Borders and International Terrorism

by

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Abstract
The September 11, 2001 terrorist attack to the twin towers has brought about a sharp change in the policy on international terrorism. The initial reaction has been the unleashing of a mostly unilateralist "war on terror" and hardening of national borders by the United States. Over time, other industrial economies will have incentives to stop free riding on U.S. actions and adopt similar border security. The multilateral approach to counterterrorism, while appearing a cooperative solution, will in fact emerge because "private" costs of international terrorism will progressively shift from the United States to the other members of the club. One cost of counterterrorism concerns the diversion of national output from the external to the domestic market. The decline in international trade flows, while not necessarily implying a decline in measured domestic gross domestic product, will lower welfare. In an attempt to minimize the cost of hardened borders some regional trade agreements may experiment with common security perimeters. This will lead to a deeper regional trade bias.

Key Words: borders, security, strategic interactions, trade flows, gravity model.

JEL Classifications: F13, F02, C33.

I. INTRODUCTION

The tragic events of September 11, 2001 (9/11) brought international terrorism onto U.S. soil. Terrorists struck at the symbol of U.S. capitalism and national defense and the impact on the national conscience was immense. The government reacted first by closing the borders, then by tightening security at airports and on airplanes, and then by creating a new Department of Homeland Security with a large budget. As to the "war on terror," after an initial phase of international cooperation in the war in Afghanistan, the Bush Administration adopted a unilateralist approach culminating with the doctrine of preemptive strikes and the U.S. invasion of Iraq with the "coalition of the willing".

This dramatic shift in policy was grounded in the domestic perception that the risk of global terrorism had taken a huge upward jump. Yet, the evidence suggests that the ugly phenomenon is far from new. Over the period 1968-2003 for which we have data, terrorist attacks in the world have averaged in excess of 400 a year, with a peak of 665 in 1988 and a low point of 125 in 1968; there were 355 such attacks in 2001 (Figure 1). Also, the United States have been the preferred target of international terrorists for quite some time. Figure 2 displays the number of attacks against the United States, both at home and abroad, as a fraction of total attacks. The average over the 1968-2003 period is 0.4, with a peak of 0.72 in 1971 and a low point of 0.2 in 1993; the ratio was 0.62 in 2001. Terrorists, as opposed to criminals, kill and destroy indiscriminately to achieve political goals and to advertise their agenda. The larger the number of casualties –defined as the sum of killed plus wounded individuals—the larger the

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propaganda value of the attacks. In the early years of our sample, 1968-1973, the number of casualties per attack average 1.2; over the years 1974-1993, the average more than doubled with respect to the previous period; and from 1994 to 2003 the average tripled, again with respect to the previous period (Figure 3). This evidence is consistent with the general principle that, over time, the public falls into assuefaction and that terrorists resort to more spectacular attacks to draw attention to their causes.

[Insert Figures 1 through 3 here]

The 9/11 event represents a watershed in the policy regime on international terrorism by the club of industrial democracies, which are the target of international terrorists but in particular those identified with Islamic fundamentalism.[1] The leader of this club, the United States, has been badly hurt by terrorism and is now willing to bear high costs to suppress it. This paper deals with one specific aspect of these costs, the hardening of the border. In particular, we focus on the impact that less permeable borders may have on international trade. Our point of departure is that there is a positive association between making national borders less permeable and counterterrrorism. Less permeable borders will not only slow down migration of bad human capital, the terrorists, but also migration of good human capital and trade flows. The prediction results from the impossibility of raising costs only on undesirable transactions.

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[1] There is a growing literature on the causes of Islamic fundamentalism, which are not critical for our analysis. Whatever the causes, Islamic fundamentalism considers the industrial democracies a legitimate target of indiscriminate violence.

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At the moment, the United States are the primary counterterrorist force and have hardened their borders. (Section II). Over time, other industrial economies will have incentives to stop free riding on U.S. actions and adopt similar border security (Section III). The multilateral approach to counterterrorism, while appearing a cooperative solution, will in fact emerge because "private" costs of international terrorism will progressively shift from the United States to the other members of the club. One cost of counterterrorism concerns the diversion of national output from the external to the domestic market (Section IV). Measured domestic gross domestic product may not necessarily decline but welfare will as a result of resources being redeployed to lower value use. The search for minimizing the cost of hardened borders may lead regional trade agreements to experiment with common security perimeters; this, in turn, will lead to a deeper regional trade bias.

II. THE HARDENING OF THE U.S. BORDER

Immediately following the 9/11 attack, the US government virtually shut down the border –air, sea and land. Then, policy was aimed at making the border much less permeable for "terrorists, weapons of mass destruction, illegal migrants, contraband, and other unlawful commodities" (White House 2002). The same press release states the twin objectives of the new border policy:

- "First, America's air, land, and sea borders must provide a strong defense for the American people against all external threats, most importantly international terrorists but also drugs, foreign disease, and other dangerous items.

