second moments capture similarity in demand, and if this promotes trade, we should observe $\beta_\sigma < 0$.

3 Data

We obtain the shares of total net income received by deciles of the population from the World Bank's World Development Indicators (WDI), complemented by Eurostat and the national statistics offices of the U.S. and Canada. Due to limited data availability, we take averages over 5-year periods: 1995-1999, 2000-2004, and 2005-2009. Dispersion measures are computed from all available quantiles within a given period. The resulting unbalanced panel includes 145 countries, of which 114 are available in the middle period.[5]

Disaggregate trade flows are obtained from the BACI dataset.[6] Since the arguments in the theoretical literature mostly relate to trade in differentiated goods, we select only those products (at the SITC 4 level) for which neither an organized exchange nor a reference price exists according to Rauch's (1999) 'liberal' classification and aggregate them up to obtain one trade flow per exporter, importer, and time period. We use data on population and GDP from the WDI and gravity controls are taken from CEPII and the WTO website.

4 Results

4.1 Main findings

The first three columns of Table 1 display our main results for the cross-section of 2000-2004.[7] The 'traditional' Linder test in column 1 suggests that differences in per capita incomes encourage trade rather than discourage it. Heckscher-Ohlin factors appear to outweigh the Linder mechanism. The alternative Linder test referring to second moments is reported in column 2. Differences in standard deviations between countries do not seem to affect trade in any way.

[5] The Appendix provides details on our selection and treatment of the data on income distributions and lists the countries and sectors in the dataset.

[6] The Base pour l'Analyse du Commerce International (BACI) of the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) is based on the UN Comtrade database and documented in Gaulier and Zignago (2010).

[7] Very similar results obtain in each period of our panel; see the Appendix, which also provides summary statistics.

Only if both terms Δy_{ij} and $\Delta\sigma_{ij}$ are included, a clear pattern emerges (column 3): *differences* in average incomes *across* countries promote trade as does the *similarity* of income distribution *within* countries. This finding suggests an amended, 'distributional' Linder mechanism: similarity in second moments of countries' income distributions fosters bilateral trade.

«TABLE 1 HERE»

Next, we exploit time variation in bilateral trade relationships to identify the effects of income distribution on trade. We eliminate all pair-specific effects by within-transformation. The estimates displayed in column 6 of Table 1 confirm our earlier findings. For example, they imply that trade between France and Hong Kong would increase by 2.5% if income in Hong Kong were redistributed such that its level of inequality were reduced to the level of France.[8] Interestingly, in contrast to the cross-sectional results, including either the difference in first or second moments individually yields negative coefficients on both (dis)similarity measures.

4.2 Robustness analysis

Table 2 explores the robustness of our results.[9] We start by addressing the obvious endogeneity concern. We first run robustness checks that eliminate each importer's five largest trading partners from the sample. Second, we substitute Δy and $\Delta\sigma$ by one-period lags, and third, we use these lags as instrumental variables (IV) for their contemporaneous values in 2SLS regressions. As displayed in Panel A of Table 2, our main results are robust to these modifications: the coefficients β_y and β_σ in columns 3, 6, and 9 preserve their signs and significance levels.

«TABLE 2 HERE»

The presence of zeros in bilateral trade data constitutes a well-known problem in estimating gravity models. Furthermore, Santos Silva and Tenreyro (2006) have shown that heteroskedasticity may introduce a bias in log-linear models such as equation (1). Therefore, following the guidance of Head and Mayer (2014), we apply Pseudo Maximum Likelihood estimators of the Poisson (PPML) and Gamma (ΓPML) types as well as Tobit regressions. Panel B of Table 2 shows that our results appear even stronger if these non-linear models are applied.

[8] These numbers refer to the second period of our sample (2000-2004), in which France and Hong Kong have approximately the same GDP per capita. The difference in standard deviations $\Delta\sigma = [\ln(24,453) - \ln(13,555)]^2 \approx 0.348$ thus reduces trade by the factor $\exp(-0.071 \times 0.212) \approx 0.976$. Eliminating this difference would boost trade by roughly $1/0.976 - 1 \approx 2.5\%$.

