

# Appendix

## List of Tables

A1	Predicting average total trade using Rose (2004) and Goldstein, Rivers, and Tomz (2007), 1948–1999 . . . . .	3
A2	Predicting average total trade using Rose (2004) and Goldstein, Rivers, and Tomz (2007) using maximum values for undirected dyads, 1948–1999 . . . . .	4
A3	Table 1 from the manuscript, using Gleditsch’s Expanded GDP and Trade data (2002), 1950-2000 . . . . .	5
A4	Table 2 from the manuscript, using Gleditsch’s Expanded GDP and Trade data (2002), 1950-2000 . . . . .	6
A5	Table 3 from the manuscript, using Gleditsch’s Expanded GDP and Trade data (2002), 1950-2000 . . . . .	7
A6	Table 1 from the manuscript, excluding the United States . . . . .	8
A7	Table 3 from the manuscript, excluding the United States . . . . .	9
A8	Table 2 from the manuscript, using maximum instead of minimum values . .	10

## Description for the Rose (2004) and Goldstein, Rivers, and Tomz (2007) estimations

### Research Design

The undirected dyad models allows for another test of the causal variables of interest by employing current international political economy work in estimating bilateral trade activity in the context of the gravity model. Employing the estimation initiated by Rose (2004) and critiqued and expanded upon by Goldstein, Rivers and Tomz (2007), I use the undirected-dyad framework to estimate the effect of power concentration on trade. The previous research sought to identify if membership in the GATT or WTO independently facilitated trade from other liberalization trends. Consequently, this further test also examines whether regional or global trends exert an independent influence from the international institutions and trade agreements that support trade liberalization. The Rose (2004) estimations employ yearly fixed effects in place of the lagged dependent variable.

The dependent variable is the average value of real bilateral trade that Rose (2004) draws from the *International Monetary Fund* (Goldstein, Rivers and Tomz 2007). This series of estimations cover 1948–1999.

In the Rose (2004) and Goldstein, Rivers and Tomz (2007) estimations, I employ the data used by the previous research that models the average value of real bilateral trade between countries as a function of the natural log of the product of both countries' GDP ( $\ln(GDP_{ij})$ ), the log of the product of both countries' GDP per capita ( $\ln(GDPPC_{ij})$ ), a binary variable for joint GATT/WTO membership ( $WTO_{ij}$ ), a binary variable that takes the value of one if only one member of the dyad is party to the GATT or WTO ( $WTO_{i\oplus j}$ ), a binary variable for if both countries are part of a mutual regional trade agreement ( $RTA_{ij}$ ), a binary variable for if the countries belong to distinct RTAs ( $RTA_{i\oplus j}$ ), a binary variable for if both countries are part of a currency union ( $Currency\ Union_{ij}$ ), a binary variable for if either country benefits from the Generalized System of Preferences ( $GSP_{i\cup j}$ ), and a final binary variable measuring whether both countries are part of a common colonial relationship ( $Colonial_{ij}$ ).

The full model from Rose (2004) also includes the log of distance, if both countries share a common language, if the countries share a land border, the number of landlocked countries in the dyad, the number of islands in the dyad, and the log of the product of the two countries' land area; however, due to dyadic fixed effects, these variables drop out of the estimation both in the work done by Goldstein, Rivers and Tomz (2007) and continue to do so in the analysis presented here.

Table A1: Predicting average total trade using Rose (2004) and Goldstein, Rivers, and Tomz (2007), 1948–1999

