

# Does Initial Inequality Prevent Trade Development? A Political-Economy Approach\*

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*We develop a model in which government maximizes political support subject to the redistributive nature of trade liberalization. The model predicts that initial inequality between labor and capital income is inversely related to government's trade liberalization propensity. Empirically, we support this conclusion by showing that unequal countries have joined the General Agreement on Tariffs and Trade later than equal countries.*

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## 1. Introduction

Although the effects of trade on the distribution of income are theoretically well explored, the effects of initial income inequality on trade liberalization are much less understood. In fact, Mitra (1999, p. 1118) complains that it “is a much neglected aspect of the current literature.” Similarly, Hwang and Jung (2002, p. 405) lament that “few attempts have been made to analyze the linkage between inequality and trade protection.”

In line with the literature on the positive theory of regulation (Stigler, 1971; Peltzman, 1976; Becker, 1983), we develop a model in which the initial functional income inequality of a country

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enters the political support maximization function for trade liberalization. We define trade liberalization as a government's willingness to increase the income of the abundant production factor and decrease the income of the scarce one through the realization of a trade development opportunity. This trade development opportunity takes place in a Heckscher-Ohlin scenario that is based on reciprocity, such as is the case of an accession to GATT.

How does our model differ from existing theoretical papers? Existing models that incorporate initial inequality on the formation of tariffs emphasize political capture by special interest groups, holding constant existing trade opportunities. Our paper assumes that a government is subject to an initial capture by special interest groups, but confronted with a new trade opportunity to which it must respond with a politically optimal trade liberalization level. Thus, the principal difference between our model and the ones prevailing in the literature is that existing approaches are predominantly concerned with transitions from more to less trade. We move in the other direction and explain why countries liberalize more or less. A closer look at the political-economy models of trade illustrates this point further.

In the endogenous tariff-formation function approach, competing lobbyist activities are modeled, one coming from an industry opposing free trade and the other from an industry promoting it (Findlay and Wellisz, 1982). Each group best responds to the other group's lobbying activity and a Nash equilibrium is determined. Similarly, models of campaign contributions (Magee et al., 1989) and political contributions (Grossman and Helpman, 1994) examine the responsiveness of government to lobbyist activities. Lobbyists thus rule over government. In essence, these approaches model how different interest groups capture government assuming given trade opportunities. The equilibrium is final in the sense that it defines a tariff rate and distribution of income.

Another important paper addressing endogenous trade policy is Mayer (1984), who argues that voting participation costs are crucial in allowing minority groups to promote their own interests at the expense of a majority. This makes their analysis more relevant to developed than to developing countries, where electoral procedures are mostly absent. We believe that when most developing countries decide on whether they should be more outward or inward-oriented, the median voter framework is not appropriate. Important for our analysis, however, is the conclusion of Mayer that the initial distribution of resource endowments matters.

In summary, the above political economy models are all concerned with the formation of a tariff; the government comes under pressure from special interest groups in an environment of given trade opportunities. By contrast, our model emphasizes a scenario in which special interest groups come under pressure from the government as a result of a new trade opportunity. Thus,

our model can be used to explain advances in trade liberalization under GATT and its effect on the trade liberalization calculus of governments. We note here that our model delivers a key prediction: the initial functional income inequality (between labor and capital) adversely affects the extent of trade liberalization of a government. This theoretical result is broadly consistent with the findings in Hwang and Jung (2002). Using five-year-interval panel observations from 73 countries between the 1970s and 1990s, Hwang and Jung show that countries with higher initial asset inequality liberalize less.

The rest of the paper is structured as follows. In section 2, we present the theoretical model and derive its predictions. We test our model's predictions in section 3. We conclude with a summary of our main findings in section 4.