[9] In the Appendix, we provide a wide range of additional robustness checks.

Panel C divides the sample by the development status of trading partners and examines total aggregate trade flows. Confining the analysis to the sample of "northern" (industrialized) countries,[10] our benchmark results continue to hold despite the small number of observations. Similarly, when focusing on North-South trade (including flows in both directions), our main results remain intact. However, the North-North sample admits much larger coefficients on the (dis)similarity measures, which may be due to stronger forces of specialization and of demand similarities or due to lower measurement error in the dependent and independent variables.[11] The last group of regressions in Panel C shows that our results continue to hold if we consider total trade rather than trade in differentiated goods as the dependent variable.

The Appendix provides further robustness checks. To highlight a few of them, we confirm that our cross-sectional results carry through for different time periods, and that our panel regressions are qualitatively robust to using first differences or a balanced panel. We also experiment with alternative measures of (dis)similarity in income distributions (e.g. differences in Gini, Theil, and Atkinson indices as well as decile and quintile ratios) and find that sign patterns are robust. Finally, we show that our results cannot be explained by (dis)similarity in institutions (democratic orientation and economic freedom).

5 Interpretation of results and conclusion

We uncover a very robust stylized fact that has not been documented in the economics literature so far: differences in first and second moments of countries' income distributions matter for the volume of bilateral trade, but with opposite signs. While the two measures are positively correlated in the data, they do proxy different dimensions of (dis)similarity. Besides the Linder channel stressed by Hallak (2010), differences in mean incomes may capture the role of different endowment structures or development status. The positive trade effect of similarity in the dispersion of income is also reminiscent of Linder's argument, but it may alternatively reflect the impact of affinity in countries' societal structures determining the distribution of assets or the taste for fiscal redistribution. The observed pattern calls for further research to distinguish explanations based on non-homothetic preferences from other mechanisms.

[10] We distinguish high-income countries by their income per capita in 2011 according to the World Bank definition.

[11] Results for South-South trade (not shown) turn out insignificant, likely for similar reasons.

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Table 1: The Impact of (Dis)similarity in Income Distributions on Bilateral Trade

	Cross-section (2000-2004): OLS[a]			Panel (1995-2009): FE[b]		
	(1)	(2)	(3)	(4)	(5)	(6)
Δy_{ij}	0.0119***		0.148***	-0.0211**		0.0434**
	(0.00326)		(0.0132)	(0.00829)		(0.0198)
$\Delta \sigma_{ij}$		0.00378	-0.160***		-0.0311***	-0.0706***
		(0.00378)	(0.0153)		(0.00860)	(0.0205)
$\ln Dist_{ij}$	-1.404***	-1.390***	-1.429***			
	(0.0288)	(0.0287)	(0.0289)			
$BORDER_{ij}$	0.588***	0.600***	0.545***			
	(0.121)	(0.121)	(0.117)			
$LANGUAGE_{ij}$	0.806***	0.822***	0.785***			
	(0.0643)	(0.0643)	(0.0636)			
$COLONY_{ij}$	1.012***	1.014***	0.992***			
	(0.106)	(0.108)	(0.106)			
$COMCOL_{ij}$	1.220***	1.196***	1.193***			
	(0.0880)	(0.0880)	(0.0873)			
$WTO_{ij,t-1}$	0.505***	0.504***	0.389***	0.323***	0.307***	0.309***
	(0.0915)	(0.0919)	(0.0923)	(0.0799)	(0.0799)	(0.0798)
$FTA_{ij,t-1}$	0.307***	0.268***	0.387***	0.00705	-0.00716	-0.00954
	(0.0474)	(0.0466)	(0.0478)	(0.0458)	(0.0458)	(0.0459)
δ_{it} & δ_{jt}	yes	yes	yes	yes	yes	yes
N	10,669	10,669	10,669	31,160	31,160	31,160
Pairs				16,405	16,405	16,405
R^2	0.858	0.857	0.859	0.445	0.445	0.445

Estimations of variants of equation (1). The dependent variable is the natural logarithm of the aggregate value of bilateral trade in differentiated goods: $\ln X_{ijt}$.