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- Second, America's border must be highly efficient, posing little or no obstacle to legitimate trade and travel."

But there is no explicit recognition that a more secure border may imply a less open border or of the difficult tradeoffs between the two objectives. Just as importantly, the U.S. border policy shows no serious intent in cooperative arrangements on securing large border perimeters. Take the long and important border between Canada and the United States as a case in point. On December 12, 2001 Tom Ridge, then Director of the Office of Homeland Security, and John Manley, Canada's Minister of Foreign Affairs, signed a 30-point "Smart Border Declaration" to "speed and secure the flow of people and goods between the United States and Canada" (White House 2002). The declaration raised expectations that Canada and the United States, the largest trading partners in the world, would implement a common security perimeter. As an example of this optimism, Andrew Shea (2001) of the Conference Board of Canada reports that polls conducted after 9/11 indicated that a majority of Canadians would support a common security perimeter. This perimeter, furthermore, could be made a reality if both countries were to accept the principle of mutual recognition on customs inspections. Michael Hart and William Dymond (2001), two researchers at the Carleton University's Centre for Trade Policy and Law, argue that a common perimeter for Canada and the United States has been in the making for quite some time, and cite NORAD (North America Aerospace Defense Command), the Autopact, and

NAFTA as precursors of the common perimeter.[2] But the reality is that the US government has very little interest in a policy of mutual recognition. Differences in preferences and power are too wide to build on a common security perimeter that is not a mere extension of the U.S. border system (Golob 2002). On January 23, 2003, John Manley acknowledged that:

> "Whether we want it or not, and I think probably we don't, the U.S. would not be interested in that kind of measure [common North America perimeter]. I don't think they are any way near to eliminating or reducing borders."[3]

Further evidence that the U.S. border has been hardened relative to other national or regional borders comes from recent efforts by a group of U.S. universities to push the Department of Homeland Security to review border procedures. According to a survey conducted by the Council of Graduate Schools, foreign applications to U.S. colleges and universities fell 32 per cent during the last reporting period over the previous one; for Chinese graduate applications the drop was 76 per cent (*Financial Times* April 29, 2004). In contrast, foreign applications have been rising in Australia, Canada, and the United Kingdom. U.S. Secretary of State Colin Powell is reported as saying "that international scientific exchanges and conferences in the US have become almost impossible to organize because of the new restrictions…This hurts us. It is not serving our interests. And so we really do have to work on it" (*Financial Times*, April 23, 2004).

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[2] The authors fail to note that NAFTA is not a customs union and, hence, has no common commercial policy.
[3] American Hemisphere Foreign immigration news,
http://www.uwsa.com/pipermail/uwsa/2003q/035005.html

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In sum, the mostly qualitative evidence on border security can be summarized as follows. The United States has responded to 9/11 by launching a "war on terror" that is based on the principle of preemptive strikes abroad and secure borders at home. This is on the whole a unilateralist policy: the cooperation of other nations is welcome but, if not forthcoming, the Bush Administration will continue its policy without it. The tradeoff of a more secure border is a less open border, with adverse consequences on international trade and flows of human capital. In the rest of the paper, we will first analyze, in a strategic context, how the U.S. border policy will affect other national borders and then provide some quantitative evidence of the effects of border hardening on international trade.

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III. COUNTERTERRORISM, UNILATERALISM AND COOPERATION

If counterterrorism were a classic public good –i.e., non-excludable and non-rivalrous— the equilibrium outcome would be output underprovision or outright zero output. But, as we have noted, the United States have such high private benefits from counterterrorism that, for a broad range of cost estimates, they are willing to undertake unilateral actions, including preemptive strikes against sovereign states. Furthermore, U.S. counterterrorism generates large external benefits to the rest of the industrial and capitalist club. It follows that this is an ideal scenario for other club members – the Western industrial democracies-- to free ride on U.S. actions. Or, if not free riding, pay riding (Lee 1988). Under pay riding, club members undertake some cooperation with the United States but, at the same time, give something of value to terrorists. A classic example of pay riding is Saudi Arabia, an ally of the United States but the home of radical Wahabism. A second example is Spain that has pulled its troops from Iraq after the catastrophic terrorist attack of March 11, 2004 in Madrid. Honduras and the Dominican Republic have also pulled their troop contingents from Iraq after Spain. Poland, Thailand, Kazakhstan and the Philippines have indicated that their troop commitments may be revisited. Free riding and pay riding have similar outcomes in that they generate equilibrium solutions that deviate from the optimal cooperative solution. It leaves the United States in an asymmetric position of bearing the largest cost of terrorism and enforcing almost unilaterally the hardening of the border. We will call this the unilateralist solution to the war on terror and border security.

