Trade, Conflicts, and Political Integration: Explaining the Heterogeneity of Regional Trade Agreements

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Motivation

Usual classification from Balassa (1961): preferential arrangement, free trade agreement, customs union and common market ⇒ gradual process of integration.

No evidence of:
- a larger effect of more integrated RTAs on trade (Ghosh & Yamarik, 2002; Vicard, 2009);
- gradual processes of integration: 14 CUs on 18 created directly as such.

Why countries choose to create different kinds of RTAs?
- RTAs as process reducing tariffs but also regulation institutions
- International security issues matter.
2 channels through which regional integration is likely to promote the peaceful resolution of interstate disputes (Bearce, 2003):

- **“trade promotes peace hypothesis”:**
  - empirically, Martin, Mayer & Thoenig (RES, 2008) find an ambiguous effect of trade on peace.

- **supranational institutions:**
  - promote the exchange of information on military capabilities and resolve in conflicts ⇒ reduce asymmetries of information
  - create habits of negotiation through regular meeting of high level official ⇒ create trust and promote credible commitment
Supranational institutional frameworks differ according to the kind of RTA created.

- institutions necessary for the provision of some public goods in common (common external tariffs, competition policy)
- only RTAs implying significant institutional/political integration would deter war.

⇒ A history of conflict should enhance deep RTAs (custom unions and common markets), but not shallow.
Related literature

- **Theory:**
  - Formation of countries (Alesina & Spolaore, QJE 1997; Alesina, Spolaore & Wacziarg, AER 2000) and RTAs (Alesina et al, AER 2005) between heterogenous regions/countries;
  - RTAs with ‘non trade objectives’ (Limao, RES 2007)

- **Empirics:**
  - Economic determinants of RTA formation (Baier & Bergstrand, JIE 2004): geography, remoteness, GDP size and similarity, factor endowment
1 Theoretical framework

2 Empirical analysis I

3 Empirical analysis II

4 Conclusion

2 policy instruments endogenously determined:
- Trade policy (opportunity to form a RTA)
- Defence policy (military spending).

2 blocs embedded in a model of political integration: trade (mutually beneficial) and conflict (bargaining game).
Theoretical framework

Main assumptions:

- Forming a RTA provides gains due to the removal of political barriers to trade but entails heterogeneity costs $k_s$ ($s = E, W$).
- Neighboring countries face interstate disputes over resources or production (with probability $\rho$), which are resolved either peacefully or through war.
- The cost of war is the disruption of bilateral trade (Glick & Taylor, 2009; MMT, 2008).
Timing of the model:
- countries decide whether or not to form RTA
- they set their defense spending
- uncertainty about conflict location and escalation probabilities are revealed and conflicts are resolved.

Country $i$’s utility function:

$$U_i = Y_i - \phi_{ij} k_s + \sum_{j \neq i} E(G_{ij}) - d_i$$ (1)
Model of conflict based an a rational explanation of war, i.e. countries fight because they are unable to credibly commit to hold a deal:

- When war occurs, resources subject to conflict are distributed according to the military strength of each country (Hirschleifer, 1988), and each country pays a cost $C_{ij}$.
- When both countries bargain, resources subject to conflict are distributed according to the Nash bargaining solution, using the war outcome as disagreement point $\Rightarrow b_{ij} = \frac{d_i}{d_i + d_j}$
- I assume that the first striker has an advantage $E_{ij}$ when the opponent bargains.
⇒ Depending on $E_{ij}$ relative to $C_{ij}$, a unique coalition-proof Nash-equilibrium exists. The strategy outcome is (bargain, bargain) if $E_{ij} \leq C_{ij}$, and (fight, fight) if $E_{ij} > C_{ij}$.
⇒ probability of war: $\pi_{ij} = Pr(E_{ij} > C_{ij})$
A simple model of trade:

\[ Y_i = \varphi(1 - \tau)S_i + (1 - \tau)(1 - \varphi)S_W \]  

(2)

where \( \tau \) are transport costs and \( \varphi \) are political barriers to trade \((\varphi_{rta} = 0)\).