Robust standard errors clustered by country pair in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

All regressions include a constant and importer- and exporter-dummies (δ_{it} & δ_{jt}), which vary over time in case of Fixed Effects (FE) regressions.

[a] Columns 1-3 refer to the cross-section in the middle period of our panel (2000-2004).

[b] Columns 4-6 are based on the full panel of three 5-year periods (1995-1999, 2000-2004, 2005-2009).

Table 2: Robustness analysis

***A.** Endogeneity concerns*

	OLS: excluding 5 largest trading partners ($N = 10,113$)[a]			OLS: Lags ($N = 6,688$)[b]			IV: Lags ($N = 6,688$)[c]		
				L.Δy	L.$\Delta\sigma$	both	L.Δy	L.$\Delta\sigma$	both
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δy	0.00442		0.128***	0.0453***		0.157***	0.0474***		0.189***
	(0.00344)		(0.0139)	(0.00425)		(0.0151)	(0.00440)		(0.0205)
$\Delta\sigma$		-0.00362	-0.144***		0.0390***	-0.131***		0.0412***	-0.161***
		(0.00393)	(0.0159)		(0.00489)	(0.0172)		(0.00511)	(0.0235)
R^2	0.842	0.842	0.843	0.873	0.872	0.874	0.873	0.872	0.874

***B.** Heteroskedasticity and zeros*

	PPML ($N = 12,808$)[d]			ΓPML ($N = 12,808$)[d]			Tobit ($N = 12,808$)[d,e]		
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Δy	0.0566***		0.183***	0.0273***		0.164***	0.0455***		0.252***
	(0.00637)		(0.0236)	(0.00413)		(0.0174)	(0.00364)		(0.0152)
$\Delta\sigma$		0.0505***	-0.160***		0.0200***	-0.158***		0.0357***	-0.241***
		(0.00692)	(0.0271)		(0.00476)	(0.0200)		(0.00422)	(0.0175)
LL	-296797886	-288482217	-279285436	-98226	-98267	-98110	-23423	-23462	-23326

***C.** Subsamples*

	OLS: North-North ($N = 702$)[f]			OLS: North-South ($N = 4,537$)[g]			OLS: Total trade ($N = 11,182$)[h]		
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Δy	-0.000474		0.515***	0.0313*		0.206***	0.00125		0.157***
	(0.0368)		(0.0933)	(0.0160)		(0.0467)	(0.00309)		(0.0128)
$\Delta\sigma$		-0.0923**	-0.682***		0.0123	-0.194***		-0.00947***	-0.183***
		(0.0406)	(0.0986)		(0.0166)	(0.0482)		(0.00358)	(0.0148)
R^2	0.942	0.943	0.947	0.880	0.880	0.881	0.835	0.835	0.837

Estimations of variants of equation (1) for the cross-section in 2000-2004. The dependent variable is the natural logarithm of the aggregate value of bilateral trade in differentiated goods: $\ln X_{ijt}$. All regressions include the control variables from Table 1. Full results are available from the authors on request.

Robust standard errors clustered by country pair in parentheses: *** p<0.01, ** p<0.05, * p<0.1

[a] In columns 1-3, the five largest source countries for every importer have been omitted.

[b] In columns 4-6, the main regressors Δy and $\Delta\sigma$ are lagged by one period.

[c] Columns 7-9 use these lags as instruments. F-statistics in first stage regressions: 1024 for (7), 557 for (8), 1026 for Δy and 666 for $\Delta\sigma$ in (9).

[d] Columns 10-18 apply Maximum Likelihood estimation to the full sample, including zero trade flows. LL indicates the log-likelihood.

[e] Tobit regressions use the smallest observed trade flow as a left-censoring value.

[f] Columns 19-21 restrict the sample to trade among high-income countries (according to the World Bank definition).

[g] Columns 22-24 examine North-South trade between high-income countries and low-income or middle-income countries (both directions).

[h] Columns 25-27 consider total trade (including non-differentiated goods).