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Over time, the unilateralist solution is likely to turn into a multilateral one. There are two reasons for that. The first is that the United States will exert pressure on members of the club to tighten up their border security, stop pay riding and absorb a larger share of the "war on terror". So far, the most visible manifestation of collective action on the part of the industrial-capitalist club is in sharing security intelligence; for the rest club members still behave as independent sovereign nations. The second is that terrorists will readjust their strategy after the hardening of the U.S. border and will substitute softer targets and countries with less secure borders for harder targets and countries with more secure borders (Sandler et al. 1983). Enders and Sandler (2003) summarize the evidence on this substitution effect. For example, "metal detectors were estimated to reduce skyjackings and threats and hoaxes by 13 and 9.5 incidents per quarter, respectively. However, the number of other hostage-taking incidents and assassinations rose by almost 10 incidents per quarter" (p. 14). Also, the fortification of U.S. embassies has reduced attacks against them but has brought an increase in political assassinations (p.15). Following 9/11 and the hardening of U.S. border, terrorists have hit Indonesia, the Philippines, Saudi Arabia, Spain, and Turkey. A shift in favor of softer targets apparently has already occurred.

The effect of these two forces will raise the marginal private benefits of counterterrorism for the other members of the club. The incentives for free riding and pay riding will diminish, borders will be hardened, and counterterrorist activity will rise. It will appear as if club members had coordinated their strategies, but in fact the outcome is one of strategically interacting independent border policies. In the long run, club members will enjoy comparable

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levels of border security, although they will fall short of applying mutual recognition of visa and customs inspection.[4] We call this a multilateral scenario.

A more secure border implies a less permeable border. From a strictly economic viewpoint, borders create two separate effects. The first, called trading cost, consists of a collection of transaction costs and regime costs, such as transport, administration, differences in legal systems and practices, languages, networks, competitive policies, and monetary regimes. The second consists of tariffs or tariff-equivalent restrictions that aim at discriminating against foreign producers. While for each producer a tariff is a cost like transport, in the aggregate tariffs and tariff-equivalent restrictions redistribute income from foreign producers to domestic producers and consumers. Trading costs, unlike tariffs, absorb resources that melt away like an 'iceberg' as it travels in warm weather (Fratianni 2003). The hardening of the border makes the 'iceberg' melt faster. Transaction costs for transnational flows of goods, services, physical and human capital will rise. Some goods, capital, and people will travel less; others may stop traveling altogether. International trade will be adversely affected by terrorism and counterterrorism unless policy-driven liberalization will compensate for the higher trading costs.

One way to compensate for the adverse economic effect of a more secure border is to create a security perimeter that encompasses countries with similar preferences and standards towards the

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[4] In fact, some evidence is emerging that matters are already moving in this direction. For example, the New York Times (May 10, 2004) reports that the European Union's new counterterrorist coordinator has been trying to reassure the U.S. government that the European Union will harden its counterterrorist practices.

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fight on terrorism. In addition to obvious economies of scale, the larger perimeter would reduce

much of the trading costs associated with borders. Custom unions would be best suited for such

perimeters since they already share a common commercial policy. To make it work, participating

countries would have to accept each other's standards; trust is of the essence. The European

Union has advanced the farthest in this respect.[5] The hardening of borders would speed up

regional security perimeters and attempt to capture within the region some of the trade that is

being lost between regions. Regional trade bias would be accentuated.

IV. THE IMPACT OF A MORE SECURE BORDER ON TRADE

In this section we give some rough orders of magnitude about the impact of a more secure border

on international trade. We proceed as follows. We have argued that a more secure border implies

a less open border. Transnational flows of good, services, physical capital, and human capital are

subject to higher trading costs as a result of less permeable borders. Since the variable distance

in the gravity model of international trade is a proxy of trading costs, we use the elasticity of real

trade flows with respect to distance to measure the impact of higher security or longer distance

on trade. National borders represent a discontinuity in distance. For a given distance, two

locations separated by a national border trade less than two comparable locations inside the

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[5] In addition to accepting each other's passports, the member countries of the European have pledged to
develop a common policy on asylum and migration by 2004
(http://www.europa.eu.int/scadplus/leg/en/lvb/l33155.htm).

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same border. In the specific case of trade between Canada and the United States, McCallum (1995) estimates that the border discontinuity lowers trade by a ratio of 1 to 20 relative to transactions on either side of the border.

Our first scenario is the unilateral hardening of the border by the United States. We have characterized this scenario as prevailing in the short run. Over time, as a result of U.S. pressure and the shifting strategy by terrorists to seek targets in softer countries, other members of the club will adopt similar security measures. The second scenario is the multilateral approach of differentiated security levels, with the highest standards taking place in the club of industrial democracies, those represented by the G7 countries. The third scenario is the adoption of regional security perimeters to compensate for some of the adverse trade effects of less permeable borders.