- National income \( Y \) increases with the number of trading partners \( S_W \) (country size equals 1).
- Gains from trade are larger with a partner inside a RTA, \( S_i = 1 + \phi_{ij} \)
- Additional gains from trade inside RTA decrease in multilateral openness.
For all $k_W < k_E$, we have in equilibrium:

- no RTA if and only if $EGRI \leq k_W$,
- one RTA on the Western continent if and only if $k_W < EGRI \leq k_E$,
- one RTA on each continent if and only if $EGRI > k_E$,

where $EGRI$ are the “expected gains from regional integration” and

$$EGRI = \frac{\rho}{4}(1 - \tau)[(\pi_{ind} - \pi_{RTA})(1 - \varphi) - \varphi\pi_{RTA}] + (1 - \tau)\varphi.$$
RTAs differentiated according to their effect on the dispute escalation to war probabilities:

\[ (\pi_{\text{ind}} - \pi_{\text{deepRTA}})(1 - \varphi) > \varphi \pi_{\text{deepRTA}} \]

and

\[ (\pi_{\text{ind}} - \pi_{\text{shallRTA}})(1 - \varphi) \leq \varphi \pi_{\text{shallRTA}} \]

**Testable implications of the model:**

1. Pairs of countries undergoing lots of interstate disputes tend to create deep RTAs, whereas country pairs having to deal with few interstate disputes create shallow RTAs.

2. Countries facing less natural transport costs are more likely to create deep than shallow RTAs.
Preliminary step: Which RTAs promote peace?

Methodology: 2 stages in the conflict process, dispute initiation and dispute escalation to war:

\[ \Pr(war_{ij}) = \Pr(dispute_{ij}) \times \Pr(escalation_{ij} | dispute_{ij}). \]

⇒ bivariate probit accounting for selection

Data

- Dispute occurrence: event data from Kinsella & Russett (2002) ⇒ conflict exceeding a certain threshold defined as ‘strong verbal hostility’ each year over the 1950-1992 period
- War occurrence: Militarized Interstate Disputes from COW (display of force, use of force and wars).
Controls for war history, distance, contiguity, bil. and multi. trade, common language and colonial history, level of democracy, defense alliance and vote correlation at the UN general assembly.

Main results

1 Membership in customs unions and common market (but not preferential and free trade agreements) reduces the probability that a dispute escalate into war.

2 Sizeable effect: same order of magnitude than an increase from the mean to the top level of democracy indexes of the two countries.
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<thead>
<tr>
<th>Dependent variable:</th>
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<th>4</th>
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<tr>
<td>MID Dispute</td>
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<td>deep RTA</td>
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<td>Sample</td>
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<td>Deep RTA membership</td>
<td>-0.59&lt;sup&gt;b&lt;/sup&gt; 0.10</td>
<td>-0.57&lt;sup&gt;b&lt;/sup&gt; -0.84&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>Nbr. of peaceful years</td>
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<td>Bil. trade dependence (t-4)</td>
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<td>0.23&lt;sup&gt;b&lt;/sup&gt; 0.23&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>Sum log area</td>
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<tr>
<td>Sum of democracy indexes</td>
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<td>Common defense alliance dum.</td>
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<td>Nbr. Of landlocked countries</td>
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<td>-0.01 0.14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.19&lt;sup&gt;a&lt;/sup&gt; 0.12&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>Deep RTAs with third countries i (t-5)</td>
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<td>0.14&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>Shallow RTAs with third countries i (t-5)</td>
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<td>0.08&lt;sup&gt;a&lt;/sup&gt; 0.04</td>
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| Observations | 127259 | 7937 | 7678 | 7678 | 7678 |
| Rho (Wald test of independent eqn.) | -0.26 | | | | |
| Time dummies | Yes | Yes | Yes | Yes | Yes |
Empirical analysis I

- Contiguous and trading countries, separated by 1000km
- Mean country pair

Predicted probability
- Deep RTA membership dum.
- 10 additional peaceful year
- Common language
- Sum democracy indexes (1 std.dev.)
- Common defence alliance dum.

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Determinants of RTA formation:

**Methodology:** Probability of RTAs between 2 countries estimated using a probit model for the year 2000.

\[ Pr(\text{RTA}_{ij} = 1) = \beta_0 + \beta_1 \rho_{ij} + \beta_2 \tau_{ij} + \beta_3 \text{Controls}_{ij} + \epsilon_{ij} \]

⇒ we expect \( \beta_1 > 0 \) for deep RTAs and \( \beta_1 < 0 \) for shallow RTAs, and \( \beta_2 < 0 \) for deep RTAs and \( \beta^\text{shallow}_2 > \beta^\text{deep}_2 \).
Data:

- natural trade openness: multilateral resistance terms estimated from gravity equation (Anderson & van Wincoop, 2003):

\[ x_{ij} = \frac{y_i y_j}{y_{ij}} t_{ij}^{1-\sigma} P_i^{\sigma-1} P_j^{\sigma-1} \]

where \( P_i^{\sigma-1} = \sum_j y_w t_{ij}^{\sigma-1} P_j^{1-\sigma} \)
Controls:

- distance, continental dummy, sum and difference of ln GDPs, difference and squared difference of ln GDP per capita, and relative difference of GDP per capita with RoW (Baier & Bergstrand, 2004);
- contiguity and common colonizer dummy, nbr of landlocked countries, sum of democracy indexes, common defense alliance dummy.

