Do Preferential Trade Agreements Discourage Procurement Discrimination?

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As traditional "at the border" trade barriers have fallen, governments have become increasingly concerned about "behind the border" barriers such as discriminatory public procurement. Although a growing number of governments have tried to control procurement discrimination by including rules about public procurement in preferential trade agreements, we currently know nothing about the effects of such rules. This paper is the first to examine the impact of preferential procurement agreements (PPAs) on procurement discrimination. We assemble an original dataset of PPAs and examine their effects in a sample of 112 countries from 1990-2007. In an exhaustive analysis that employs different model specifications and estimation techniques, different subsamples, and different groups of preferential agreements, we find no evidence that PPAs reduce discrimination against foreign producers. We speculate that the irrelevance of PPAs stems from the opaque nature of public procurement and the consequent difficulty of identifying treaty violations. Our results thus shed light on the conditions under which governments are *not* likely to keep their international commitments.

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International treaties are commitment devices: they formally and publicly oblige members to adopt some policies and refrain from others. Even without supranational enforcement, such commitments can alter state behavior by clearly defining prescribed and proscribed actions and raising the reputational costs of noncompliance (Keohane 1984). Empirical studies show that such reputational effects have encouraged cooperation in both international trade and finance (Busch and Reinhardt 2000; Kono 2007; Simmons 2000). By publicly committing themselves to certain policies, governments may thus be able to improve their prospects for international cooperation.

One of the most common forms of international commitment in today's global economy is the preferential trade arrangement (PTA). PTAs are agreements among small groups of states to liberalize trade among themselves: common examples include the European Union (EU) and the North American Free Trade Agreement (NAFTA). Whether PTAs in fact promote trade is a subject of debate: some studies find that they do (e.g. Frankel 1997), while others conclude that they do not, at least in certain regions or time periods (e.g. Soloaga and Winters 2001; Yeats 1999). Perhaps the most that can be said with certainty is that some PTAs succeed in liberalizing trade among members, while others fail (Hicks and Kim 2010).

The varied performance of PTAs is perhaps not surprising, for these agreements themselves vary greatly (Haftel 2010). As Smith (2000) and Hofmann and Kim (2010) illustrate, some PTAs have more "legalistic" institutions than others, and Kono (2007) has shown that these institutional differences have large effects on trade. PTAs also vary greatly in the extent of proposed liberalization (Kim 2010): some are narrowly sectoral; others purport to liberalize trade in all goods; still others commit members to open trade in services; and some address "new" trade issues such as discrimination in public procurement. Our paper asks whether this last class of commitments has proven effective.

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An important development in international trade is that, over the last few decades, traditional "at the border" barriers such as tariffs and quotas have fallen dramatically. Negotiations today thus focus more on "behind the border" barriers such as subsidies, regulatory standards, and discriminatory public procurement. Governments that discriminate in procurement systematically favor domestic producers over foreign ones when buying otherwise similar goods and services. For example, the "Buy American" provisions in the recent US stimulus program require that stimulus funds be spent only on American-made manufactured goods. The salience of such measures is evident in the reaction of America's trading partners, who universally condemned them as a protectionist violation of US international commitments. Given the size of global procurement markets, such reactions are no surprise. Worldwide, "contestable" procurement markets—that is, public procurement monies that could potentially be spent on imports—account for trillions of dollars in commercial transactions per year (Audet 2002; Beviglia-Zampetti 1997). This suggests that procurement discrimination is an important barrier to global trade.

Governments have tried to control such discrimination in various ways. Historically, they have sought agreements through the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO). However, these agreements have never covered many GATT/WTO members and have been of questionable value (Evenett 2002; Liang 2006). Perhaps for this reason, governments have recently begun concluding procurement agreements within PTAs: we refer to these as preferential procurement agreements (PPAs). This trend is evident in Figure 1.

Figure 1 about here

Figure 1 shows the number of PPAs entering into force each year. They have grown more popular over time, with over half entering into force since 2000. Clearly, governments see PTAs as a potentially fruitful forum for addressing procurement discrimination. However, the actual effectiveness of preferential procurement agreements is unknown. Do PPAs really discourage discriminatory procurement?

This paper is the first to address this question. We assemble an original and comprehensive dataset of PPAs and examine their effects on procurement discrimination in a sample of 112 countries from 1990 to 2007. Specifically, we examine the elasticity of imports to government procurement spending: that is, the percent change in imports produced by a one-percent increase in spending. We generally expect this elasticity to be positive, since at least some procurement spending is typically devoted to imports. These elasticities are informative because, *ceteris paribus*, higher elasticities imply a stronger propensity to spend public funds on imports and hence less discrimination. If PPAs actually discourage discrimination, then the elasticity of imports to procurement spending will be higher among signatories to such agreements. This would imply that PPA members are more inclined than non-members to spend public funds on imports.