Security as distance

The gravity model has had considerable success in explaining bilateral trade flows in terms of income, population, distance as a proxy of transaction costs, and country characteristics; see Frankel (1997) for the importance of this model in empirical international trade. A stylized representation of the gravity model is given by (1):

(1) $\ln(X_{ijt}) = \alpha_0 + \alpha_1 \ln(Y_i Y_j)_t + \alpha_2 \ln(N_i N_j)_t + \alpha_3 \ln(DIST_{ij}) +$

$+ \alpha_4 RTA_{ij} + \alpha_5 MU_{ij} + \alpha_6 FEAT_{ij} + u_{ijt},$

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where X_{ij} = real bilateral trade between country i and country j, Y = real gross domestic product (the counterpart of Newton's masses), N = population (to reflect that larger areas are less open), DIST = distance, RTA = trade between country pairs that belong to the same regional trade agreement, MU = trade between country pairs that share the same currency, FEAT = a vector of dummy variables that capture idiosyncratic country characteristics, and u_{ij} = i.i.d. error term. The vector of dummy variables in FEAT can be very large and includes year dummy variables and time-invariant factors such as common language, common colonizer, and shared land border. We have highlighted RTA and MU because there is a sizeable and growing literature on the trade bias created by regional trade agreements and currency unions; see Frankel (ch. 5) and Rose (2000) for leading examples.

Table 1 shows estimates of (1) using bilateral real trade flows from 1970 to 1999, at five-year intervals.[6] The dataset and data description are from Rose (2003) and are available on his web site at the University of California at Berkeley.[7] It should be noted that the dependent variable is a simple average of four bilateral flows: exports from i to j, imports of i from j and corresponding flows for the other trading partner. We made some changes to the data with respect to the definition of CU, regional, interregional, and individual RTA dummy variables (see Table 1). The regional dummy is equal to one when both countries belong to the same RTA;

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otherwise it is zero. Regionalism is defined in terms of eleven separate RTAs: ANDEAN, ASEAN, CARICOM, CACM, EC/EU, MERCOSUR, NAFTA, SPARTECA, USIS, PATCRA, and ANZCERTA.[8] The interregional dummy is equal to one when the two trading partners belong to different RTAs; otherwise it is zero.

[Insert Table 1 here]

Estimates from pooled analysis in Table 1 are broadly consistent with those obtained elsewhere in the literature. The OLS regression explains much of the variance of real bilateral trade flows. Trade flows respond positively to real income and negatively to population. The large and controversial positive trade bias due to monetary union is smaller than the positive bias due to regional trade agreements. The larger regional trade biases occur in ASEAN, Latin America, and the South Pacific. In the EC/EU, the bias is negative. The positive coefficient of the interregional dummy does not suggest that regionalism has created statistically significant trade-diverting effects. Altogether, the adopted specification controls for a variety of effects.

The coefficient of distance, which is of direct interest to us and proxies transaction costs, is -1.17 with an extremely low standard error of 0.014 and, thus, it is significantly different from -1. An increase in distance of one per cent lowers real bilateral trade flows by more than one per cent. If we interpret hardening of borders as an increase in trading costs and an increase in trading costs as a lengthening of distance, we can conclude that border security will have an adverse impact on trade.

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[8] Rose (2003) uses all of the list RTAS except ANDEAN. For a full description of RTAs, see Table 1.

In the unilateralist scenario, the United States are the only country to harden security: U.S. border actions translate in a uniform lengthening of distance with respect to all trading partners. The loss of U.S. trade flows will be proportional to the lengthening of distance. With a hypothetical 20 per cent uniform distance lengthening, U.S. real trade flows would decline by approximately 23 per cent. This assumes that nothing else on the right-hand side of (1) is changing.[9] The *ceteris paribus* assumption may not in fact hold for big regime shifts in border security and, in fact, is prone to the Lucas critique. One obvious adjustment resulting from the hardening of the borders comes from the substitution of trade between country pairs with lower trading costs for country pairs with higher trading costs. International trade would be diverted towards lower-barrier countries and would further penalize the United States. In fact, the 23 per cent loss estimate in real trade flows following a distance lengthening of 20 per cent has a downward bias because it ignores this substitution effect.

In the multilateralist scenario, other industrial economies eventually respond to the terrorist challenge and harden their borders. Say that border hardening is high for the G7 club and low for every one else. U.S. distance lengthening would be asymmetrical, with no distance lengthening vis-à-vis the G7 trading partners and distance lengthening vis-à-vis all the other countries. Given that real trade flows between the United States and G7 trading partners in 1999 were almost 50 per cent of total real U.S. trade flows , the multilateralist solution implies approximately one half of U.S. real trade loss of the unilateralist scenario. Substitution of trade

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[9] We are assuming that estimates from the pooled sample best describe real U.S. bilateral flows.

between country pairs with lower trading costs for country pairs with higher trading costs would further erode U.S. real trade flows, but to a lesser degree than in the unilateralist scenario.