Endogeneity issue due to past RTA membership:

- Instrumental variables for dispute propensity (nbr of permanent member at the UN security council and index of religious proximity);
- MRT and GDP variables in 1960.
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<th>2 Deep</th>
<th>3 Shallow</th>
<th>4 Deep</th>
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</thead>
<tbody>
<tr>
<td>Propensity to dispute</td>
<td>-6.49(^a)</td>
<td>2.71(^b)</td>
<td>-4.49(^a)</td>
<td>7.74(^a)</td>
</tr>
<tr>
<td>Sum log MRT</td>
<td>0.47(^a)</td>
<td>-0.80(^b)</td>
<td>0.32(^b)</td>
<td>-2.73(^a)</td>
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<tr>
<td>Log distance</td>
<td>-0.35(^a)</td>
<td>-0.68(^a)</td>
<td>-0.44(^a)</td>
<td>-0.61(^a)</td>
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<td>Continent dum.</td>
<td>0.40(^a)</td>
<td>0.31</td>
<td>-0.08</td>
<td>0.26</td>
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<tr>
<td>Abs. Diff in log GDP per capita (1960)</td>
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<td>0.80(^b)</td>
<td>-0.08</td>
<td>1.44(^b)</td>
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<tr>
<td>Squared abs. diff in log GDP per capita (1960)</td>
<td>0.01</td>
<td>-0.28(^c)</td>
<td>-0.01</td>
<td>-0.34</td>
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<tr>
<td>Diff. GDP per capita with RoW</td>
<td>0.27(^a)</td>
<td>-0.25(^b)</td>
<td>0.07</td>
<td>-0.96(^a)</td>
</tr>
<tr>
<td>log sum GDP (1960)</td>
<td>1.02(^a)</td>
<td>-0.83(^a)</td>
<td>0.78(^a)</td>
<td>-3.07(^a)</td>
</tr>
<tr>
<td>log diff. GDP (1960)</td>
<td>-0.59(^a)</td>
<td>0.11</td>
<td>-0.45(^a)</td>
<td>0.77(^a)</td>
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<tr>
<td>Contiguity dum.</td>
<td>0.92(^a)</td>
<td>0.03</td>
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<tr>
<td>Common language dum.</td>
<td>0.13</td>
<td>-0.33</td>
<td>0.29(^b)</td>
<td>-0.52</td>
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<tr>
<td>Common colonizer dum.</td>
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<td>2.32(^a)</td>
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<td>2.72(^a)</td>
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<td>Nbr. of landlocked countries</td>
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<td>Sum of democracy indexes</td>
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<td>2.04(^a)</td>
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<td>1.44(^b)</td>
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<td>Common defence alliance dum.</td>
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<td>-0.51(^a)</td>
<td>0.18</td>
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<td>Total GDP of RTA partners</td>
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<td>0.15(^a)</td>
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<td>0.33(^a)</td>
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<td>Nbr. of major power</td>
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<td>0.20(^a)</td>
<td>0.20(^a)</td>
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<td>Similarity of religion</td>
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### Empirical analysis II

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<td>Common colonizer dum.</td>
<td>-0.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.32&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.66&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.72&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nbr. of landlocked countries</td>
<td>-0.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.09&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.15&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.98&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sum of democracy indexes</td>
<td>-0.37&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.39&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.44&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Common defence alliance dum.</td>
<td>-0.00&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.52&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.18&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total GDP of RTA partners</td>
<td>0.15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.33&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.33&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nbr. of major power</td>
<td>0.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.20&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Similarity of religion</td>
<td>-0.01&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.01&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;c&lt;/sup&gt;</td>
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</tbody>
</table>

Weak identification F-test on IV: 135.04 135.04 130.51 130.51
Partial R2: 0.17 0.17 0.16 0.16
Test of overidentifying restrictions: 2.28 0.50 0.02 0.14
Observations: 3403 3403 3403 3403

Vincent Vicard
Results robust to:

- Sample bias: exclusion of Western European countries, excluding bilateral RTAs, estimation on different years.
- Additional controls: diplomatic relations and bloc size.
- Modeling strategy: bivariate probit model, conditional logit with panel data.
Conclusion

- First theoretical and empirical explanation for the choice of different strategies of regional trade integration.