We find no such effect. Taken together, PPA signatories are no more inclined than non-signatories to spend procurement funds on imports. Not only is the interaction between the imports-procurement elasticity and PPA membership insignificant; the coefficient is also literally zero, indicating no difference whatsoever between PPA signatories and non-signatories. Examination of individual agreements supports this general result: neither bilateral nor regional PPAs significantly affect signatories' propensity to purchase imports. In all, we present 29 interactions between imports-procurement elasticities and PPA membership, representing different models and estimation techniques, different subsamples, and different PPA variables. Of these 29 coefficients, only one is statistically significant, and

it is incorrectly signed. We thus find no evidence that PPAs have achieved their stated goal of discouraging discrimination in public procurement.

Although our data tell us that these agreements have failed, they do not tell us why.[1] Here, we can only speculate. Theoretically, such agreements might affect government behavior by raising the reputational costs of noncompliance —in this case, discriminatory procurement policies (Keohane 1984). Empirical evidence shows that such reputational effects have encouraged compliance with international trade and monetary law (Busch and Reinhardt 2000; Kono 2007; Simmons 2000). However, the reputational mechanism works only if it is possible to prove that signatories have violated the agreement. This may be relatively easy to do when it comes to conventional trade barriers or current-account restrictions: for example, the 2002 US steel tariffs were an obvious violation of WTO rules. However, as Evenett (2002) observes, proving procurement discrimination is extremely difficult because many aspects of procurement decisions are inherently non-transparent: for example, a technical standard that favors domestic suppliers is not obviously protectionist in intent. Hence, unless the procurement process can be made more transparent, the impact of international treaties in this issue-area may remain limited. This interpretation of our results implies that the WTO is correct to emphasize the need for greater transparency in procurement decisions.[2] That said, our null results suggest that much more needs to be done: current levels of transparency do not support a workable procurement regime.

If this interpretation of our results is correct, they suggest an important qualification to theories about the effects of international commitments. Current theory stresses the role of these agreements in providing information and building reputations (Keohane 1984). Although empirical work shows that international commitments can play such a role, our results suggest that their ability to do so may depend on the transparency of the policy

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[1] Gray (2010) provides an potential explanation for why leaders bother to negotiate agreements that are likely to be ineffective.
[2] http://www.wto.org/english/tratop_e/gproc_e/gptran_e.htm.

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domain. Where the nature of the issue-area makes treaty violations difficult or impossible to detect, international treaties may have limited value. Our results thus point to conditions under which governments are—and are not—likely to keep their international commitments. [3]

Procurement Discrimination and Procurement Agreements

Before proceeding, it is important to define precisely what we mean by procurement discrimination and procurement agreements. Governments engage in procurement discrimination when they favor domestic over foreign suppliers when purchasing otherwise similar goods or services.[4] In rare cases, such discrimination is explicit, as with the Buy American provisions (an outright ban on foreign purchases) or with price discrimination that requires foreign suppliers to undercut domestic ones by a certain amount. More commonly, discrimination is opaque: governments might have tacit understandings with domestic producers (Lowinger 1976); they might give foreign producers insufficient notice of contracting opportunities; or they might draft technical specifications to benefit local suppliers (Beviglia-Zampetti 1997). All of these practices advantage domestic over foreign producers and thus constitute protection of the important public procurement market. As discussed below, the myriad and opaque forms such protectionism may take make it difficult both to enforce procurement agreements and to measure procurement discrimination.

Procurement agreements are international treaties that explicitly forbid some or all forms of discrimination in public procurement. As noted earlier, such agreements have a long and checkered history in both multilateral and preferential fora. A handful of GATT members signed a Government Procurement Code in 1981, but this Code applied to very few

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[3] Our results thus complement those of Copelovitch and Pevehouse (2010), who argue that governments are less likely to comply with international agreements when they retain domestic autonomy over alternative policies that are close substitutes for the proscribed behavior.
[4] By "otherwise similar" we mean that domestic producers do not have obvious cost or quality advantages over their foreign competitors.

members and was widely deemed a failure (Liang 2006). In 1996, the WTO passed an Agreement on Government Procurement (GPA), which expanded and strengthened certain provisions of the earlier Code. Like its predecessor, however, the GPA binds only a minority of WTO members and is of questionable efficacy (Evenett 2002; Liang 2006). Doubts about the GPA's effectiveness may have fueled the recent turn toward preferential agreements. To date, 43 PTAs have concluded agreements to limit government procurement discrimination.

The details of these agreements are discussed further below. For now, note simply that all such agreements prohibit various forms of procurement discrimination. They forbid explicit "buy national" policies such as the recent Buy American provisions: Canada and Mexico, for example, are shielded from these provisions by rules in NAFTA's procurement chapter. Procurement agreements also forbid price discrimination: that is, choosing higher priced domestic bids over lower priced but otherwise identical foreign ones. Beyond this, they typically prohibit a range of other policies that favor domestic firms. For example, they often outlaw local-content requirements, since local firms are much more likely to source their inputs domestically (Grier 1996). These agreements are rarely comprehensive: for example, they often apply to national but not sub-national governments, or only to transactions that exceed a specified monetary threshold. Nonetheless, if observed, they should reduce discrimination in government procurement.

