

Which International Institutions Promote International Trade?

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Preliminary; Comments Welcome.

Abstract

This paper estimates the effect on international trade of three multilateral organizations intended to increase trade: 1) the World Trade Organization (WTO) and its predecessor the Generalized Agreement on Tariffs and Trade (GATT), 2) the International Monetary Fund (IMF); and 3) the Organization for Economic Cooperation and Development (OECD). I use a standard “gravity” model of bilateral merchandise trade and a large panel data set covering over fifty years and 175 countries. My results indicate that OECD membership (but neither GATT/WTO nor IMF membership) has had a consistently large positive effect on trade.

Keywords: empirical, bilateral, panel, gravity, GATT, WTO, IMF, OEEC, OECD, panel.

JEL Classification Numbers: F13, F15

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Many economists believe that international trade is good for growth and development; almost none believe it is bad. Accordingly, a number of international organizations encourage trade. In this short paper I ask: which multilateral agencies are effective in promoting trade? More precisely, I compare the effects on trade of membership in three prominent institutions: 1) the World Trade Organization (WTO) and its predecessor the Generalized Agreement on Tariffs and Trade (GATT), 2) the International Monetary Fund (IMF), and 3) the Organization for Economic Cooperation and Development (OECD), and its predecessor the Organization for European Economic Co-operation (OEEC).

One might expect the GATT/WTO to have the biggest effect on trade, since it is primarily concerned with trade. The IMF is also interested in trade creation and has the power of lending with conditionality, but might be expected to have a smaller effect on trade since it has a number of other worries. Finally, the OECD is a small club with a wide range of issues and no clear benefits or power. Yet in practice I find that the OECD has the largest effect on trade. My benchmark estimate is that membership in the OECD boosts trade by over 50% holding other things constant, an amount that is both robust and economically and statistically significant.

In the next section, I motivate my choice of the three international organizations, while section 2 lays out the empirical methodology and data set. The heart of the paper is the third section, which presents the results and sensitivity analysis; section 4 is a brief conclusion.

1: Trade Liberalization as an Objective

Three international organizations have trade liberalization as part of their mandate: 1) the WTO, 2) the IMF, and 3) the OECD.

It is uncontroversial to argue that the WTO is in the business of liberalizing trade, as was the GATT before it. The WTO describes itself in *WTO in Brief*, the first sentence of which states “... In brief, the World Trade Organization (WTO) is the only international organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible...”¹ Similar statements may be found for the GATT.

It is somewhat less clear that the IMF is interested in trade liberalization. Nevertheless, the *Articles of Agreement of the International Monetary Fund* clearly states in “Article I (Purposes)” that “The purposes of the International Monetary Fund are: ... (ii) To facilitate the expansion and balanced growth of international trade, ...”² The IMF seems to take this objective seriously. For instance, in 1999 its managing director Michel Camdessus argued that the IMF attempts to liberalize trade in several ways, including: 1) promoting the macroeconomic and structural environment for trade liberalization; 2) encouraging members to remove restrictions on current account transactions; and 3) encouraging countries to adopt more outward-oriented policies.³ Alternatively, in 2001 the Fund’s key Policy Development and Review Department issued *Trade Policy Conditionality in Fund-Supported Programs*, which begins “Trade liberalization has been a key element of Fund-supported programs over the past twenty years. This stems from the purposes of the Fund ...”⁴ The Fund has the ability to put its desires into practice since it lends with conditionality, and program conditions often involve trade liberalization (as summarized in PDR’s document). In *IMF Structural Programs*, Morris Goldstein confirms that trade liberalization has been important in IMF conditionality (see e.g., his Figures 1 and 3).⁵

Of course the IMF has numerous competing objectives, including: promoting monetary and exchange stability, encouraging current account and exchange liberalization, reducing payments imbalances, and encouraging high employment and income. These might be expected to moderate the effect of Fund membership on trade.

The OECD is probably the most controversial organization I examine, since many do not realize that its mandate includes trade liberalization. Nevertheless, the *Convention on the Organisation for Economic Co-operation and Development* includes in its preamble: “Recognizing that the further expansion of world trade is one of the most important factors favouring the economic development of countries and the improvement of international economic relations ...” and includes in Article 1 “The aims of the Organization for Economic Co-operation and Development ... shall be to promote policies designed: ... (c) to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.” Further, Article 2 states that “In the pursuit of these aims, the Members agree that they will, both individually and jointly: ... (d) pursue their efforts to reduce or abolish obstacles to the exchange of goods and services ...”⁶

Indeed, the history of the organization makes the point clearly, as shown by DeLong and Eichengreen (1991). The OEEC, forerunner of the OECD, was formed to administer American and Canadian aid under the Marshall Plan for reconstruction of Europe after World War II. To quote materials from the OECD’s website (italics added):⁷

“A crisis hit the Marshall Plan in autumn 1949. The Americans were changing their policy regarding aid, *which they considered insufficiently directed towards economic integration*. Formerly, Marshall Plan credit had been used mainly to make up the European countries' dollar balance deficit. The United States was now prepared to provide credits, for the final two years of aid, on the basis of an intra-European action programme. In October-November 1949 the head of the ECA, Paul Hoffman, complained to the OEEC *that it was not making enough proposals for freeing trade*. Under this pressure, the Europeans arrived at an agreement to free 50% of private import trade in foodstuffs, manufactured products and raw materials. These were measures of limited scope, since the liberation related only to a joint list of products, and a large part of the

trade remained State trade. Nonetheless, by the end of 1950, 60% of private intra-European trade had been freed thanks to OEEC action, a percentage that rose to 84% in 1955 and 89% in 1959...

“Another outstanding act of co-operation was the creation of the European Payments Union under OEEC auspices in September 1950... Organisation of the EPU led to the creation of the necessary compensation fund to balance intra-European deficits by determining a quota for each country. The quota would act as a reference for automatic settlement of surpluses. An EPU common fund was also established to which each member would contribute up to 60% of its quota. The EPU was dissolved on 27 December 1958 when the currencies were declared convertible with dollars. *EPU negotiations had been accompanied by consideration of methods of freeing trade.*”

The OECD has a number of “legal instruments” and “acts” to back up its determination to liberalize trade. For instance, the *Recommendation of the Council on Administrative and Technical Regulations which Hamper the Expansion of Trade* recommends that “Member Governments keep under review their administrative and technical regulations in order to eliminate those provisions which are not essential for the purpose of the regulation and which hamper trade.”⁸ Further, the *Declaration on Trade Policy* signed by OECD members in 1980 reaffirms “policies to contribute to the expansion of world trade on a multilateral basis and ... efforts to reduce or abolish obstacles to the exchange of goods and services” while declaring the OECD’s determination “to maintain and improve the open and multilateral trading system ... to implement fully and effectively the commitments made in the Multilateral Trade Negotiations, both in their letter and spirit; to avoid measures which might erode the achievement of these negotiations; and to continue their efforts towards further improvements in such areas which were not covered by the negotiations or where adequate results have not yet been achieved” and much more in the same vein, especially with regard to developing countries.⁹

Consistent with all this, the accession process for joining the OECD involves trade liberalization (among other things). The OECD states that as part of the membership process “Each country must have demonstrated its attachment to the basic values shared by all OECD members: an open market economy, democratic pluralism and respect for human rights.”¹⁰

Nevertheless, membership in the OECD comes with no visible sanctions or rewards that can be used to encourage trade liberalization. Further, the OECD has broad interests; for instance trade is one of only over thirty “themes” on its homepage.