Borders as discontinuity in distance

Another criticism of using distance to gauge the likely impact of border security on trade flows is that the border creates a discontinuity in distance, the discontinuity reflecting multilateral as well as bilateral forces. Take Anderson and van Wincoop's (2003) model that predicts that bilateral trade flows depend, among other factors, on bilateral and multilateral trading costs. When bilateral costs rise relative to multilateral costs, bilateral trade flows fall. Furthermore, the smaller the country the larger is the fraction of its output exposed to trading costs. There is very little in Luxembourg's output, for instance, that is not traded and hence not exposed to trading costs. Exactly, the opposite is true for the vast U.S. economy. When the United States harden their borders unilaterally, protection increases and output is redirected from outside to inside the border. The proportion of U.S. redirected output will be a fraction of the redirected output of smaller trading partners. Anderson and van Wincoop reestimate McCallum's gravity model both from the viewpoint of Canada and the viewpoint of the United States, whose economy is approximately ten times the size of Canada's. It turns out that the bilateral border, seen from Canada is ten times as thick as seen from the U.S. side. These estimates suggest that tightened U.S. border security will have differentiated effects on countries, with the largest impact being felt by small and developing economies.

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<u>Common security perimeters and regional trade bias</u>

Unilateralism provides the benefit of aligning policies to domestic preferences but ignores the costs due to feedback effects and negative externalities. Countries and regions that are adversely impacted by tighter border security would be looking for ways to reduce its cost. Seen from the perspective of gravity model, international trade suffers from several biases, one of which being regionalization (Table 1). U.S. unilateralism on the war on terror and border security may actually accelerate the process of regional deepening through the launch of common security perimeters. RTAs with homogeneous countries and preferences would be the fastest in implementing such a perimeter --the European Union being the obvious candidate. Custom unions would face lower coordinating costs than free trade associations. On the whole U.S. unilateralism would accentuate the regional trade bias.

V. CONCLUSIONS

The savage attack of 9/11 has altered fundamentally the attitude and policy of the leader of the industrial democracies with respect to international terrorism. Unilateralism has characterized the initial phase of this policy. It is a very costly policy both in terms of resources devoted to secure the national border and military expenditures to fight terrorism abroad and preempt attacks of so-called rogue states. It is also likely to be costly in terms of reduced transnational flows of trade, physical capital, and human capital --the focus of our paper. We predict that

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unilateralism cannot last: in addition of not being in the interest of the United States, the search for softer targets on the part of terrorists will yield ultimately a multilateral solution to terrorism, at least within the confines of the largest industrial democracies. Unlike a pure public good, counterterrorism generates large private benefits and mitigates free riding.

We have interpreted border security as an increase in trading costs, which are subsumed in the distance variable of the gravity model. Real trade flows are very distance elastic. Since there is no metric to transform border security into distance, our predictions are more qualitative than quantitative. Clearly, a multilateralist solution implies a smaller decline of real trade flows for the United States than a unilateralist solution. Also, border effects are asymmetric. Smaller and more open economies are more adversely affected by border restrictions than larger and closed economies. So whatever the impact of higher border security on U.S. real trade flows, it will be larger for other countries. Finally, border restrictions by one or a few countries will divert trade towards countries that have smaller restrictions.

The decline in international trade flows does not necessarily implying a decline in measured domestic gross domestic product, but will lower welfare. In an attempt to minimize the cost of hardened borders some regional trade agreements may experiment with common security perimeters. This will lead to a deeper regional trade bias.