APPENDIX TO

EPPINGER & FELBERMAYR

"Bilateral Trade and Similarity of Income Distributions: The Role of Second Moments"

A Construction of second moments

The comparability of available cross-country data on the distribution of net income (i.e., after taxation and including non-labor incomes) is not without caveats. When constructing our (dis)similarity measures, we balance three considerations. First, we seek to maximize the size of the sample for statistical inference and relevance of our results. Second, to ensure the best possible comparability, we choose a minimum number of different sources. Third, we use the most recently available data, as their quality has arguably improved over time.

For most countries in the sample, we use data from the World Bank's World Development Indicators (WDI) on the shares of income received by each quintile as well as the first and tenth decile of the population. These shares are based on nationally representative household surveys and are only in exceptional cases derived from grouped data. They are adjusted for household size and treated in a consistent manner.

The WDI data base contains little information on income distribution in high-income countries. Therefore, we complement the quantiles with corresponding data on 19 EU countries, Norway, and Switzerland from Eurostat, as well as income distributions of the U.S. and Canada from the respective national statistics offices. Eurostat income shares are based on disposable household income broken down to the individual level. Data from the U.S. Census and Statistics Canada only include quintiles derived from after-tax income of families.[12] Where they are in conflict, we prefer WDI data if available at least once per 5-year period for consistency reasons. Otherwise, we choose the source for which the longer time series is available, as listed in Table B.3.

From the distributional data on quintiles Q and deciles D, we obtain the income y_i held by the average individual in each quantile $q_i,\ i = \{D1, D2, Q2, Q3, Q4, D9, D10\}$ by using data on GDP Y and population L. We then compute the standard deviation σ from the mean incomes of all quantiles available within a given 5-year period, weighting each data point by the share of the population it represents.

[12] Given that the data from the WDI and Eurostat overlap for a few years and countries, we can conduct consistency checks and find that the differences in general are small.

B Summary statistics and sample composition

Table B.1: Summary statistics for cross-section in 2000-2004

Variable	Mean	Std. dev.	Min.	Max.	Obs.
GDP per capita y (US$)	6,693	11,151	125	47,861	
Standard deviation of income distribution σ (US$)	4,462	6,450	79	28,994	114
Total exports (million US$)[a]	23,674	62,688	5	415,442	
$\ln X^{\text{a,b}}$	6.725	3.896	-1.609	18.617	10,669
Δy	5.082	6.298	0	35.401	
$\Delta \sigma$	4.414	5.347	0	34.881	
$\ln Distance^{\text{c}}$	8.628	0.814	4.088	9.894	
$BORDER$	0.025	0.155	0	1	
$LANGUAGE$	0.092	0.289	0	1	12,808
$COLONY$	0.016	0.127	0	1	
$COMMON\ COLONIZER$	0.057	0.231	0	1	
WTO	0.676	0.448	0	1	
FTA	0.191	0.386	0	1	

Summary statistics are reported for averages over the period 2000-2004. The top panel refers to individual countries. The bottom panel summarizes bilateral variables used in the regressions. Statistics for the full panel are available from the authors on request.
[a] All trade values refer to trade in differentiated goods only, selected by the liberal classification of Rauch (1999).
[b] $\ln X$ refers to the natural logarithm of bilateral trade in million US$. 2,139 trade flows are equal to zero.
[c] $\ln Distance$ refers to the natural logarithm of the bilateral distance between the most popuplous cities in kilometers.

Table B.2: List of differentiated goods sectors at SITC 3-digit level

Sector (SITC 3)														
1	111	269	524	598	651	662	693	718	737	761	778	812	851	892
11	121	271	533	611	652	663	694	721	741	762	781	821	871	893
34	211	273	541	613	653	664	695	722	742	763	782	831	872	894
48	212	277	551	621	654	665	696	723	743	764	783	842	873	895
56	223	278	553	625	655	666	697	724	744	771	784	843	874	896
57	233	291	554	628	656	667	699	725	745	772	785	844	881	897
58	244	292	572	633	657	672	711	726	749	773	786	845	882	898
61	245	322	583	634	658	673	713	727	751	774	791	846	883	899
71	248	323	584	635	659	678	714	728	752	775	792	847	884	941
73	267	335	591	641	661	679	716	736	759	776	793	848	885	951
98	268	431	592	642										

Each SITC 3 sector only contains the products classified as differentiated at the SITC 4-digit level by Rauch's (1999) liberal classification. These trade flows are aggregated by exporter, importer and 5-year period for our analysis.