To summarize, three prominent international organizations are interested in trade liberalization. The GATT/WTO has a focused agenda but few tools at its disposal, while the IMF can and sometimes does make trade liberalization one of the conditions for its loan packages. The conditions of the Marshall plan provided the OEEC, predecessor to the OECD, with a powerful incentive for trade liberalization, though the OECD is now an organization with broad interests and few carrots. Quantifying the relative importance of these three organizations is thus an empirical matter.

2: Empirical Strategy

To estimate the effects of international institutions on trade, one needs a model to take account of other trade determinants. I take advantage of the widely used “gravity” model of international trade, which models bilateral trade as a function of the characteristics of the countries in question. The gravity model has a long track record of success in that it provides economically and statistically significant effects while explaining most variation in trade; see e.g., Frankel (1997).

The exact specification of the gravity model used below is:

$$\begin{aligned} \ln(X_{ijt}) = & \beta_0 + \beta_1 \ln D_{ij} + \beta_2 \ln(Y_i Y_j)_t + \beta_3 \ln(Y_i Y_j / \text{Pop}_i \text{Pop}_j)_t + \beta_4 \text{Lang}_{ij} + \beta_5 \text{Cont}_{ij} \\ & + \beta_6 \text{Land}_{ij} + \beta_7 \text{Island}_{ij} + \beta_8 \ln(\text{Area}_i \text{Area}_j) + \beta_9 \text{ComCol}_{ij} + \beta_{10} \text{CurCol}_{ijt} \\ & + \beta_{11} \text{Colony}_{ij} + \beta_{12} \text{ComNat}_{ij} + \beta_{13} \text{CU}_{ijt} + \beta_{14} \text{FTA}_{ijt} + \beta_{15} \text{GSP}_{ijt} + \sum_t \delta_t T_t \end{aligned}$$

$$+ \phi_1 \text{WTO2}_{ijt} + \phi_2 \text{WTO1}_{ijt} + \gamma_1 \text{IMF2}_{ijt} + \gamma_2 \text{IMF1}_{ijt} + \phi_1 \text{OECD2}_{ijt} + \phi_2 \text{OECD1}_{ijt} + \varepsilon_{ijt}$$

where i and j denotes trading partners, t denotes time, and the variables are defined as:

- X_{ijt} denotes the average value of real bilateral trade between countries i and j at time t ,
- Y is real GDP,
- Pop is population,
- D is the distance between i and j ,
- Lang is a binary “dummy” variable which is unity if i and j have a common language and zero otherwise,
- Cont is a binary variable which is unity if i and j share a land border,
- Landl is the number of landlocked countries in the country-pair (0, 1, or 2),
- Island is the number of island nations in the pair (0, 1, or 2),
- Area is the area of the country (in square kilometers),
- ComCol is a binary variable which is unity if i and j were ever colonies after 1945 with the same colonizer,
- CurCol is a binary variable which is unity if i and j are colonies at time t ,
- Colony is a binary variable which is unity if i ever colonized j or *vice versa*,
- ComNat is a binary variable which is unity if i and j remained part of the same nation during the sample (e.g., France and Guadeloupe),
- CU is a binary variable which is unity if i and j use the same currency at time t ,
- FTA is a binary variable which is unity if i and j both belong to the same regional trade agreement,
- GSP is a binary variable which is unity if i extended a GSP concession to j at t or vice versa,
- $\{T_t\}$ is a comprehensive set of time “fixed effects”,
- β and δ are vectors of nuisance coefficients,
- WTO2_{ijt} is a binary variable which is unity if both i and j are GATT/WTO members at t ,
- WTO1_{ijt} is a binary variable which is unity if either i or j is a GATT/WTO member at t ,
- IMF2_{ijt} is a binary variable which is unity if both i and j are IMF members at t ,
- IMF1_{ijt} is a binary variable which is unity if either i or j is an IMF member at t ,

- $OECD2_{ijt}$ is a binary variable which is unity if both i and j are OECD members at t ,
- $OECD1_{ijt}$ is a binary variable which is unity if either i or j is an OECD member at t ,
- ε_{ij} represents the omitted other influences on bilateral trade, assumed to be well behaved.

The trade data for the regressand comes from the “Direction of Trade” (DoT) CD-ROM data set developed by the International Monetary Fund (IMF). It covers bilateral merchandise trade between 178 IMF trading entities between 1948 and 1999 (with gaps); a list of the countries is included in appendix Table A1. (Not all the trading entities are “countries” in the traditional sense of the word; I use the word simply for convenience.) I include all countries for which the Fund provides data, so that almost all global trade is covered.¹¹ The only omissions of any importance are Taiwan, and some centrally planned economies.

Bilateral trade on FOB exports and CIF imports is tabulated in DOT in nominal American dollars; I deflate trade by the American CPI for all urban consumers (1982-1984=100; taken from www.freelunch.com). An average value of bilateral trade between a pair of countries is created by averaging all of the (four possible) measures potentially available (exports from i to j , imports into j from i , and so forth).

Population and real GDP data (in constant American dollars) have been obtained from standard sources: the Penn World Table, the World Bank’s *World Development Indicators*, and the IMF’s *International Financial Statistics*.¹² I exploit the CIA’s *World Factbook* for a number of country-specific variables.¹³ These include: latitude and longitude, land area, landlocked and island status, physically contiguous neighbors, language, colonizers, and dates of independence. I use these to create great-circle distance and the other controls. I add information on whether the pair of countries was involved in a currency union, using Glick-Rose (2002).¹⁴ I obtain data from the World Trade Organization to create an indicator of regional trade agreements, and include: ASEAN, EEC/EC/EU; US-Israel FTA; NAFTA; CARICOM; PATCRA; ANZCERTA;

CACM, SPARTECA, and Mercosur.¹⁵ I initially assume that all RTAs have the same effect on trade, but relax this assumption below.