	(1)	(2)	(3)
	Total Trade	Total Trade	Total Trade
Disparity <sub>max</sub>		-0.3381*** (0.1173)	
Regional Dominance <sub>max</sub>			0.0496 (0.1245)
Strict Currency Union <sub>AB</sub>	0.7274*** (0.1334)	0.4975*** (0.1501)	0.5341*** (0.1310)
Current Colonies <sub>AB</sub>	-3.0956*** (0.0286)	-3.3611*** (0.0274)	-3.0818*** (0.0286)
RTA <sub>AB</sub>	0.7622*** (0.0989)	0.4630*** (0.1180)	0.7210*** (0.1014)
ln(GDP) <sub>AB</sub>	0.4618*** (0.0496)	0.5035*** (0.0550)	0.4718*** (0.0509)
ln(GDP/PC) <sub>AB</sub>	0.1822*** (0.0477)	0.1140** (0.0533)	0.1623*** (0.0491)
RTA <sub>A⊕B</sub>	0.0088 (0.0218)	0.0738** (0.0301)	0.0210 (0.0242)
WTO <sub>A⊕B</sub>	0.1096** (0.0437)	0.1144** (0.0501)	0.1414*** (0.0440)
WTO <sub>AB</sub>	0.2274*** (0.0486)	0.2319*** (0.0556)	0.2593*** (0.0491)
GSP <sub>A∪B</sub>	0.1206*** (0.0296)	0.0945*** (0.0328)	0.0850*** (0.0298)
Constant	-1135.9780 (1314.8054)	130.8254 (10330582.7758)	60.2526 (1317.1833)
$R^2$	0.119	0.116	0.121
Observations	206358	161781	194380

\* p ≤ 0.10; \*\* p ≤ 0.05; \*\*\* p ≤ 0.01

Each model employs clustered standard errors for the undirected-dyad.

Table A2: Predicting average total trade using Rose (2004) and Goldstein, Rivers, and Tomz (2007) using maximum values for undirected dyads, 1948–1999

	(1)	(2)	(3)
	Total Trade	Total Trade	Total Trade
Disparity <sub>max</sub>		-0.3600*** (0.1343)	
Regional Dominance <sub>max</sub>			0.0859 (0.1375)
Strict Currency Union <sub>AB</sub>	0.7592*** (0.1399)	0.5299*** (0.1602)	0.5616*** (0.1385)
Current Colonies <sub>AB</sub>	-3.0950*** (0.0307)	-3.3565*** (0.0298)	-3.0826*** (0.0308)
RTA <sub>AB</sub>	0.7897*** (0.1043)	0.4851*** (0.1255)	0.7503*** (0.1069)
ln(GDP) <sub>AB</sub>	0.4839*** (0.0520)	0.5277*** (0.0580)	0.4944*** (0.0535)
ln(GDPPC) <sub>AB</sub>	0.1606*** (0.0500)	0.0893 (0.0561)	0.1401*** (0.0516)
RTA <sub>A⊕B</sub>	0.0054 (0.0225)	0.0703** (0.0310)	0.0170 (0.0249)
WTO <sub>A⊕B</sub>	0.1115** (0.0450)	0.1141** (0.0518)	0.1429*** (0.0455)
WTO <sub>AB</sub>	0.2273*** (0.0503)	0.2289*** (0.0577)	0.2585*** (0.0509)
GSP <sub>A∪B</sub>	0.1366*** (0.0319)	0.1122*** (0.0354)	0.1007*** (0.0321)
Constant	37.7685** (16.6290)	51.2966** (22.9249)	52.9528*** (19.5898)
$R^2$	0.116	0.113	0.118
Observations	200829	156948	189048

\* p ≤ 0.10; \*\* p ≤ 0.05; \*\*\* p ≤ 0.01

Each model employs clustered standard errors for the undirected-dyad.

Table A3: Table 1 from the manuscript, using Gleditsch's Expanded GDP and Trade data (2002), 1950-2000