Table B.3: List of countries

	Country	Periods	Source	N/S		Country	Periods	Source	N/S
1.	Afghanistan	3	WDI	S	74.	Kenya	1,3	WDI	S
2.	Albania	1,2,3	WDI	S	75.	Korea, Rep.	1	WDI	N
3.	Algeria	1	WDI	S	76.	Kyrgyz Republic	1,2,3	WDI	S
4.	Angola	2	WDI	S	77.	Lao PDR	1,2,3	WDI	S
5.	Argentina	1,2,3	WDI	S	78.	Latvia	1,2,3	WDI	N
6.	Armenia	1,2,3	WDI	S	79.	Liberia	3	WDI	S
7.	Austria	1,2,3	EU	N	80.	Lithuania	1,2,3	WDI	S
8.	Azerbaijan	1,2,3	WDI	S	81.	Macedonia, FYR	1,2,3	WDI	S
9.	Bangladesh	1,2,3	WDI	S	82.	Madagascar	1,2,3	WDI	S
10.	Belarus	1,2,3	WDI	S	83.	Malawi	1,2	WDI	S
11.	Belgium-Luxembourg	1,2,3	EU	N	84.	Malaysia	1,2,3	WDI	S
12.	Belize	1	WDI	S	85.	Maldives	1,2	WDI	S
13.	Benin	2	WDI	S	86.	Mali	2,3	WDI	S
14.	Bhutan	2,3	WDI	S	87.	Malta	3	EU	N
15.	Bolivia	1,2,3	WDI	S	88.	Mauritania	1,2,3	WDI	S
16.	Bosnia Herzegovina	2,3	WDI	S	89.	Mexico	1,2,3	WDI	S
17.	Brazil	1,2,3	WDI	S	90.	Moldova	1,2,3	WDI	S
18.	Bulgaria	1,2,3	WDI	S	91.	Mongolia	1,2,3	WDI	S
19.	Burkina Faso	1,2,3	WDI	S	92.	Morocco	1,2,3	WDI	S
20.	Burundi	1,3	WDI	S	93.	Mozambique	1,2,3	WDI	S
21.	Cambodia	2,3	WDI	S	94.	Nepal	1,2	WDI	S
22.	Cameroon	1,2,3	WDI	S	95.	Netherlands	1,2,3	EU	N
23.	Canada	1,2,3	nat	N	96.	New Zealand	1	WDI	N
24.	Cape Verde	2	WDI	S	97.	Nicaragua	1,2,3	WDI	S
25.	Central African Rep.	2,3	WDI	S	98.	Niger	3	WDI	S
26.	Chad	2	WDI	S	99.	Nigeria	1,2	WDI	S
27.	Chile	1,2,3	WDI	S	100.	Norway	2,3	W&E	N
28.	China	1,2,3	WDI	S	101.	Pakistan	1,2,3	WDI	S
29.	Colombia	1,2,3	WDI	S	102.	Panama	1,2,3	WDI	S
30.	Comoros	2	WDI	S	103.	Papua New Guinea	1	WDI	S
31.	Congo, Dem. Rep.	3	WDI	S	104.	Paraguay	1,2,3	WDI	S
32.	Congo, Rep.	3	WDI	S	105.	Peru	1,2,3	WDI	S
33.	Costa Rica	1,2,3	WDI	S	106.	Philippines	1,2,3	WDI	S
34.	Cote d'Ivoire	1,2,3	WDI	S	107.	Poland	1,2,3	WDI	N
35.	Croatia	1,2,3	WDI	N	108.	Portugal	1,2,3	EU	N
36.	Cyprus	3	EU	N	109.	Romania	1,2,3	WDI	S
37.	Czech Republic	1,3	W&E	N	110.	Russian Federation	1,2,3	WDI	S
38.	Denmark	1,2,3	W&E	N	111.	Rwanda	2,3	WDI	S
39.	Djibouti	2	WDI	S	112.	São Tomé & Principe	2	WDI	S
40.	Dominican Republic	1,2,3	WDI	S	113.	Senegal	2,3	WDI	S