Descriptive statistics are available in Table A2. Table A3 tabulates membership of the sample in the IMF, OECD, and GATT/WTO, while Table A4 presents simple correlations between the various memberships. The only notable feature of the data set is that only 1% of the sample consists of trade between IMF outsiders (more on this below).

The parameters of interest to me are ϕ_1 , ϕ_2 , γ_1 , γ_2 , ϕ_1 , and ϕ_2 . The first coefficient measures the effect on international trade if both countries are GATT/WTO members. The second coefficient measures the trade effect if one country is a member and the other is not. Similarly, γ_1 and γ_2 are analogues for the IMF, and ϕ_1 and ϕ_2 for the OECD. If trade is *created* when both countries are in the institutions, the first coefficients should be positive; if trade is *diverted* from non-members, then the second may be negative.

As my benchmark, I estimate the gravity model using ordinary least squares, computing standard errors that are robust to clustering by country-pairs. I also include a comprehensive set of year-specific “fixed” effects to account for such factors as the value of the dollar, the global business cycle, the extent of globalization, oil shocks, and so forth.

The parameters of interest are estimated using two sources of variation. The first is cross-country variation: while some countries are (say) in the GATT/WTO, others are outside the system. Comparing the two sets of observations provides an estimate of the effect of the GATT/WTO on trade. The second source of variation is time-series variation, since some countries that began the sample outside the GATT/WTO joined in mid-sample. In this case, comparing trade before and after accession provides an estimate of the GATT/WTO effect. When the data are pooled, both sources of variation are used. Restricting the estimation to a

cross-section employs only cross-country variation, while adding a comprehensive set of country-pair specific “fixed effects” delivers the “within” estimator which uses only time-series variation. As my default below, I pool the data; but I use both other estimators to check the sensitivity of my results.

3: Results

Benchmark estimation results are contained in Table 1 in the column on the left. The bottom part shows that the underlying gravity model works well. Distance (in the geographic, linguistic, monetary, and historical senses) reduces trade, while greater economic “mass” (real GDP and/or GDP per capita) expands it. The effects are economically and statistically significant; for instance, distance reduces trade with an elasticity of -1.1 and an estimated absolute t-statistic of 49. The model also explains a high proportion (65%) of the variation in the mostly cross-sectional panel data. All this inspires confidence in the basic empirical framework.

The coefficients of interest concern the effects of membership in international organizations; what do they reveal? There are two surprises; one negative and one positive. The negative surprise is that membership in neither the GATT/WTO nor the IMF is associated with deeper trade. Indeed, the point estimates for all four coefficients (both or one of the countries being in the GATT/WTO or IMF) are negative. Since it is hard to believe that membership in these organizations actually lowered trade, I do not interpret the point estimates literally. But there is little evidence that either the IMF or the GATT/WTO has exerted a strong positive effect on trade.

The other surprise is the effect of OECD membership on trade that appears to be strong and positive. Since the point estimate is .44 (with a t-statistic exceeding 5), the effect of joint

OECD membership on trade is estimated at $(\exp(.44)-1 \approx) 55\%$. Trade between one OECD member and a non-member is estimated to be $(\exp(.40)-1 \approx) 49\%$ higher.

OLS estimation is potentially affected by simultaneity bias since membership in international organizations may be driven in part by trade. In particular, countries may join the GATT/WTO in order to spur trade; this would, in principle, lead to an *upward* bias in ϕ_1 and ϕ_2 . On the other hand, the OECD's accession procedures may lead countries to liberalizing before they are allowed to join the OECD; this might be expected to lead to a *downward* bias in ϕ_1 and ϕ_2 . In practice, these potential biases do not explain the key results since ϕ_1 and ϕ_2 tend to be small, while ϕ_1 and ϕ_2 tend to be large.¹⁶

The other two columns of Table 1 report results from two different estimators that exploit the panel nature of the data set. The fixed effects “within” estimator includes a comprehensive set of country-pair specific intercepts, while the random effects estimator treats the latter as random. Both estimators raise the effects of IMF and GATT/WTO membership, though they remain negative for the Fund and moderate for the GATT/WTO. The panel estimators also raise the point estimates for OECD membership, sometimes substantially.

One other result is worthy of note: the estimated effect of regional trade agreements such as NAFTA, Mercosur, and the EEC/EC/EU. The benchmark estimate in the left column implies that belonging to a regional trade agreement raises bilateral trade by $(\exp(1.17)-1 \approx) 222\%$, and a large positive effect is also found with both panel estimators.

I have tested the sensitivity of these results extensively. Table 2 presents over twenty alternative estimates of the key coefficients, as well as the coefficient on regional trade arrangements. (Table A4 is a partial analogue for the fixed effects estimator.) The first three rows tabulate the coefficients when the three institutions are added one by one to the gravity

model instead of jointly. The fourth row allows for separate coefficients for each of the ten regional trade associations (instead of a single common effect). The next two rows split the sample by time, the following three cut the sample by income class, and then five different regions are excluded in turn.¹⁷ The following five rows contain cross-sectional evidence taken at decadal intervals. The year effects are dropped, and then a comprehensive set of country effects (to be distinguished from country-pair effects) are added. The next row shows the effect of weighting the least squares estimates by (the log product of the country-pairs') real GDP. The last two rows tabulate coefficient estimates for dynamic models. The Prais-Winsten model includes an autoregressive error (the residual autocorrelation coefficient is reported in the left column), while the next row uses the Arellano-Bond estimator to include a lag of the dependent variable in the model. Finally, the last row uses as instrumental variables for membership, the product, sum and maximum of the country-pairs' values for: democracy, polity, freedom, political rights, and civil rights.¹⁸ While these variables are plausibly exogenous, they are poorly correlated with membership so that the IV results fit poorly (although joint OECD membership continues to exert a strong positive effect on trade).

The key results seem quite robust. In particular, the effects of membership in the GATT/WTO and IMF remain small (the latter are usually negative), while the OECD and regional trade associations seem to exert strong positive effects on trade. When country effects are added, the effect of the GATT/WTO becomes economically and statistically significant. All estimates are somewhat higher when the within estimator is used (in Table A4). Generally speaking though, OECD and regional trade association membership exert much stronger effects on trade than GATT/WTO and especially IMF membership.¹⁹

Is it really possible that the OECD has a strong positive effect on trade? While the Marshall plan certainly affected the OEEC in the 1940s and 1950s, does its influence persist years later? A little light can be shed on this issue via an event study. Figure 1 shows the trade effects of OECD accession on the twelve countries that joined between 1950 and 1998, using the ratio of exports plus imports to GDP taken from the Penn World Table 6.²⁰ I show the raw data beginning five years before accession and ending two years afterwards.²¹ I also present the residual of openness from regressions on the logs of population and real GDP per capita, simply and with year and country effects. All four graphs show at least a tendency for trade to grow more quickly after accession; results before accession are less clear. Still, the small number of OECD accessions means that this evidence should not be over-interpreted.