- Empirical results confirm:
  - the main hypothesis of the model: membership in a customs union or a common market significantly reduce war probabilities;
  - the testable implications of the model: deep RTAs are more likely to be created between countries more subject to interstate disputes and naturally more open to trade, while the opposite is true concerning shallow RTAs.
<table>
<thead>
<tr>
<th>Event category</th>
<th>Goldstein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request action; call for</td>
<td>-0.1</td>
</tr>
<tr>
<td>Explicit decline to comment</td>
<td>-0.1</td>
</tr>
<tr>
<td>Urge or suggest action or policy</td>
<td>-0.1</td>
</tr>
<tr>
<td>Comment on situation</td>
<td>-0.2</td>
</tr>
<tr>
<td>Deny an accusation</td>
<td>-0.9</td>
</tr>
<tr>
<td>Deny an attributed policy, action, role or position</td>
<td>-1.1</td>
</tr>
<tr>
<td>Grant asylum</td>
<td>-1.1</td>
</tr>
<tr>
<td>Make complaint (not formal)</td>
<td>-1.9</td>
</tr>
<tr>
<td>Cancel or postpone planned events</td>
<td>-2.2</td>
</tr>
<tr>
<td>Charge; criticize; blame; disapprove</td>
<td>-2.2</td>
</tr>
<tr>
<td>Issue formal complaint or protest</td>
<td>-2.4</td>
</tr>
<tr>
<td>Give warning</td>
<td>-3.0</td>
</tr>
<tr>
<td>Denounce; denigrate; abuse</td>
<td>-3.4</td>
</tr>
<tr>
<td>Halt negotiation</td>
<td>-3.8</td>
</tr>
<tr>
<td>Turn down proposal; reject protest, demand, threat</td>
<td>-4.0</td>
</tr>
<tr>
<td>Refuse; oppose; refuse to allow</td>
<td>-4.0</td>
</tr>
<tr>
<td>Reduce routine international activity; recall officials</td>
<td>-4.1</td>
</tr>
<tr>
<td>Detain or arrest person(s)</td>
<td>-4.4</td>
</tr>
<tr>
<td>Threat without specific negative sanction stated</td>
<td>-4.4</td>
</tr>
<tr>
<td>Issue order or command, insist, demand compliance</td>
<td>-4.9</td>
</tr>
<tr>
<td>Expel organization or group</td>
<td>-4.9</td>
</tr>
<tr>
<td>Order person or personnel out of country</td>
<td>-5.0</td>
</tr>
<tr>
<td>Nonmilitary demonstration, walk out on</td>
<td>-5.2</td>
</tr>
<tr>
<td>Reduce or cut off aid or assistance; act to punish/deprive</td>
<td>-5.6</td>
</tr>
<tr>
<td>Threat with specific negative nonmilitary sanction</td>
<td>-5.8</td>
</tr>
<tr>
<td>Ultimatum; threat with negative sanction and time limit</td>
<td>-6.9</td>
</tr>
<tr>
<td>Threat with force specified</td>
<td>-7.0</td>
</tr>
<tr>
<td>Break diplomatic relations</td>
<td>-7.0</td>
</tr>
<tr>
<td>Armed force mobilization, exercise, display; military buildup</td>
<td>-7.6</td>
</tr>
<tr>
<td>Noninjury destructive action</td>
<td>-8.3</td>
</tr>
<tr>
<td>Nonmilitary destruction/injury</td>
<td>-8.7</td>
</tr>
<tr>
<td>Seize position or possessions</td>
<td>-9.2</td>
</tr>
<tr>
<td>Military attack; clash; assault</td>
<td>-10.0</td>
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</tbody>
</table>
Table: Gravity equation with country fixed effects (1960)

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Imports</th>
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<tbody>
<tr>
<td>Log distance</td>
<td>-0.54&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Contiguity dum.</td>
<td>0.54&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Common language dum.</td>
<td>0.12</td>
</tr>
<tr>
<td>Ever in colonial relationship dum.</td>
<td>0.53&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Common colonizer dum.</td>
<td>-0.27</td>
</tr>
<tr>
<td>Colonial relationship since 1945 dum.</td>
<td>1.30&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>RTA dum.</td>
<td>0.20&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Common currency dum.</td>
<td>1.20&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>GATT membership dum.</td>
<td>0.15</td>
</tr>
<tr>
<td>Communist countries dum.</td>
<td>-1.61&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Observations</td>
<td>8467</td>
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<tr>
<td>&lt;sup&gt;R&lt;/sup&gt;&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.89</td>
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