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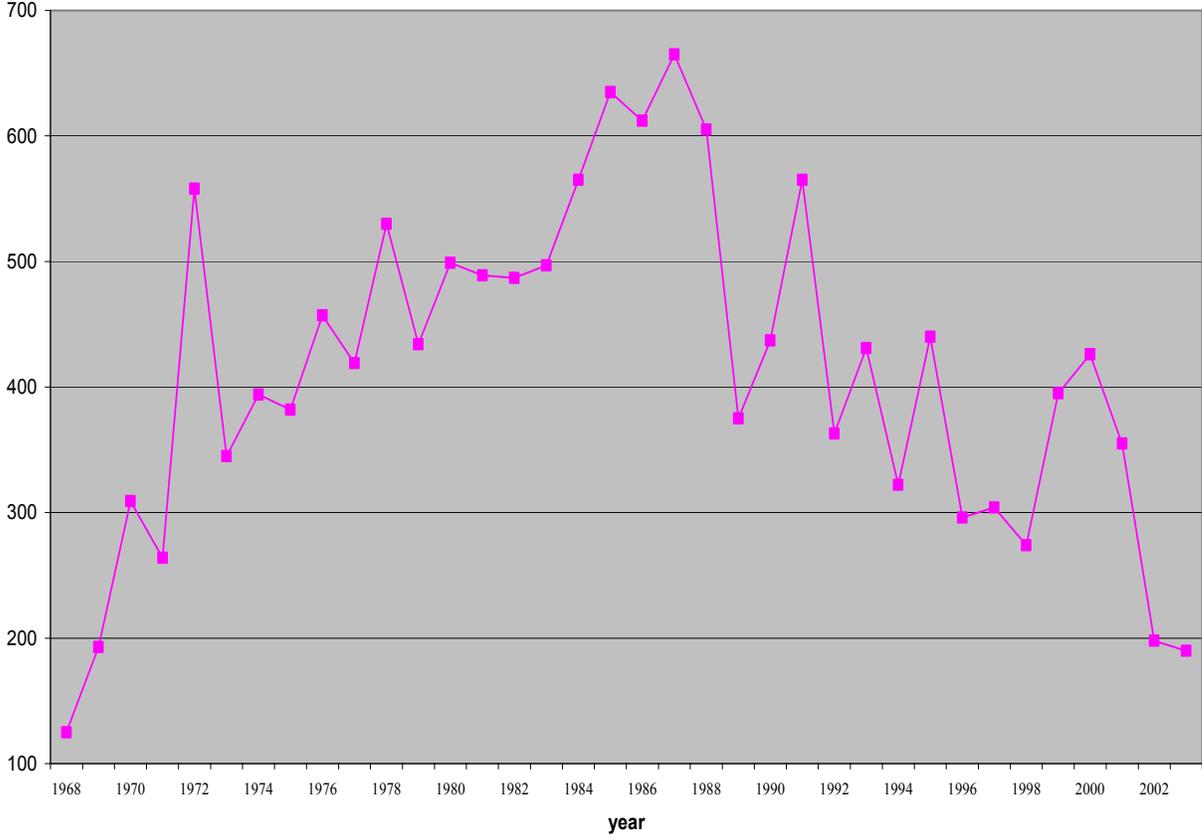802.