Table B.3: Countries *(continued)*

	Country	Periods	Source	N/S		Country	Periods	Source	N/S
41.	Ecuador	1,2,3	WDI	S	114.	Seychelles	3	WDI	S
42.	Egypt, Arab Rep.	1,2,3	WDI	S	115.	Sierra Leone	2	WDI	S
43.	El Salvador	1,2,3	WDI	S	116.	Singapore	1	WDI	N
44.	Estonia	1,2,3	W&E	N	117.	Slovak Republic	1,2,3	WDI	N
45.	Ethiopia	1,2,3	WDI	S	118.	Slovenia	1,2,3	W&E	N
46.	Fiji	2,3	WDI	S	119.	South Africa	1,2,3	WDI	S
47.	Finland	1,2,3	EU	N	120.	Spain	1,2,3	EU	N
48.	France	1,2,3	EU	N	121.	Sri Lanka	1,2,3	WDI	S
49.	Gabon	3	WDI	S	122.	St. Lucia	1	WDI	S
50.	Gambia	1,2	WDI	S	123.	Sudan	3	WDI	S
51.	Georgia	1,2,3	WDI	S	124.	Suriname	1	WDI	S
52.	Germany	1,2,3	EU	N	125.	Sweden	2,3	W&E	N
53.	Ghana	1,3	WDI	S	126.	Switzerland	2,3	W&E	N
54.	Greece	1,2,3	EU	N	127.	Syrian Arab Rep.	2	WDI	S
55.	Guatemala	1,2,3	WDI	S	128.	Tajikistan	1,2,3	WDI	S
56.	Guinea	2,3	WDI	S	129.	Tanzania	2,3	WDI	S
57.	Guinea-Bissau	2	WDI	S	130.	Thailand	1,2,3	WDI	S
58.	Guyana	1	WDI	S	131.	Togo	3	WDI	S
59.	Haiti	2	WDI	S	132.	Tunisia	1,2,3	WDI	S
60.	Honduras	1,2,3	WDI	S	133.	Turkey	2,3	WDI	S
61.	Hong Kong	1	WDI	N	134.	Turkmenistan	1	WDI	S
62.	Hungary	1,2,3	WDI	N	135.	Uganda	1,2,3	WDI	S
63.	Iceland	2,3	EU	N	136.	Ukraine	1,2,3	WDI	S
64.	India	3	WDI	S	137.	United Kingdom	1,2,3	EU	N
65.	Indonesia	1,2,3	WDI	S	138.	United States	1,2,3	nat	N
66.	Iran	1,3	WDI	S	139.	Uruguay	1,2,3	WDI	S
67.	Iraq	3	WDI	S	140.	Uzbekistan	1,2	WDI	S
68.	Ireland	1,2,3	EU	N	141.	Venezuela, RB	1,2,3	WDI	S
69.	Israel	2	WDI	N	142.	Vietnam	1,2,3	WDI	S
70.	Italy	1,2,3	EU	N	143.	Yemen	1,3	WDI	S
71.	Jamaica	1,2	WDI	S	144.	Zambia	1,2,3	WDI	S
72.	Jordan	1,2,3	WDI	S	145.	Zimbabwe	1	WDI	N
73.	Kazakhstan	1,2,3	WDI	S					

Periods indicate when all data for estimation are available: 1 (1995-1999), 2 (2000-2004), 3 (2005-2009).
Sources of income distribution data: World Development Indicators (WDI), Eurostat (EU), both (W&E), national (nat).
Income status according to World Bank: South (S): low and middle-income countries. North (N): high income countries.