By way of contrast, Figure 2 (taken from Rose, 2002), is an analogous event study for GATT/WTO accession, and shows much more negative results. The same is true of entry into the IMF; this is portrayed in Figure 3 for the 42 countries which acceded to the IMF during the period and have data available beginning five years before accession. The implementation of IMF programs (rather than simply IMF accession) produces similar results, which are portrayed in Figure 4. The latter studies the decade around the implementation of the 829 programs spread across 139 countries for which we have openness data.²² That is, there is little evidence from the aggregate data that trade has been stimulated by accession to the GATT/WTO or the IMF, and IMF programs also do not seem to lead to higher trade.

4: Conclusion

In this paper I have compared the effects of three international institutions in promoting trade: the GATT/WTO, the IMF, and the OECD. One might imagine that the GATT/WTO

would have the most effect, since it is the institution most dedicated to trade liberalization.

Alternatively, one might imagine that the power of the IMF to make its loans conditional upon liberalization might spur trade. In practice however, the effects of both IMF and GATT/WTO membership on trade are usually quite small (indeed, they are often negative). The OECD, on the other hand, has a robustly positive effect on trade that is both economically and statistically significant.

The GATT operated with a large number of exemptions, escape clauses, and opt-outs for developed and especially developing countries. Both the IMF and the OECD have a wide range of interests. And although the OEEC (predecessor to the OECD) had a strong incentive to liberalize in the form of conditional Marshall plan aid, neither the OECD nor the GATT/WTO currently has a lever comparable to the Fund's "big stick" of lending with conditionality to encourage trade liberalization. It would be unsurprising if none of the institutions I examine had an easily quantifiable effect on trade. The curious result I find is that membership in the OECD is consistently associated with a strong positive effect on trade, while comparable evidence is lacking for the GATT/WTO and the IMF. Since the result is robust, I think of this as an interesting mystery, and a good place to pass the baton to future researchers.

Table 1: Benchmark Results

| | Default OLS | Fixed Effects | Random Effects |
|-------------------------------------|------------------------|--------------------------|---------------------------|
| Both in GATT/WTO | -.12 (.05) | .27 (.02) | .23 (.02) |
| One in GATT/WTO | -.11 (.05) | .16 (.02) | .11 (.02) |
| Both in IMF | -.54 (.10) | -.54 (.04) | -.47 (.04) |
| One in IMF | -.30 (.09) | -.30 (.04) | -.25 (.04) |
| Both in OECD | .44 (.08) | .91 (.04) | 1.20 (.03) |
| One in OECD | .40 (.04) | .29 (.02) | .48 (.02) |
| Regional FTA | 1.17 (.11) | .78 (.04) | .91 (.04) |
| GSP | .66 (.03) | .18 (.01) | .28 (.01) |
| Log Distance | -1.10 (.02) | | -1.28 (.03) |
| Log product Real GDP | .91 (.01) | .45 (.02) | .86 (.01) |
| Log product Real GDP p/c | .27 (.02) | .21 (.02) | -.03 (.01) |
| Currency Union | 1.08 (.12) | .58 (.05) | .54 (.05) |
| Common Language | .36 (.04) | | .27 (.05) |
| Land Border | .58 (.11) | | .73 (.13) |
| Number Landlocked | -.34 (.03) | | -.57 (.03) |
| Number Islands | .05 (.04) | | .14 (.04) |
| Log product Land Area | -.10 (.01) | | -.07 (.01) |
| Common Colonizer | .66 (.07) | | .32 (.06) |
| Currently Colonized | .88 (.23) | .08 (.09) | .05 (.09) |
| Ever Colony | 1.07 (.12) | | 1.90 (.17) |
| Common Country | .16 (1.04) | | 1.48 (1.33) |
| GATT/WTO=0 | .07 | .00 | .00 |
| IMF=0 | .00 | .00 | .00 |
| OECD=0 | .00 | .00 | .00 |
| Observations | 234,597 | 234,597 | 234,597 |
| R² | .65 | .53 | .62 |

Regressand: log real trade.

OLS with year effects (intercepts not reported).

Robust standard errors (clustering by country-pairs) in parentheses.