## 2. The Model

We assume that a country has an abundant and a scarce production factor. Trade liberalization will lead to an increase in income of the abundant and decrease in income of the scarce production factor. After government is confronted with a new trade opportunity, it must choose its level of trade liberalization. The two pre-policy aggregate factor incomes are labeled  $AFY^*$  and  $SFY^*$ , representing the abundant and scarce production factor incomes, respectively. Their values are determined by exogenous factors such as economic structure and geography. Politicians maximize the political support function (PS):

$$PS = SFY^\sigma \cdot AFY^{1-\sigma} \quad (1)$$

where  $SFY$  and  $AFY$  are, respectively, the scarce and abundant factor incomes after trade liberalization, and  $\sigma$  is the marginal political support elasticity of the scarce production factor. As opposed to median voter models, for example, this function is more general and applicable to countries operating under both democratic and authoritarian regimes. As opposed to lobbying models, which let initial factor incomes enter the model through lobbying power and thus make government endogenous, our specification allows for the incorporation of initial political capture.

We assume that the political equilibrium prior to trade liberalization is optimal in the sense that it reflects the actual income distribution. Hence:

$$\sigma = \frac{SFY^*}{Y^*} \text{ and } 1 - \sigma = \frac{AFY^*}{Y^*}, \text{ where } Y^* = SFY^* + AFY^* \quad (2)$$

The above formulation implies that the greater is the share of aggregate income accruing to a factor, the greater is its relative political weight.

Politicians maximize political support subject to the income-redistributive nature of trade liberalization. Trade liberalization (TL) leads to a decline of income of the scarce production factor and an increase of income of the abundant production factor, with the abundant production factor gaining more than the scarce production factor losing. This can be written as

$$AFY = AFY^* + \alpha TL \quad (3)$$

$$SFY = SFY^* - \beta TL \quad (4)$$

where  $\alpha > \beta > 0$ . The parameters  $\alpha$  and  $\beta$  are the marginal income changes associated with trade liberalization. Trade liberalization can be thought of as a transition from an initial prohibitive tariff to a reduced tariff, which will inevitably trigger the income redistributing changes. The income that politicians can redistribute through trade liberalization is then

$$\Delta SFY = - \frac{\beta}{\alpha} \Delta AFY \quad (5)$$

Figure 1 summarizes graphically the logic behind equations (1) to (5). The south-east and south-west quadrants show the change of income of the abundant and scarce production factor as trade liberalization approaches full openness. The north-east quadrant shows the income redistribution line associated with trade liberalization.

For policy makers to opt for trade liberalization in the political support function  $\{SFY^*, AFY^*\}$ , it is required that the (absolute) marginal rate of income substitution prior to trade liberalization (point A),  $dSFY/dAFY$ , is greater than the (absolute) slope of the income redistribution frontier,  $\beta/\alpha$ . This conditions obviously always holds as

$$\frac{(1-\sigma) SFY^*}{\sigma AFY^*} = 1 > \frac{\beta}{\alpha} \quad (6)$$

In order to maximize political support, policy makers will equate scarce and abundant factor incomes according to

$$\frac{(1-\sigma)}{\sigma} \frac{SFY}{AFY} = MRS = \frac{\beta}{\alpha} \quad (7)$$