	(1)	(2)	(3)	(4)	(5)
	Imports	Imports AB	Imports AB	Imports AB	Imports AB
Disparity <sub>A</sub>		-0.0859*** (0.0109)	-0.1160*** (0.0436)		
Disparity <sub>B</sub>		-0.0945*** (0.0113)	-0.0944*** (0.0113)		
Disparity Interaction <sub>A</sub>			0.0957 (0.1350)		
Regional Dominance <sub>A</sub>				-0.1101*** (0.0146)	0.0411 (0.0479)
Regional Dominance <sub>B</sub>				-0.0948*** (0.0150)	-0.0947*** (0.0150)
Dominance Interaction <sub>A</sub>					-0.4859*** (0.1497)
Concentration	-0.2013*** (0.0260)	-0.2195*** (0.0322)	-0.2842*** (0.1019)	-0.1865*** (0.0272)	0.1014 (0.0968)
CINC <sub>US</sub>	-0.4236*** (0.0579)	-0.4479*** (0.0700)	-0.4474*** (0.0700)	-0.4343*** (0.0607)	-0.4261*** (0.0607)
CINC <sub>A</sub>	1.6023*** (0.2478)	1.6094*** (0.2691)	1.6117*** (0.2693)	1.6614*** (0.2551)	1.6613*** (0.2546)
CINC <sub>B</sub>	1.4265*** (0.2551)	1.4139*** (0.2897)	1.4139*** (0.2896)	1.5154*** (0.2643)	1.5155*** (0.2644)
ln(Pop) <sub>A</sub>	-0.0191*** (0.0069)	-0.0103 (0.0077)	-0.0104 (0.0077)	-0.0213*** (0.0071)	-0.0211*** (0.0071)
ln(Pop) <sub>B</sub>	-0.0344*** (0.0071)	-0.0233*** (0.0080)	-0.0233*** (0.0080)	-0.0349*** (0.0073)	-0.0349*** (0.0073)
War	-0.0777*** (0.0028)	-0.0839*** (0.0031)	-0.0839*** (0.0031)	-0.0776*** (0.0028)	-0.0774*** (0.0028)
ln(Imports)	0.7573*** (0.0023)	0.7470*** (0.0026)	0.7470*** (0.0026)	0.7542*** (0.0024)	0.7542*** (0.0024)
Constant	-23.4540*** (1.0284)	-26.3137*** (1.2463)	-26.2959*** (1.2458)	-23.6994*** (1.0773)	-23.8224*** (1.0766)
$R^2$	0.645	0.631	0.631	0.642	0.642
Observations	1006160	783636	783636	957572	957572

Each model employs clustered standard errors for the directed-dyad. \* p≤ 0.10; \*\* p≤ 0.05; \*\*\* p≤0.01

Table A4: Table 2 from the manuscript, using Gleditsch's Expanded GDP and Trade data (2002), 1950-2000

	(1)	(2)	(3)	(4)	(5)
	Total Trade	Total Trade	Total Trade	Total Trade	Total Trade
Disparity <sub>max</sub>		-0.1410*** (0.0234)	-0.4715*** (0.1162)		
Disparity Interaction <sub>max</sub>			1.0516*** (0.3562)		
Regional Dominance <sub>max</sub>				-0.1638*** (0.0243)	0.0170 (0.0832)
Dominance Interaction <sub>max</sub>					-0.5845** (0.2630)
Concentration	-0.2621*** (0.0382)	-0.2809*** (0.0475)	-1.1524*** (0.3095)	-0.2532*** (0.0399)	0.1635 (0.1993)
CINC <sub>US</sub>	-0.6548*** (0.0880)	-0.7465*** (0.1063)	-0.7376*** (0.1065)	-0.6899*** (0.0923)	-0.6853*** (0.0921)
CINC <sub>max</sub>	1.7415*** (0.2563)	1.8280*** (0.2869)	1.8303*** (0.2866)	1.7959*** (0.2648)	1.8067*** (0.2646)
ln(pop) <sub>max</sub>	-0.0418*** (0.0101)	-0.0309*** (0.0115)	-0.0304*** (0.0115)	-0.0399*** (0.0104)	-0.0408*** (0.0104)
War	-0.0824*** (0.0040)	-0.0885*** (0.0045)	-0.0882*** (0.0045)	-0.0829*** (0.0041)	-0.0828*** (0.0041)
ln(Total trade)	0.7590*** (0.0030)	0.7495*** (0.0034)	0.7494*** (0.0034)	0.7562*** (0.0031)	0.7562*** (0.0031)
Constant	-24.7699*** (1.4910)	-27.0286*** (1.7891)	-26.7884*** (1.7847)	-24.8833*** (1.5623)	-25.0559*** (1.5586)
$R^2$	0.664	0.651	0.651	0.662	0.662
Observations	503080	391818	391818	478786	478786

Each model employs clustered standard errors for the undirected-dyad. \* p ≤ 0.10; \*\* p ≤ 0.05; \*\*\* p ≤ 0.01

Table A5: Table 3 from the manuscript, using Gleditsch's Expanded GDP and Trade data (2002), 1950-2000