Table 2: Sensitivity Analysis

| | -----Coefficients----- | | | | | | |
|--|-------------------------------|--------------------------|---------------------|--------------------|----------------------|-----------------|-------------------------|
| | Both GATT /WTO | One GATT /WTO | Both IMF | One IMF | Both OECD | One OECD | Regional FTA |
| Only GATT/WTO Membership | -.04 (.05) | -.06 (.05) | | | | | 1.20 (.11) |
| Only IMF Membership | | | -.59 (.10) | -.36 (.09) | | | 1.21 (.11) |
| Only OECD Membership | | | | | .40 (.08) | .38 (.04) | 1.17 (.11) |
| Dis-Aggregated Regional FTAs | -.11 (.05) | -.11 (.05) | -.56 (.10) | -.31 (.09) | .58 (.08) | .40 (.04) | |
| Pre-1980 | -.07 (.06) | -.04 (.05) | -.38 (.10) | -.20 (.09) | .50 (.08) | .41 (.04) | 1.23 (.15) |
| Post-1970 | -.23 (.07) | -.19 (.07) | -.78 (.22) | -.57 (.22) | .71 (.09) | .47 (.04) | 1.02 (.12) |
| No Industrial Countries | -.17 (.07) | -.17 (.06) | -.89 (.16) | -.57 (.16) | .40 (.24) | .19 (.06) | 1.50 (.15) |
| No Low-Income Countries | .14 (.07) | .09 (.06) | -.41 (.11) | -.24 (.11) | .36 (.08) | .35 (.05) | 1.16 (.12) |
| No High-Income Countries | .02 (.07) | -.05 (.06) | -1.09 (.17) | -.67 (.17) | .18 (.23) | -.39 (.07) | 1.71 (.14) |
| No SS-Africa | -.08 (.06) | -.05 (.06) | -.50 (.11) | -.27 (.10) | .37 (.08) | .32 (.04) | 1.20 (.11) |
| No Latin America & Caribbean | -.22 (.07) | -.23 (.06) | -.43 (.12) | -.27 (.11) | .51 (.09) | .27 (.05) | .67 (.13) |
| No South Asia | -.11 (.06) | -.10 (.05) | -.53 (.10) | -.30 (.10) | .41 (.08) | .41 (.04) | 1.20 (.11) |
| No East Asia | -.12 (.06) | -.10 (.06) | -.50 (.11) | -.27 (.10) | .60 (.08) | .51 (.04) | 1.06 (.12) |
| No Middle East & North Africa | -.20 (.07) | -.20 (.06) | -.52 (.11) | -.31 (.10) | .41 (.08) | .39 (.04) | 1.11 (.11) |
| 1955 | .66 (.13) | .30 (.10) | -.12 (.15) | -.08 (.14) | .08 (.16) | .41 (.09) | |
| 1965 | .06 (.08) | .02 (.07) | -.32 (.18) | -.20 (.18) | .75 (.12) | .51 (.07) | 1.37 (.19) |
| 1975 | -.52 (.11) | -.28 (.11) | -1.04 (.41) | -.63 (.41) | .98 (.13) | .47 (.08) | .78 (.23) |
| 1985 | -.02 (.16) | .04 (.16) | -.88 (.51) | -1.07 (.51) | .74 (.14) | .56 (.09) | 1.01 (.19) |
| 1995 | -.61 (.20) | -.76 (.21) | | | .38 (.12) | .49 (.07) | .93 (.14) |
| Without Year Effects | -.52 (.06) | -.35 (.05) | -1.51 (.10) | -.61 (.09) | 1.18 (.07) | .94 (.04) | .87 (.11) |
| With Country Effects | .29 (.05) | .11 (.04) | -.75 (.09) | -.43 (.09) | .21 (.09) | .41 (.04) | 1.03 (.12) |
| Weighted by Real GDP | -.10 (.05) | -.10 (.05) | -.53 (.10) | -.30 (.09) | .43 (.08) | .40 (.04) | 1.11 (.11) |
| Prais-Winsten (r=.83) | -.04 (.04) | -.07 (.03) | -.25 (.04) | -.11 (.04) | 1.36 (.06) | .90 (.03) | .72 (.06) |
| Arellano-Bond (lag=.35) | .11 (.04) | .02 (.04) | -.07 (.10) | -.04 (.10) | .75 (.09) | .35 (.04) | .19 (.10) |
| Instrumental Variables | -.13 (.47) | .28 (.58) | -.66 (.44) | -.69 (.45) | 1.94 (.35) | -.06 (.24) | -.13 (.26) |

Regressand: log real trade. OLS with robust standard errors (clustering by country-pairs), except where noted.
 Regressors not recorded: currency union; log distance; log exporter real GDP; log exporter real GDP p/c; log importer real GDP; log importer real GDP p/c; common language; land border; number landlocked; number islands; log product land area; common colonizer; currently colonized; ever colony; common country; and year effects.
 Arellano-Bond uses data from 1960 and does not include year effects.

PWT6 data, 1950-98. Mean, with +/- 2 standard deviations.
 Regressions include logs real GDP and real GDP p/c.

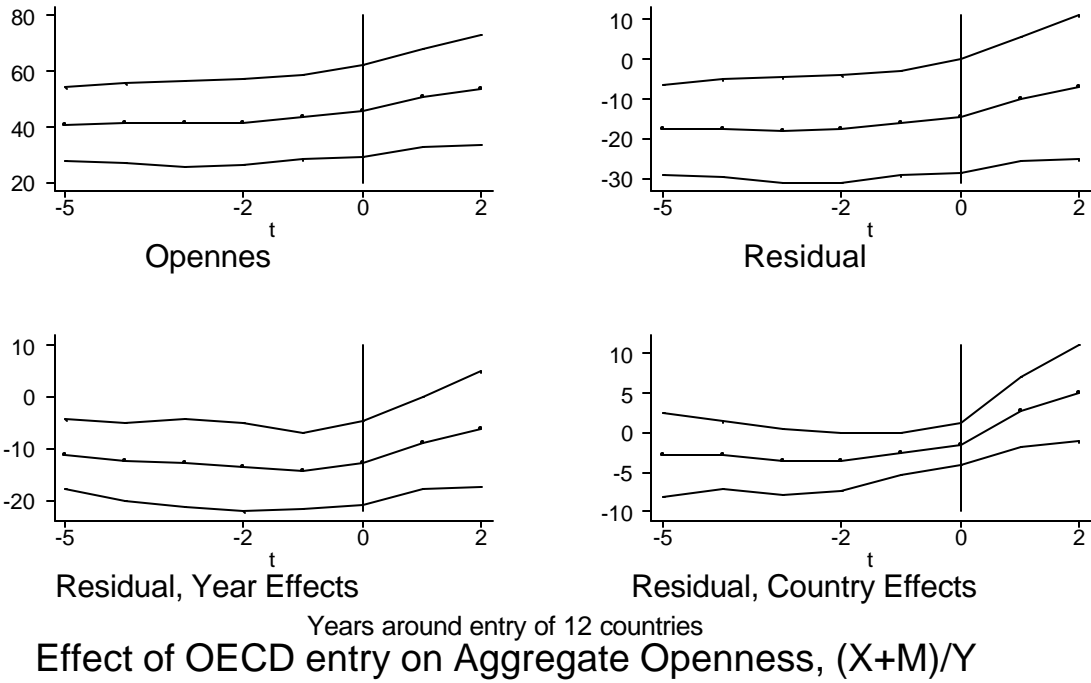


Figure 1: Event Study for Effect of OECD entry on Openness, $(X+M)/Y$.

PWT6 data, 1950-98. Mean, with +/- 2 standard
 Regressions include logs of real GDP and