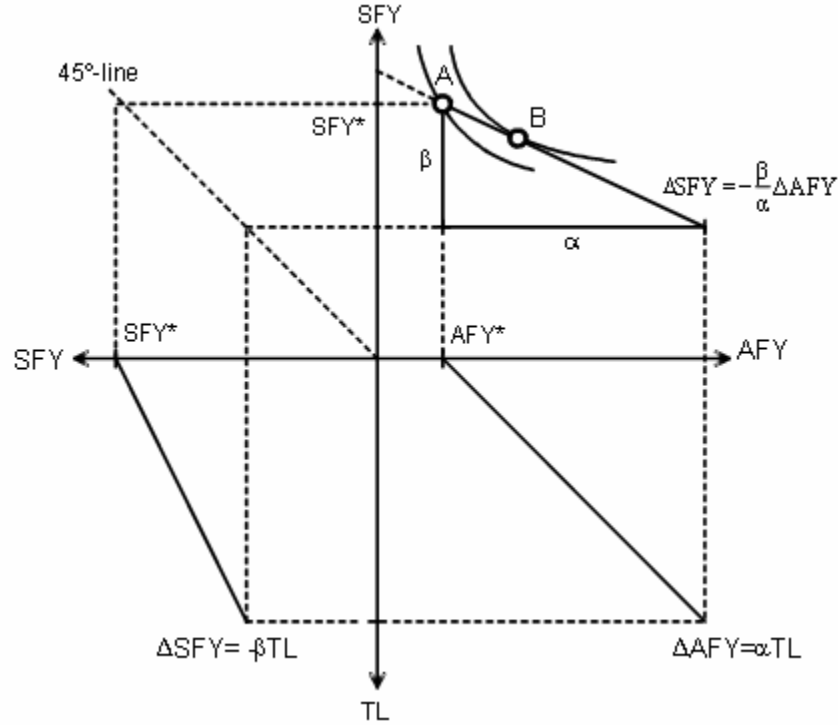


Figure 1: Trade Liberalization, Redistribution, and Political Support Maximization

which, since  $AFY = AFY^* + \alpha TL$  and  $SFY = SFY^* - \beta TL$ , can be written as

$$\frac{dSFY}{dAFY} = \frac{(1-\sigma)}{\sigma} \frac{(SFY^* - \beta TL)}{(AFY^* - \alpha TL)} = \frac{\beta}{\alpha} \quad (8)$$

**Proposition 1:** The optimal trade liberalization level is a function of the initial income shares.

Specifically, solving (8) for TL yields:

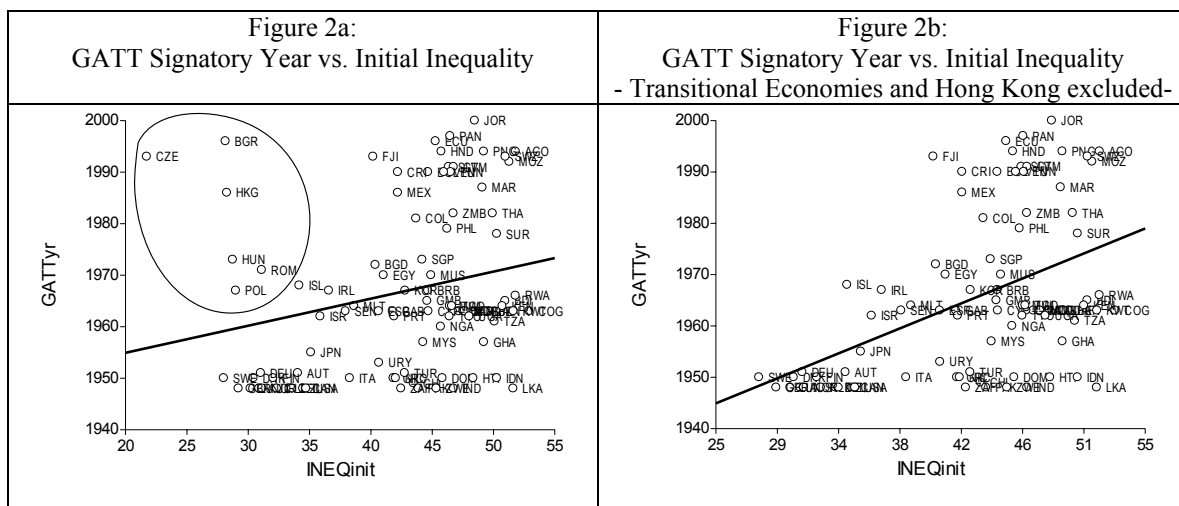
$$TL_{opt.} = \frac{(1-\sigma)}{\beta} \left( SFY^* + \frac{\beta}{\alpha} AFY^* \right) - \frac{AFY^*}{\alpha} \quad (9)$$

**Proposition 2:** Holding initial aggregate income,  $SFY^* + AFY^*$ , fixed and maximizing (9) with respect to  $SFY^*$  shows that trade liberalization is at a maximum when initial factor incomes are equal (i.e.,  $SFY^* = Y^*/2 = AFY^*$ ).

### 3. Empirical Relevance of the Model

As the development of new trade opportunities has been predominantly associated with the various GATT rounds, we examine whether countries with greater equality become GATT members earlier than countries with higher inequality. At least most countries could freely choose to become a GATT member, with the socialist countries in Eastern and Central Europe being the exception.