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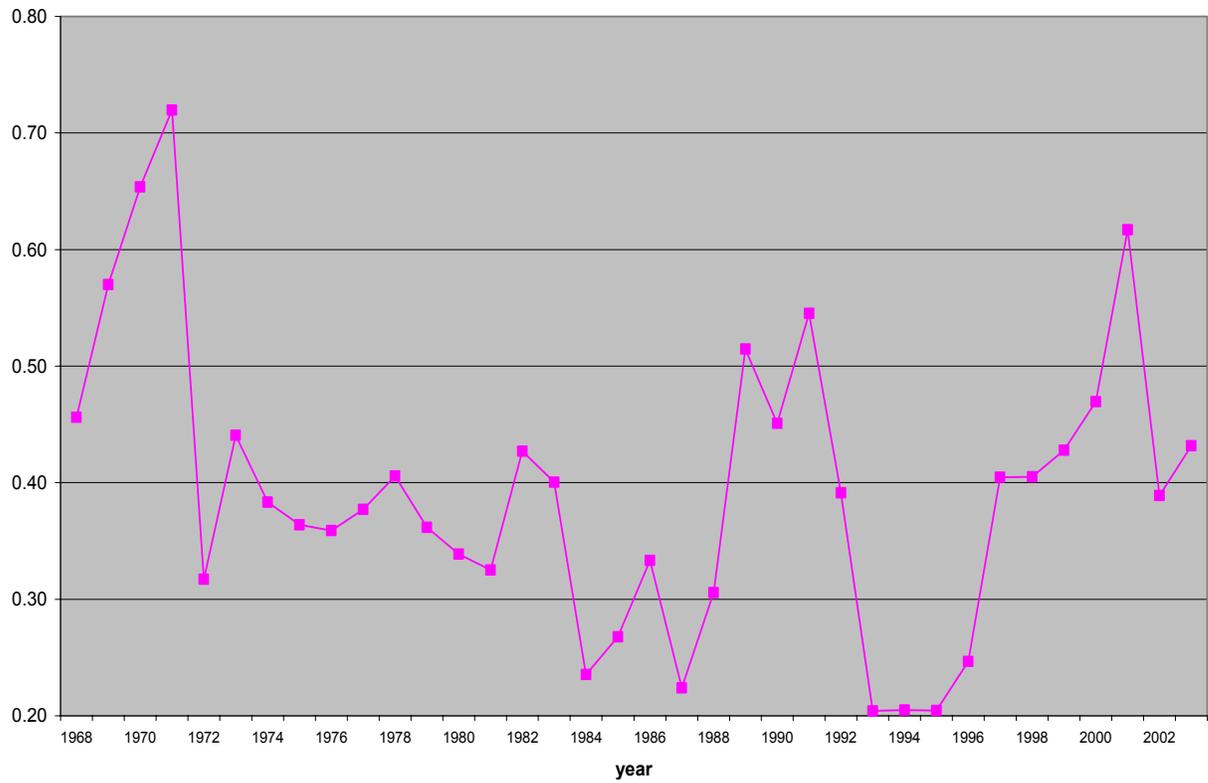
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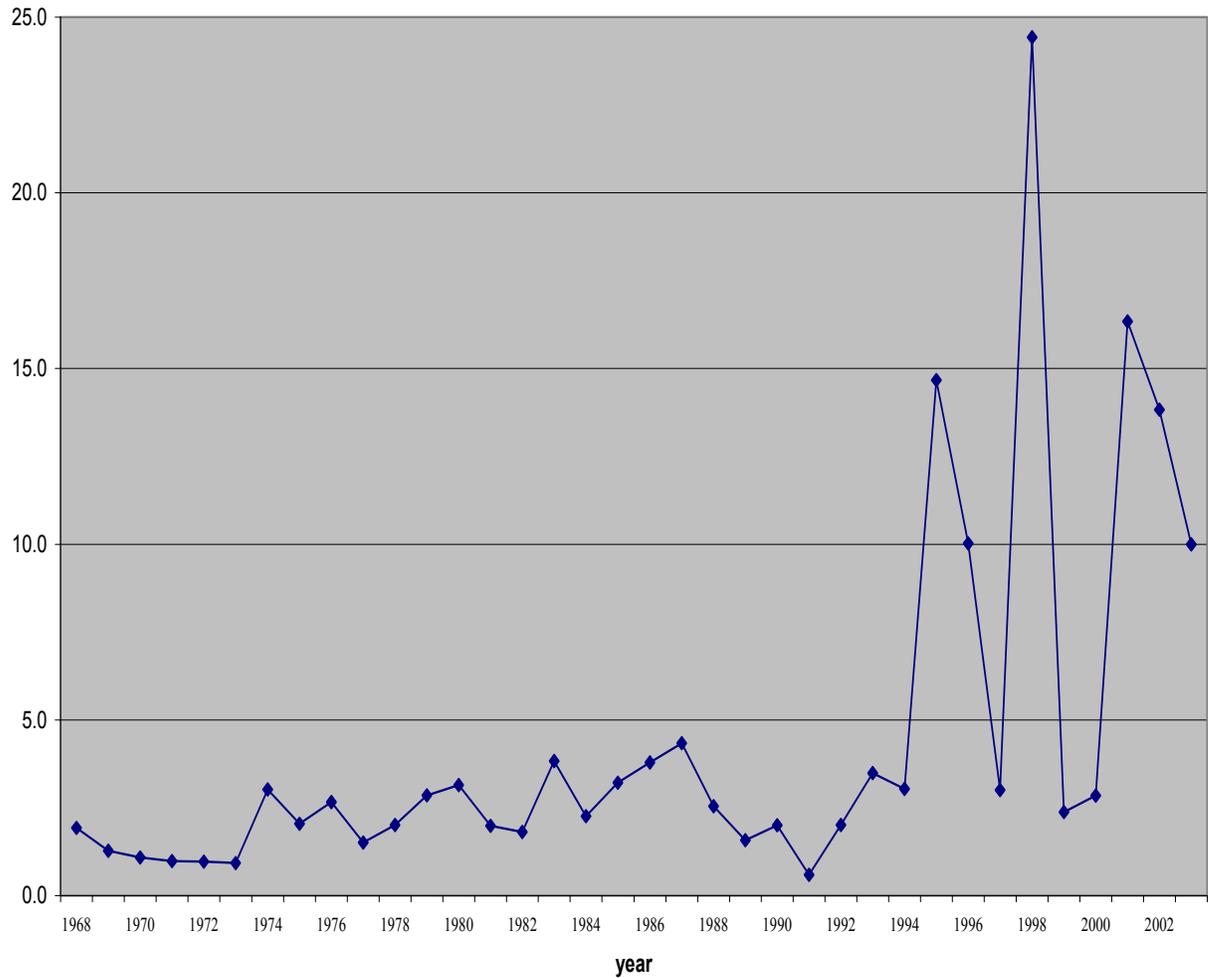**Figure 1 Number of Terrorist Attacks: 1968-2003**

Source: Sandler (2003, Table 1) and U.S. Department of State (2003, 2004).