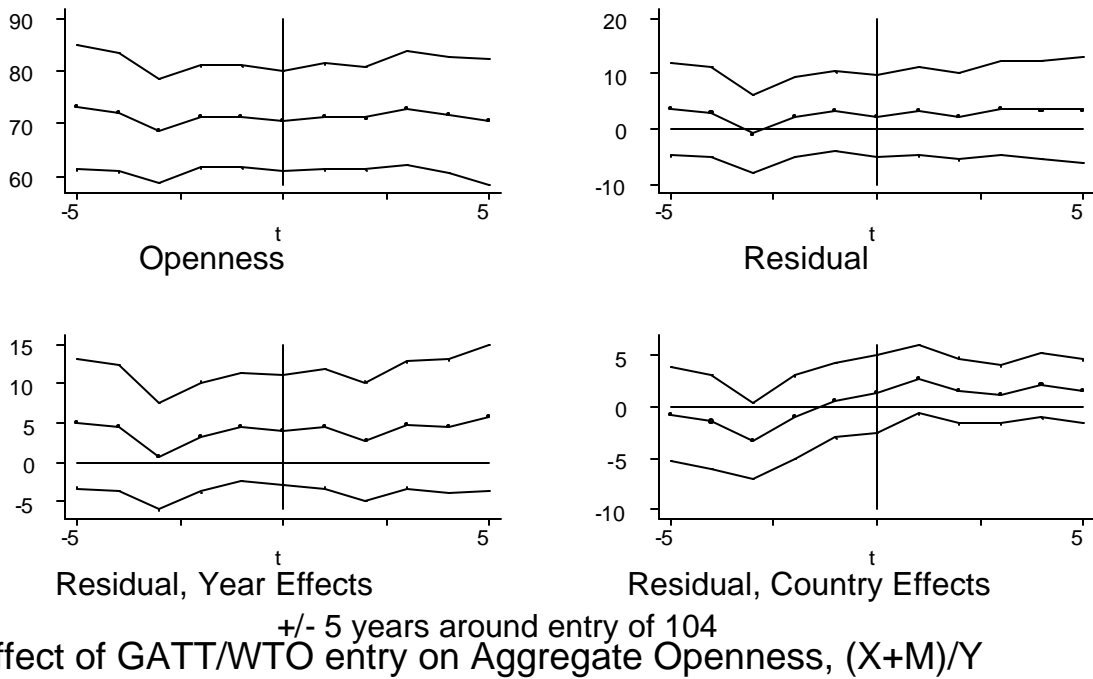


Figure 2: Event Study for Effect of GATT/WTO entry on Openness, $(X+M)/Y$.

PWT6 data, 1950-98. Mean, with +/- 2 standard deviations.
 Regressions include logs real GDP and real GDP p/c.

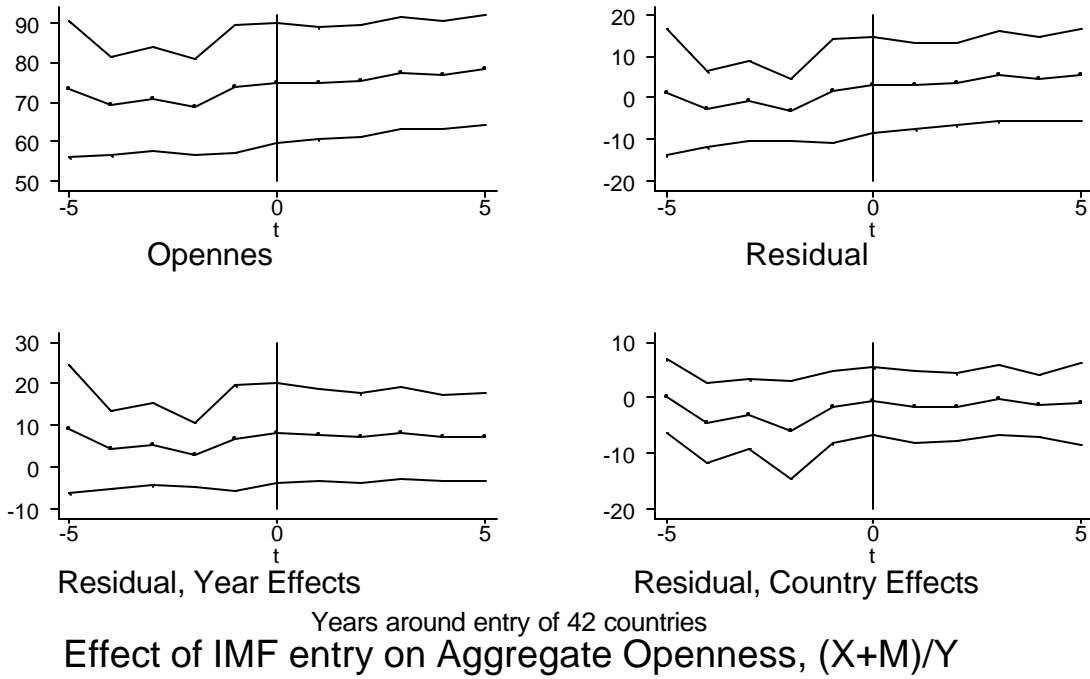


Figure 3: Event Study for Effect of IMF entry on Openness, (X+M)/Y.

PWT6 data, 1950-98. Mean, with +/- 2 standard deviations.
 Regressions include logs real GDP, GDP p/c. Scales, samples vary.

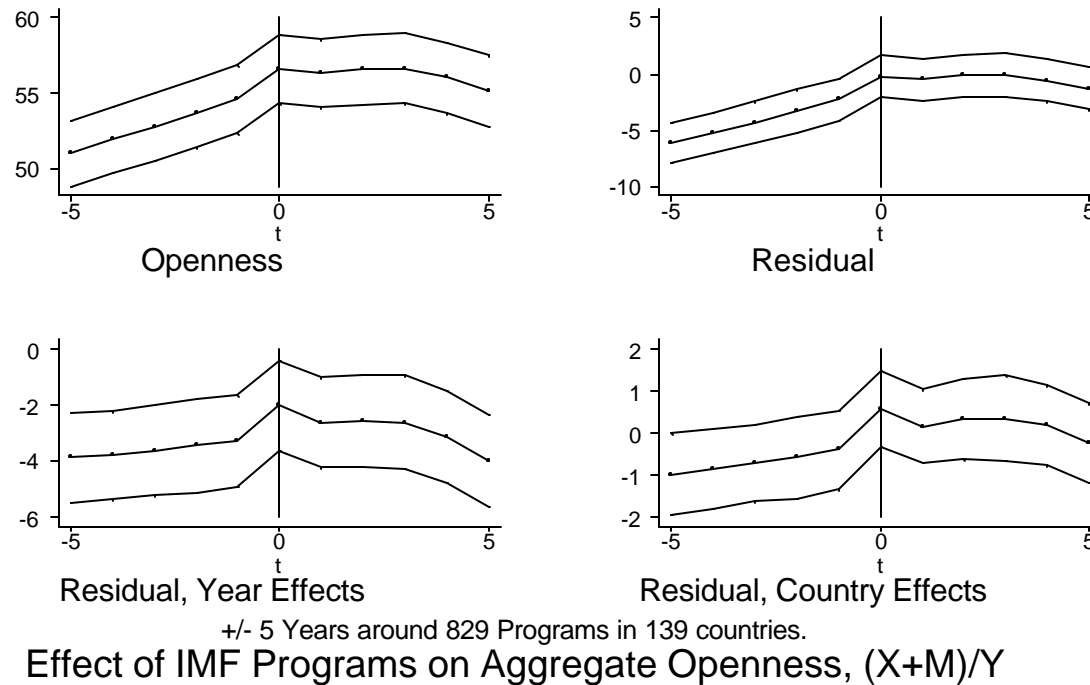


Figure 4: Event Study for Effect of IMF programs on Openness, (X+M)/Y.