A scatter plot informally addresses this intuition. The scatter plot in Figure 2 depicts the GATT signatory year (GATTyr) on the y-axis and the average level of income inequality for the 1963-1975 period on the x-axis. We use this average inequality level as a proxy for initial income inequality (INEQinit). Ideally, we would want country-specific measures of income inequality from an earlier time; such data are, to the best of our knowledge, unavailable. However, since income inequality varies only a little over time, we believe that the conclusions of our empirical exercise are nevertheless valid.



**Figure 2:** GATT Membership and Income Inequality

Figure 2a suggests a weakly upward sloping trend line but also a potential bias caused by transitional economies in Eastern and Central Europe (encircled). These economies were not necessarily free in making their own political choices until the 1989 fall of the Berlin Wall. Hong Kong, which had a special dependency status, is also part of this cluster. Therefore, removing these countries from the sample leaves a selection of countries which were freer in their political choices. This is done in Figure 2b, which shows that the relationship between GATTyr and INEQinit is in fact much more significant.

In order to formally test the hypothesis of whether a country's propensity to join GATT is related to initial inequality, we built the following data set. For each GATT member country  $i$ , we obtain data on three variables: the year in which country  $i$  became a GATT member, its initial per capita income ( $Y_{init}$ ), and its initial income inequality ( $INEQ_{init}$ ). These initial values are averages for the 1961 to 1975 period. In total, we obtain data for 114 countries with 77 complete observations. The Appendix provides the data set used in the paper.

Our data sources are as follows. The GATT signatory years were taken from the World Trade Organization web site ([http://www.wto.org/english/thewto\\_e/gattmem\\_e.htm](http://www.wto.org/english/thewto_e/gattmem_e.htm) and [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org6\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm)). Per capita income is GDP per capita in constant 2000 USD and obtained from the 2007 World Bank Development Indicator Database. The income inequality variable, which reads like a Gini coefficient, is the Estimated Household Inequality Indicator (EHII) from the University of Texas Income Inequality Data Project (<http://utip.gov.utexas.edu/data.html>).

Our theoretical model draws a causal link between the initial functional income inequality of a country and its trade aversion. Unfortunately our inequality variable, EHII, refers to popular income inequality. While theoretical arguments linking these two inequality measures can be furnished, our empirical results should nonetheless be viewed with caution.

The model that we estimate by ordinary least squares is as follows:

$$Gatt\ Signatory\ Year_i = \beta_0 + \beta_1 INEQ_{init_i} + \beta_2 Reg.\ Dummy_i + \beta_3 Y_{init_i} + \varepsilon_i$$

We expect the coefficient on  $INEQ_{init}$  to be positive and statistically significant. Our regression results are given in Table 1.

**Table 1:** Regression Results

	Model I	Model II	Model III	Model IV	Model V	Model VI
Const	1944*** (9.5)	1951*** (8.7)	1991*** (8.1)	2015*** (11.2)	1934*** (25.7)	1936***
Initial Inequality	0.53** (0.22)	1.09*** (0.24)			-0.73** (0.37)	1.17*** (0.38)
Initial Income (ln)			-3.21*** (1.08)	-3.37*** (1.04)	-0.01 (1.63)	1.17 (1.61)
Transition Dummy		32.1*** (7.0)		Numbers Missing!!		30.8*** (11.1)
Adj. R <sup>2</sup>	4.8%	22.2%	7.4%	14.8%	7.8%	15.4%
F-Stat	5.6	13.9	8.8	9.4	4.2	5.6
N	93	93	98	98	77	77

\*\*\* = significant at 1%, \*\*significant at 5%, standard errors in parentheses.

Model I shows that initial income inequality is statistically significant at the 5% level, even without controlling for the transitional countries. Upon introducing a transition dummy in Model II, the significance of the initial income inequality measure jumps to 1%. By itself, initial per capita income is statistically significant at the 1% level, indicating that rich countries become GATT members earlier than the poor countries (Model III). This significance also holds when initial per capita income and the transition dummy are introduced simultaneously (Model IV). When initial income inequality and initial per capita income feature jointly on the right hand side, initial income inequality stays significant at the 5% level while initial per capita income loses its significance (Model V). The same result holds when adding the transition dummy to the specification of Model V (Model VI). Initial income inequality is therefore the most robust predictor of GATT membership.