C Additional results and robustness checks

Table C.1: Additional results and robustness checks

A. Subsamples and panel							
	(1) OLS: Period 1	(2) OLS: Period 3	(3) FD: Full Panel[a]	(4) FD: Balanced[a,b]	(5) FE: Balanced[b]	(6) OLS: WDI	(7) OLS: Eurostat
Δy	0.174***	0.128***	0.0326	0.0358	0.164***	0.0181	0.299
	(0.0138)	(0.0125)	(0.0199)	(0.0249)	(0.0124)	(0.0242)	(0.216)
$\Delta\sigma$	-0.187***	-0.139***	-0.0348*	-0.0558**	-0.147***	-0.0804***	-0.292
	(0.0158)	(0.0143)	(0.0200)	(0.0253)	(0.0140)	(0.0243)	(0.307)
N	8,804	11,687	14,028	11,066	17,275	6,796	272
R^2	0.850	0.856	0.158	0.165	0.467	0.791	0.953

B. Alternative inequality measures[c]							
	(8) $\|\Delta y\|$ & $\|\Delta\sigma\|$	(9) $\Delta\sigma(\ln y)$	(10) $\Delta Gini$	(11) $\Delta Theil$[d]	(12) $\Delta Atkinson$[d]	(13) ΔDR	(14) ΔQR
Δy	0.498***	0.0115***	0.0119***	0.0119***	0.0115***	0.0103***	0.0114***
	(0.0529)	(0.00328)	(0.00326)	(0.00326)	(0.00327)	(0.00359)	(0.00328)
Δ inequality	-0.486***	-0.293	-0.433	-0.116	-1.219*	-0.0391***	-0.0426*
	(0.0556)	(0.183)	(0.827)	(0.471)	(0.673)	(0.0124)	(0.0230)
N	10,669	10,669	10,669	10,669	10,669	10,220	10,669
R^2	0.859	0.858	0.858	0.858	0.858	0.851	0.858

C. Similarity of institutions and data management							
	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	Δ Polity IV[e]		Δ EFW[e]		Conserv. Rauch[f]	real GDP[g]	real GDP PPP[g]
Δy	0.217***	0.0294***	0.196***	0.0138***	0.149***	0.151***	0.172***
	(0.0171)	(0.00504)	(0.0163)	(0.00480)	(0.0131)	(0.0124)	(0.0162)
$\Delta\sigma$	-0.224***		-0.225***		-0.162***	-0.167***	-0.212***
	(0.0203)		(0.0197)		(0.0153)	(0.0144)	(0.0200)
Δ Polity IV	-0.120	-0.176**					
	(0.0743)	(0.0774)					
Δ EFW			0.326	-0.682			
			(0.571)	(0.587)			
N	5,975	5,975	6,766	6,766	10,695	10,559	10,669
R^2	0.890	0.887	0.887	0.884	0.859	0.860	0.859

Estimations of equation (1) in the main text. The dependent variable is the natural logarithm of the aggregate value of bilateral trade in differentiated goods: $\ln X_{ijt}$. All regressions include the control variables from Table 1 in the paper and refer to the cross-section in the second period of the sample (2000-2004) for columns 6-22. Full results are available from the authors on request.
Robust standard errors clustered by country pair in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
[a] In First Differences (FD) estimations, columns 3 and 4, the dependent variable is $\ln X_t - \ln X_{t-1}$. All regressors are differenced accordingly.
[b] Columns 4 and 5 restrict the panel to countries for which data are available in all three periods (balanced panel).
[c] Panel B replaces Δ inequality with, respectively, absolute (instead of squared) bilateral differences in $\ln\sigma$ (column 8), squared bilateral differences in σ derived from log-income distributions (9), in Gini (10), Theil (11), and Atkinson (12) indices, in decile ratios (DR, no deciles available for Canada and USA, 13) and in quintile ratios (QR, 14).
[d] For technical reasons, Theil and Atkinson indices have been computed by year and then aggregated over 5-year periods.
[e] Columns 15-18 control for squared bilateral differences in Polity IV and Economic Freedom of the World (EFW) indices, respectively.
[f] Column 19 uses the conservative (instead of the liberal) classification of Rauch (1999).
[g] In columns 20-21, Δy and $\Delta\sigma$ are computed from deflated GDP and deflated GDP converted to Purchasing Power Parity (PPP), respectively.

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