Table A1: Countries Included

| | | |
|-----------------------------|------------------------|------------------------------------|
| Albania | Ghana | Panama |
| Algeria | Greece | Papua N. Guinea |
| Angola | Grenada | Paraguay |
| Antigua and Barbuda | Guatemala | Peru |
| Argentina | Guinea | Philippines |
| Armenia | Guinea-Bissau | Poland |
| Australia | Guyana | Portugal |
| Austria | Haiti | Qatar |
| Azerbaijan | Honduras | Reunion |
| Bahamas | Hong Kong | Romania |
| Bahrain | Hungary | Russia |
| Bangladesh | Iceland | Rwanda |
| Barbados | India | Samoa |
| Belarus | Indonesia | Sao Tome & Principe |
| Belgium | Iran | Saudi Arabia |
| Belize | Iraq | Senegal |
| Benin | Ireland | Seychelles |
| Bermuda | Israel | Sierra Leone |
| Bhutan | Italy | Singapore |
| Bolivia | Jamaica | Slovak Republic |
| Botswana | Japan | Slovenia |
| Brazil | Jordan | Solomon Islands |
| Bulgaria | Kazakhstan | Somalia |
| Burkina Faso | Kenya | South Africa |
| Burma(Myanmar) | Kiribati | Spain |
| Burundi | Korea, South (R) | Sri Lanka |
| Cambodia | Kuwait | St. Kitts & Nevis |
| Cameroon | Kyrgyz Republic | St. Lucia |
| Canada | Lao People's Dem. Rep. | St. Vincent & Gren. |
| Cape Verde | Latvia | Sudan |
| Central African Rep. | Lebanon | Suriname |
| Chad | Lesotho | Swaziland |
| Chile | Liberia | Sweden |
| China | Libya | Switzerland |
| Colombia | Lithuania | Syria |
| Comoros | Luxembourg | Tajikistan |
| Congo, Dem. Rep. of (Zaire) | Macedonia | Tanzania |
| Congo, Rep. of | Madagascar | Thailand |
| Costa Rica | Malawi | Togo |
| Cote D'Ivoire (Ivory Coast) | Malaysia | Tonga |
| Croatia | Maldives | Trinidad & Tobago |
| Cyprus | Mali | Tunisia |
| Czech Republic | Malta | Turkey |
| Denmark | Mauritania | Turkmenistan |
| Djibouti | Mauritius | Uganda |
| Dominica | Mexico | Ukraine |
| Dominican Rep. | Moldova | United Arab Emirates |
| Ecuador | Mongolia | United Kingdom |
| Egypt | Morocco | United States |
| El Salvador | Mozambique | Uruguay |
| Equatorial Guinea | Namibia | Uzbekistan |
| Estonia | Nepal | Vanuatu |
| Ethiopia | Netherlands | Venezuela |
| Fiji | New Zealand | Vietnam |
| Finland | Nicaragua | Yemen, Republic of |
| France | Niger | Yugoslavia, Socialist Fed. Rep. of |
| Gabon | Nigeria | Zambia |
| Gambia | Norway | Zimbabwe |
| Georgia | Oman | |
| Germany | Pakistan | |

Table A2: Descriptive Statistics

| | Mean | Standard Deviation |
|---------------------------------|-------|--------------------|
| Log Real Trade | 10.1 | 3.3 |
| GSP | .23 | .42 |
| Regional FTA | .01 | .12 |
| Log Distance | 8.2 | .81 |
| Log product Real GDP | 47.9 | 2.7 |
| Log product Real GDP p/c | 16.0 | 1.5 |
| Currency Union | .01 | .12 |
| Common Language | .22 | .42 |
| Land Border | .03 | .17 |
| Number Landlocked | .25 | .47 |
| Number Islands | .34 | .54 |
| Log product Land Area | 24.2 | 3.3 |
| Common Colonizer | .10 | .30 |
| Currently Colonized | .002 | .04 |
| Ever Colony | .02 | .14 |
| Common Country | .0003 | .02 |

234,597 observations.

Table A3: Sample Membership in International Organizations

| | Both Countries Members | One Country |
|-----------------|------------------------|-------------|
| IMF | 88% | 11% |
| OECD | 4% | 42% |
| GATT/WTO | 49% | 42% |

234,597 observations.

Table A4: Simple Correlations of Membership

| | Both OECD | One OECD | Both IMF | One IMF | Both WTO | One WTO |
|-----------------|-----------|----------|----------|---------|----------|---------|
| One OECD | -.18 | | | | | |
| Both IMF | .01 | -.02 | | | | |
| One IMF | -.01 | .02 | -.96 | | | |
| Both WTO | .18 | .12 | .22 | -.20 | | |
| One WTO | -.15 | .01 | -.11 | .13 | -.83 | |
| Regional | .20 | -.08 | .03 | -.03 | .03 | -.04 |

234,597 observations.

Table A5: Fixed Effects Sensitivity Analysis

| | Both GATT /WTO | One GATT /WTO | Both IMF | One IMF | Both OECD | One OECD | Regional FTA |
|--|-------------------------------|--------------------------|---------------------|--------------------|----------------------|-----------------|-------------------------|
| Only GATT/WTO Membership | .13 (.02) | .06 (.02) | | | | | .76 (.04) |
| Only IMF Membership | | | -.42 (.04) | -.22 (.03) | | | .74 (.04) |
| Only OECD Membership | | | | | | | |
| Dis-Aggregated Regional FTAs | .28 (.02) | .16 (.02) | -.51 (.04) | -.28 (.04) | .92 (.04) | .30 (.02) | |
| Pre-1980 | .09 (.03) | .04 (.02) | -.15 (.03) | -.06 (.03) | .78 (.04) | .26 (.02) | 1.24 (.07) |
| Post-1970 | .22 (.03) | .12 (.02) | -.78 (.08) | -.59 (.08) | .65 (.07) | .32 (.03) | .31 (.05) |
| No Industrial Countries | .27 (.03) | .14 (.02) | -.68 (.06) | -.39 (.06) | 1.02 (.31) | .25 (.05) | .82 (.08) |
| No Low-Income Countries | .16 (.02) | .01 (.02) | -.40 (.04) | -.17 (.04) | .84 (.04) | .34 (.02) | .66 (.04) |
| No High-Income Countries | .14 (.03) | .10 (.03) | -.77 (.07) | -.40 (.07) | .71 (.25) | .05 (.05) | 1.09 (.09) |
| No SS-Africa | .24 (.02) | .12 (.02) | -.45 (.04) | -.21 (.04) | .91 (.04) | .33 (.02) | .71 (.03) |
| No Latin America & Caribbean | .32 (.03) | .18 (.02) | -.42 (.04) | -.25 (.04) | .74 (.04) | .20 (.02) | .73 (.05) |
| No South Asia | .24 (.02) | .13 (.02) | -.57 (.04) | -.34 (.04) | .84 (.04) | .28 (.02) | .75 (.04) |
| No East Asia | .21 (.02) | .11 (.02) | -.50 (.04) | -.28 (.04) | .84 (.04) | .23 (.02) | .87 (.04) |
| No Middle East & North Africa | .40 (.02) | .26 (.02) | -.64 (.04) | -.38 (.04) | .87 (.04) | .25 (.02) | .76 (.04) |

Regressand: log real trade.