#### 4. Conclusions

The trade literature emphasizes the effects of trade on the distribution of income while comparatively little attention is given to the question of whether initial income inequality is in fact a source of trade policy. When the latter question is addressed, then the literature focuses on how initial income inequality translates into more protection. In contrast, we examine how initial income inequality affects trade liberalization decisions.

We incorporate initial functional income inequality into a standard political-support maximization model in which a policymaker chooses a politically optimal trade liberalization

level. The model is based on the standard assumption that trade creates winners (the owners of the abundant factor) and losers (the owners of the scarce one), and that the winners win more from free trade than the losers lose. Then, assuming that policymakers rest in a political support maximization equilibrium prior to deciding on the optimal trade liberalization level, our model shows that perfect income equality between the two identified groups lead to the maximal trade liberalization level. Although our theoretical model focuses on functional income inequality, we argue that functional income inequality and popular income inequality are correlated. We test our theoretical model by determining whether countries with lower initial income inequality joined GATT earlier. Our empirical results support this hypothesis.

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**Appendix: Dataset**

Nr.	Country	Code	GATTyr	INEQinit	INCinit	Transition Dummy
1	Angola	AGO	1994	51.82	n/a	0
2	Argentina	ARG	1967	n/a	8.73	0
3	Australia	AUS	1948	30.90	9.31	0
4	Austria	AUT	1951	34.06	9.25	0
5	Bangladesh	BGD	1972	40.38	5.55	0
6	Barbados	BRB	1967	44.67	8.57	0
7	Belgium	BEL	1948	33.37	9.25	0
8	Belize	BLZ	1983	n/a	7.07	0
9	Benin	BEN	1963	49.65	5.70	0
10	Bolivia	BOL	1990	44.67	6.90	0
11	Botswana	BWA	1987	n/a	6.11	0
12	Brazil	BRA	1948	n/a	7.50	0
13	Bulgaria	BGR	1996	28.16	n/a	1
14	Burkina Faso	BFA	1963	49.09	5.07	0
15	Burundi	BDI	1965	50.96	4.62	0
16	Cameroon	CMR	1963	47.19	6.14	0
17	Canada	CAN	1948	34.48	9.43	0
18	Central African Republic	CAF	1963	49.29	5.82	0
19	Chad	TCD	1963	n/a	5.44	0
20	Chile	CHL	1949	43.50	7.65	0
21	China	CHN	2001	n/a	4.61	0
22	Colombia	COL	1981	43.70	7.05	0
23	Congo, Dem. Rep.	COD	1971	n/a	5.79	0
24	Congo, Rep.	COG	1963	52.91	6.56	0
25	Costa Rica	CRI	1990	42.21	7.80	0
26	Cote d'Ivoire	CIV	1963	46.69	6.63	0
27	Cyprus	CYP	1963	44.70	n/a	0
28	Czech Republic	CZE	1993	21.74	n/a	1
29	Denmark	DNK	1950	30.44	9.73	0
30	Dominican Republic	DOM	1950	45.85	6.88	0
31	Ecuador	ECU	1996	45.29	6.84	0
32	Egypt, Arab Rep.	EGY	1970	41.05	6.36	0
33	El Salvador	SLV	1991	46.35	7.55	0
34	Fiji	FJI	1993	40.20	7.24	0
35	Finland	FIN	1950	32.05	9.24	0
36	France	FRA	1948	n/a	9.32	0
37	Gabon	GAB	1963	41.78	8.03	0