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Figure 2: Ratio of Attacks against the US to Total Attacks

Source: Sandler (2003, Table 1) and U.S. Department of State (2003, 2004).

Figure 3: Casualties per Attack

Source: Sandler (2003, Table 1) and U.S. Department of State (2003, 2004).

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Table 1: Estimates from Gravity Model
Dependent variable is the log of real trade flows

Variables	With RTA effects		With separate RTAs	
Intercept	-29.28***	(0.214)	-30.0***	(0.218)
Log of real GDP	0.88***	(0.004)	0.89***	(0.004)
Log of real GDP per capita	0.42***	(0.007)	0.43***	(0.007)
Log of distance	-1.17***	(0.014)	-1.17***	(0.014)
Regional dummy	1.16***	(0.074)		
Interregional dummy	0.35***	(0.036)	0.30***	(0.036)
Common currency dummy	0.80***	(0.085)	0.92***	(0.085)
Common land border dummy	0.43***	(0.066)	0.48***	(0.067)
Common colonizer before 1945 dummy	0.62***	(0.038)	0.60***	(0.038)
Common country dummy	1.18*	(0.662)	1.16*	(0.659)
Colonial relationship dummy	1.58***	(0.077)	1.58***	(0.077)
Common language dummy	0.35***	(0.027)	0.32***	(0.027)
1975, 1980, 1985, 1990, 1995, and 1999 year dummies	Estimated but not reported here		Estimated but not reported here	
ASEAN dummy			1.75***	(0.222)
ANDEAN dummy			0.72*	(0.380)
CARICOM dummy			2.0***	(0.131)
CACM dummy			2.03***	(0.257)
European Community/EU dummy			-0.62***	(0.125)
MERCOSUR dummy			0.94	(0.600)
NAFTA dummy			0.13	(0.784)
SPARTECA dummy			3.10***	(0.208)
USIS dummy			1.35	(1.036)
PATCRA dummy			-0.67	(0.943)
ANZCERTA dummy			-0.92	(1.056)
Number of observations	43,745		43,745	
R^2	0.64		0.64	

The dependent variable is the average of four-way flows between country i and j divided by the U.S. price deflator. Numbers in parentheses are standard errors: * indicates statistical significance at the 10% level, ** at the 5 per cent level, and *** at the one per cent level. Estimates were obtained from OLS on pooled data compiled by Rose (2003), http://www.has.berkeley.edu/~arose/. The Rose dataset was modified with respect to the definition of CU, regional, interregional, and individual RTA dummy variables. CU countries include, for different years, those in the are of the U.S. dollar (The United States, Dominican Republic, Guatemala, Panama, Bahamas, Bermuda, and Liberia), East Caribbean dollar (Antigua & Barbuda, Dominica, Grenada, St. Vincent and the Grenadines, St. Christopher Kitts-Nevis, and St. Lucia), pound (United Kingdom, Guyana, Ireland, Malta, Cyprus, Oman, Gambia, Malawi, Mauritius,

Seychelles, Trinidad & Tobago, Kenya, Tanzania, Uganda, Somalia, Malaysia, and Singapore), the CFA (Central African Republic, Cameroon, Chad, Republic of Congo, Equatorial Guinea, Gabon, Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal, and Togo), franc area (France, Comoros, Madagascar, and Mauritania), Australian dollar (Australia, Kirabati, Solomon Islands, and Tonga), rihal (Quatar and United Arab Emirates) Indian rupee (India and Bhutan), Portuguese escudo(Portugal, Angola, Cape Verde, Guinea-Bissau, and Mozambique), euro (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spain, and Portugal), rand (South Africa, Botswana, Lesotho, Namimbia, and Swaziland), and Pakistani rupee (Pakistan and Burma).

Regionalism was defined in terms of 11 RTAs: ANDEAN (Bolivia, Colombia, Ecuador, Peru, and Venezuela), ASEAN (Philippines, Indonesia, Malaysia, Singapore, Thailand, Vietnam, Laos, Burma, and Cambodia), CARICOM (Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St.Kitts and Nevis, St.Lucia, St.Vincent and Grenadines, Suriname, and Trinidad and Tobago), CACM (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua), NAFTA (Canada, the United States, and Mexico), MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay), USIS (the United States and Israel), PATCRA (Australia and Papua New Guinea), ANZCERTA (Australia and New Zealand), SPARTECA (Australia, New Zealand, Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Vanuatu, and Samoa), and EC/EU (Belgium, France, Germany, Italy, Luxembourg, Netherlands, Denmark, Ireland, United Kingdom, Greece, Portugal, Spain, Austria, Finland, and Sweden). The regional dummy is equal to one when the countries in the pair belong to the same RTA; otherwise it is zero. The interregional dummy is equal to one when the countries in the pair belong to different RTAs; otherwise it is zero.