	(1)	(2)	(3)	(4)
	Imports Gleditsch	Imports Gleditsch	Total Trade	Total Trade
Disparity	-0.8026** (0.3976)		-0.7702* (0.4190)	
Regional Dominance		-0.0736 (0.7192)		-0.0151 (0.7533)
Concentration	-14.7591*** (0.9964)	-14.9161*** (1.0144)	-15.7077*** (1.0560)	-15.8683*** (1.0761)
CINC <sub>US</sub>	35.3718*** (1.7597)	35.5653*** (1.7806)	38.4935*** (1.8714)	38.7009*** (1.8926)
ln(Pop)	-0.4398** (0.1808)	-0.4558** (0.1884)	-0.4879** (0.1881)	-0.5010** (0.1954)
War	-0.1486 (0.1607)	-0.1403 (0.1598)	-0.1971 (0.1734)	-0.1886 (0.1727)
CINC <sub>A</sub>	-1.2569 (5.6545)	-1.6360 (6.0044)	-0.6693 (5.7514)	-1.0650 (6.0976)
ln(Imports)	0.2189*** (0.0225)	0.2224*** (0.0232)		
ln(Total trade)			0.2172*** (0.0222)	0.2209*** (0.0227)
Constant	203.9148*** (9.6610)	203.3277*** (10.0581)	219.5526*** (10.1844)	219.1126*** (10.5671)
$R^2$	0.786	0.785	0.787	0.786
Observations	10515	10515	10515	10515

\* p≤ 0.10; \*\* p≤ 0.05; \*\*\* p≤0.01

Each model employs clustered standard errors for each country.

Table A6: Table 1 from the manuscript, excluding the United States

	(1)	(2)	(3)	(4)	(5)
	Imports AB	Imports AB	Imports AB	Imports AB	Imports AB
Disparity <sub>A</sub>		-0.0554*** (0.0111)	-0.0512* (0.0287)		
Disparity <sub>B</sub>		-0.0549*** (0.0122)	-0.0549*** (0.0122)		
Disparity Interaction <sub>A</sub>			-0.0131 (0.0851)		
Regional Dominance <sub>A</sub>				-0.0989*** (0.0156)	0.0455 (0.0324)
Regional Dominance <sub>B</sub>				-0.1005*** (0.0157)	-0.1007*** (0.0157)
Dominance Interaction <sub>A</sub>					-0.4508*** (0.0915)
Concentration	-0.1958*** (0.0295)	-0.2125*** (0.0344)	-0.2040*** (0.0685)	-0.2001*** (0.0310)	0.0582 (0.0631)
CINC <sub>US</sub>	-0.6976*** (0.0402)	-0.8535*** (0.0468)	-0.8538*** (0.0468)	-0.7394*** (0.0418)	-0.7371*** (0.0418)
CINC <sub>A</sub>	2.5794*** (0.2223)	2.5392*** (0.2497)	2.5401*** (0.2506)	2.6021*** (0.2282)	2.6160*** (0.2291)
CINC <sub>B</sub>	2.6738*** (0.2406)	2.6030*** (0.2750)	2.6029*** (0.2750)	2.6940*** (0.2467)	2.6875*** (0.2466)
ln(pop) <sub>A</sub>	-0.0239*** (0.0064)	-0.0190*** (0.0072)	-0.0190*** (0.0072)	-0.0259*** (0.0066)	-0.0257*** (0.0066)
ln(pop) <sub>B</sub>	-0.0723*** (0.0067)	-0.0690*** (0.0076)	-0.0690*** (0.0076)	-0.0740*** (0.0070)	-0.0742*** (0.0070)
War	-0.0793*** (0.0032)	-0.0858*** (0.0035)	-0.0858*** (0.0035)	-0.0786*** (0.0033)	-0.0783*** (0.0033)
ln(Imports)	0.7772*** (0.0021)	0.7737*** (0.0023)	0.7738*** (0.0023)	0.7744*** (0.0021)	0.7745*** (0.0021)
Constant	-18.8411*** (0.5153)	-18.7730*** (0.5702)	-18.7734*** (0.5703)	-18.5333*** (0.5235)	-18.5664*** (0.5250)
$R^2$	0.701	0.694	0.694	0.698	0.698
Observations	1007748	809511	809511	957172	957172

\* p ≤ 0.10; \*\* p ≤ 0.05; \*\*\* p ≤ 0.01

Each model employs clustered standard errors for the directed-dyad.