## Dataset (Contd.)

38	Gambia, The	GMB	1965	44.60	n/a	0
39	Georgia	GEO	2000	n/a	6.82	1
40	Germany	DEU	1951	31.04	n/a	0
41	Ghana	GHA	1957	49.23	5.64	0
42	Greece	GRC	1950	41.85	8.59	0
43	Guatemala	GTM	1991	46.76	7.13	0
44	Guyana	GUY	1966	n/a	6.59	0
45	Haiti	HTI	1950	48.36	6.59	0
46	Honduras	HND	1994	45.76	6.62	0
47	Hong Kong, China	HKG	1986	28.27	8.60	1
48	Hungary	HUN	1973	28.75	7.71	1
49	Iceland	ISL	1968	34.17	9.49	0
50	India	IND	1948	46.75	5.27	0
51	Indonesia	IDN	1950	50.28	5.34	0
52	Ireland	IRL	1967	36.59	8.79	0
53	Israel	ISR	1962	35.89	9.05	0
54	Italy	ITA	1950	38.29	9.06	0
55	Jamaica	JAM	1963	47.55	8.01	0
56	Japan	JPN	1955	35.13	9.57	0
57	Jordan	JOR	2000	48.48	n/a	0
58	Kenya	KEN	1964	50.73	5.54	0
59	Korea, Rep.	KOR	1967	42.80	7.44	0
60	Kuwait	KWT	1963	51.64	10.72	0
61	Latvia	LVA	1999	n/a	7.58	1
62	Lesotho	LSO	1988	n/a	5.07	0
63	Luxembourg	LUX	1948	30.20	9.63	0
64	Madagascar	MDG	1963	47.65	5.95	0
65	Malawi	MWI	1964	46.44	4.79	0
66	Malaysia	MYS	1957	44.27	6.97	0
67	Malta	MLT	1964	38.64	7.41	0
68	Mauritania	MRT	1963	n/a	5.71	0
69	Mauritius	MUS	1970	44.92	n/a	0
70	Mexico	MEX	1986	42.21	8.12	0
71	Morocco	MAR	1987	49.10	6.52	0
72	Mozambique	MOZ	1992	51.30	n/a	0
73	Nepal	NPL	2004	n/a	4.96	0
74	Netherlands	NLD	1948	32.34	9.37	0
75	New Zealand	NZL	1948	33.57	9.46	0

76	Nicaragua	NIC	1950	42.04	7.26	0
77	Niger	NER	1963	n/a	5.79	0
78	Nigeria	NGA	1960	45.71	5.79	0
79	Norway	NOR	1948	31.15	9.60	0
80	Oman	OMN	2000	n/a	7.93	0
81	Pakistan	PAK	1948	43.88	5.51	0
82	Panama	PAN	1997	46.48	7.83	0
83	Papua New Guinea	PNG	1994	49.22	6.35	0
84	Paraguay	PRY	1994	n/a	6.77	0
85	Peru	PER	1951	n/a	7.61	0
86	Philippines	PHL	1979	46.23	6.58	0
87	Poland	POL	1967	29.00	n/a	1
88	Portugal	PRT	1962	41.91	8.24	0
89	Romania	ROM	1971	31.12	n/a	1
90	Rwanda	RWA	1966	51.81	5.36	0
91	Senegal	SEN	1963	37.95	6.16	0
92	Sierra Leone	SLE	1961	n/a	5.55	0
93	Singapore	SGP	1973	44.20	8.28	0
94	South Africa	ZAF	1948	42.47	7.93	0
95	Spain	ESP	1963	40.65	8.73	0
96	Sri Lanka	LKA	1948	51.62	5.77	0
97	St. Vincent and the Grenadines	VCT	1993	n/a	7.18	0
98	Suriname	SUR	1978	50.29	n/a	0
99	Swaziland	SWZ	1993	50.98	n/a	0
100	Sweden	SWE	1950	28.02	9.61	0
101	Switzerland	CHE	1966	n/a	10.08	0
102	Tanzania	TZA	1961	50.09	n/a	0
103	Thailand	THA	1982	49.94	6.17	0
104	Togo	TGO	1964	46.62	5.66	0
105	Trinidad and Tobago	TTO	1962	46.42	8.40	0
106	Tunisia	TUN	1990	46.52	6.72	0
107	Turkey	TUR	1951	42.77	n/a	0
108	Uganda	UGA	1962	48.03	n/a	0
109	United Kingdom	GBR	1948	29.22	9.43	0
110	United States	USA	1948	34.73	9.77	0
111	Uruguay	URY	1953	40.67	8.26	0
112	Venezuela, RB	VEN	1990	45.97	8.74	0
113	Zambia	ZMB	1982	46.74	6.32	0
114	Zimbabwe	ZWE	1948	45.35	6.24	0