Regressors not recorded: currency union; log exporter real GDP; log exporter real GDP p/c; log importer real GDP; log importer real GDP p/c; currently colonized; and year effects.

“Within estimator” with pair-specific fixed effects, and robust standard errors (clustering by country-pairs) in parentheses.

Table A6: Aggregate Results

| GATT/ WTO | IMF | OECD | GDP p/c | Pop | Obs. | R² |
|----------------------|--------------|--------------|--------------------|--------------|-------------|----------------------|
| .02 (.02) | .01 (.02) | .06 (.03) | .22 (.02) | .08 (.04) | 5499 | .86 |

Regressand is log of ratio of exports plus imports to GDP.

“GDP p/c” is log real GDP per capita; “Pop” is log population.

Data from Penn World Table 6; 168 countries, 1950-1998.

OLS with robust standard errors in parentheses

Year- and country-specific intercepts included but not reported.

References

De Long, J. Bradford and Barry Eichengreen (1991) "The Marshall Plan: History's Most Successful Structural Adjustment Plan" available at www.j-bradford-delong.net.

Frankel, Jeffrey A. (1997) *Regional Trading Blocs in the World Economic System* IIE, Washington.

Krueger, Anne O. and Sarath Rajapatirana (1999) "The World Bank Policies Towards Trade and Trade Policy Reform" *World Economy* 717-740.

Rose, Andrew K. (2002) "Do We Really Know that the WTO Increases Trade?" NBER Working paper No. 9273.

Endnotes

¹ Available at <http://www.wto.org>.

² Available at <http://www.imf.org>. I do not include membership in the World Bank separately for two reasons. First, Fund membership is required for entry into the Bank, so that there is a severe multicollinearity problem. Second, it is not clear that the Bank valued international trade highly, at least for its first three decades; see Krueger and Rajapatirana (1999).

³ <http://www.imf.org/external/np/sec/mds/1996/mds9621.htm>

⁴ <http://www.imf.org/external/np/pdr/cond/2001/eng/trade/>

⁵ Available at <http://www.nber.org/books/woodstock00/structural12-15-00.pdf>

⁶ The convention is available at <http://www.oecd.org>.

⁷ Available at: <http://www.oecd.org/oecd/pages/home/displaygeneral/0,3380,EN-document-0-nodirectorate-no-21-9355-0,00.html>.

⁸

<http://webdomino1.oecd.org/horizontal/oecdacts.nsf/Display/08C611F0CF02386AC1256C850060EE3B?OpenDocument>

⁹

<http://webdomino1.oecd.org/horizontal/oecdacts.nsf/Display/B979E9A42FCAAE02C1256C8500613683?OpenDocument>

¹⁰ <http://www.oecd.org/EN/document/0,,EN-document-589-17-no-6-34464-589,00.html>

¹¹ Though I am forced to drop observations from the regression analysis if they have no usable data for e.g., output.

¹² I use the Glick-Rose data set practice (and indeed their data set through 1997); wherever possible, I use “World Development Indicators” data (taken from the World Bank’s WDI 2000 CD-ROM except for 1998-99 which is taken from WDI 2002). When the data are unavailable from the World Bank, I fill in missing observations with comparables from the Penn World Table Mark 5.6, and (when all else fails), from the IMF’s “International Financial Statistics” (converting national currency GDP figures into dollars at the current dollar exchange rate). The series have been checked and corrected for errors.

¹³ Available at <http://www.odci.gov/cia/publications/factbook/index.html>

¹⁴ Following Glick-Rose, “currency union” means essentially that money was interchangeable between the two countries at a 1:1 par for an extended period of time, so that there was no need to convert prices. The basic source for currency union data is the IMF’s *Schedule of Par Values* and issues of the IMF’s *Annual Report on Exchange Rate Arrangements and Exchange Restrictions*. I supplement this with information from annual copies of *The Statesman’s Yearbook*.

¹⁵ Available at http://www.wto.org/english/tratop_e/region_e/region_e.htm

¹⁶ Since the Fund cares more about its members than non-members, using the DoT data set raises the possibility of a sample selection problem. This seems to be unimportant in practice, since observations are typically dropped from the data set because of missing GDP data, not missing trade data. It is thus no surprise that a Heckit estimators that explicitly models the selection bias delivers results consistent with the benchmark results. Further, using a tobit estimator to account for observations where there is no trade (but the other regressors are present) does not change any key results.

¹⁷ I follow the IMF in defining industrial countries as those with IFS codes less than 200, and the World Bank 2000 *World Development Indicators* for the regional and income groups.

¹⁸ The data sources are: 1) *The Polity IV Project on Political Regime Characteristic and Transitions, 1800-1999* available at <http://www.bsos.umd.edu/ciddm/inscr/polity>, and 2) Freedom House’s Country Ratings from their *Annual Survey of Freedom 1972-73 to 1999-00*, available at <http://www.freedomhouse.org/ratings/>

¹⁹ Table A5 is an analogue using aggregate multilateral trade data from the Penn World Table 6. It shows that GATT/WTO and IMF membership have insignificant effects on the ratio of total trade to GDP, after the effects of population and real GDP per capita have been taken into account (as well as a comprehensive set of country and year intercepts). OECD membership on the other hand is associated with an economically and statistically significant increase of trade of around six percentage points of GDP.

²⁰ Australia (1971); Canada (1961); Czech Republic (1995); Finland (1969); Hungary (1996); Japan (1964); Korea (1996); Mexico (1994); New Zealand (1973); Poland (1996); Spain (1961); and United States (1961).

²¹ I stop two years after accession because a third of my sample acceded two years before the end of the PWT6.

²² For this graphic, the exact number of observations varies from cell to cell, because of missing PWT data.