Table A7: Table 3 from the manuscript, excluding the United States

	(1)	(2)	(3)	(4)
	Imports COW	Imports COW	Total Trade	Total Trade
Disparity	-0.2341*		-0.2703**	
	(0.1220)		(0.1282)	
Regional Dominance		-0.5040***		-0.5264***
		(0.1776)		(0.1831)
Concentration	4.2345***	4.2779***	4.6370***	4.6773***
	(0.3804)	(0.3824)	(0.4069)	(0.4096)
CINC <sub>US</sub>	-1.6007***	-1.6360***	-1.2828**	-1.3110**
	(0.5002)	(0.4986)	(0.5227)	(0.5195)
ln(Pop)	0.1811***	0.1546***	0.1890***	0.1606***
	(0.0471)	(0.0499)	(0.0477)	(0.0512)
War	-0.4245***	-0.4217***	-0.4396***	-0.4365***
	(0.0974)	(0.0982)	(0.1030)	(0.1039)
CINC <sub>A</sub>	-0.6098	-0.3486	-1.0538	-0.7850
	(1.8262)	(1.8174)	(1.9328)	(1.9137)
ln(Imports)	0.7717***	0.7701***		
	(0.0124)	(0.0121)		
ln(Total trade)			0.7862***	0.7849***
			(0.0118)	(0.0115)
Constant	8.6709**	7.8469*	13.7660***	12.9097***
	(4.2510)	(4.1611)	(4.1305)	(4.0425)
$R^2$	0.799	0.799	0.800	0.800
Observations	10389	10389	10389	10389

\*  $p \leq 0.10$ ; \*\*  $p \leq 0.05$ ; \*\*\*  $p \leq 0.01$

Each model employs clustered standard errors for each country.

Table A8: Table 2 from the manuscript, using maximum instead of minimum values

	(1)	(2)	(3)	(4)	(5)
	Total Trade	Total Trade	Total Trade	Total Trade	Total Trade
Disparity <sub>max</sub>		-0.1444*** (0.0247)	-0.1539** (0.0722)		
Disparity Interaction <sub>max</sub>			0.0302 (0.2163)		
Regional Dominance <sub>max</sub>				-0.1741*** (0.0250)	0.1520*** (0.0558)
Dominance Interaction <sub>max</sub>					-1.0241*** (0.1603)
Concentration	-0.2654*** (0.0443)	-0.2848*** (0.0516)	-0.3092* (0.1870)	-0.2729*** (0.0465)	0.4282*** (0.1218)
CINC <sub>US</sub>	-0.6669*** (0.0606)	-1.1666*** (0.0672)	-1.1660*** (0.0669)	-1.0861*** (0.0604)	-1.0900*** (0.0605)
CINC <sub>max</sub>	5.6424*** (0.3104)	2.4446*** (0.2951)	2.4441*** (0.2954)	2.5155*** (0.2727)	2.5160*** (0.2736)
ln(Pop) <sub>sum</sub>	-0.0224*** (0.0067)	-0.0200*** (0.0073)	-0.0199*** (0.0073)	-0.0261*** (0.0068)	-0.0258*** (0.0068)
War	-0.0941*** (0.0048)	-0.1025*** (0.0053)	-0.1025*** (0.0053)	-0.0946*** (0.0049)	-0.0941*** (0.0049)
ln(Total trade)	0.7700*** (0.0028)	0.7741*** (0.0031)	0.7741*** (0.0031)	0.7728*** (0.0029)	0.7728*** (0.0029)
Constant	-23.1842*** (0.7466)	-17.3783*** (0.8003)	-17.3759*** (0.8029)	-17.4105*** (0.7323)	-17.4687*** (0.7386)
$R^2$	0.716	0.713	0.713	0.714	0.714
Observations	473077	387293	387293	456474	456474

\* p≤ 0.10; \*\* p≤ 0.05; \*\*\* p≤0.01

Each model employs clustered standard errors for the undirected-dyad.

## References

- Goldstein, Judith L, Douglas Rivers and Michael Tomz. 2007. "Institutions in international relations: Understanding the effects of the GATT and the WTO on world trade." *International Organization* 61(1):37–67.
- Rose, Andrew. 2004. "Do we really know that the WTO increases trade?" *American Economic Review* 94(1):98–114.