This raises the question: why would governments comply with these agreements? It seems reasonable to assume that signatories have prisoner's dilemma (PD) preferences: each would like access to the others' procurement markets, but each would also like to protect its own market through discrimination. Unless such discrimination is punished, each government has a dominant strategy to discriminate. Although all governments would be better off with mutual nondiscrimination, procurement agreements—like most international

treaties—lack supranational enforcement mechanisms (Downs, Rocke and Barsoom 1996). They must therefore be enforced, if at all, through the decentralized actions of member states.

Research on international institutions suggests that such decentralized enforcement is feasible. As Axelrod (1984) demonstrates, cooperation can emerge from an iterated PD if governments pursue tit-for-tat strategies that reciprocate cooperation and defection. Hence, if governments adopt reciprocal procurement policies, a nondiscriminatory equilibrium could emerge even in the absence of centralized enforcement. An important caveat to this claim, however, is that if information is imperfect, noncooperative or "cheating" behavior may be hard to observe (Keohane 1984). If cheating cannot be detected and punished, cooperation breaks down.

Keohane (1984) argues that international institutions may facilitate cooperation by providing the information needed to pursue reciprocal strategies. Specifically, institutions may do two things. First, they explicitly define cooperation and defection, which is a *sine qua non* for effective reciprocity. Second, they may publicize treaty violations, making them known to a broader audience than they would be in the treaty's absence (Keohane 1984; Mansfield, Milner and Rosendorff 2002). In both ways, institutions make cheating easier to detect and raise the reputational costs of noncompliance. These reputational costs raise the incentives to comply with negotiated agreements; hence the latter offer governments a way out of the prisoner's dilemma. If PPAs perform in this way, then signatories should have less discriminatory procurement policies than non-signatories.

Empirical research on international institutions shows that reputational mechanisms have encouraged compliance with trade agreements (Busch and Reinhardt 2000; Kono 2007) and international monetary law (Simmons 2000). We might thus expect procurement agreements to similarly constrain government behavior. Note, however, that the reputational mechanism can work only if governments are able to detect treaty violations. Although

treaties exist in part to facilitate such detection, there may be cases in which the presence of a treaty may not suffice. Procurement discrimination seems likely to be such a case. As noted earlier, governments can discriminate in myriad ways, most of them opaque. They might, for example, discriminate against foreign producers by tailoring technical requirements specifically to local suppliers (Beviglia-Zampetti 1997). In this case, discrimination would be exceedingly hard to prove. Moreover, as Vagstad (1995) observes, governments can always invoke "quality" as a reason to prefer higher-priced domestic bids—and, because of interest-group pressures, they have strong political incentives to do so. The problem is thus clear: even if an agreement outlaws a host of explicitly discriminatory policies, signatory governments can always discriminate in new ways that are equally effective but less obviously protectionist. Indeed, Evenett (2002) worries that the GPA's focus on explicit discrimination may simply channel discriminatory tendencies into less transparent and more distortionary forms. If such policy substitution is widespread, the prospects for enforcing procurement agreements are grim.

In sum, there are theoretical reasons to believe that PPAs might discourage procurement discrimination. However, the inherently non-transparent nature of the procurement process provides considerable cause for doubt. Whether PPAs actually discourage discriminatory procurement is thus an empirical question.

Data and Analysis

Our goal is to examine the effects of PPAs on procurement discrimination. Our first step is to identify PPAs, which we define as explicit commitments among PTA members to liberalize procurement markets. We do this for all PTAs notified to the GATT/WTO prior to

2010.[5] Using the text of PTA treaties, we identified those with explicit rules regarding

government procurement, also known as "coverage commitments" (Anderson et al. 2010).[6]

These commitments detail liberalization requirements: they define prescribed and proscribed

practices, identify the economic sectors in which procurement is to be liberalized, specify the

government entities to which procurement rules apply, and set monetary thresholds above

which procurement discrimination is banned. Coverage commitments are never total: for

example, they usually apply only to national governments while allowing sub-national

governments to discriminate, and they generally permit discrimination for transactions that

fall below specified monetary thresholds. Nonetheless, coverage commitments are serious

and explicit agreements to reduce discrimination in public procurement.

Not all PTAs that mention procurement seek to liberalize procurement markets. In

fact, some explicitly eschew this goal. For example, the 2006 China-Chile and the 2004

Panama-Taiwan PTAs explicitly exempt procurement from liberalization. Other PTAs

mention procurement liberalization as a worthy goal but contain no specific coverage

commitments. Such agreements are thus merely aspirational (Anderson et al. 2010). For

example, the European Community-Montenegro agreement states in Article 41 that "The

Community and Montenegro consider the opening up of the award of public contracts on the

basis of non-discrimination and reciprocity to be a desirable objective." This is the only

mention of procurement in the entire agreement. Because such agreements entail no concrete

commitments to liberalize procurement markets, we do not consider them PPAs.

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[5] A complete list can be found at http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx
[6] The full texts of the agreements were sourced from McGill University's Database of Preferential Trade
Agreements. When the full text was not available from McGill's database, it was sourced from the member
government's web pages. For example, the full text of the CAFTA-DR agreement was sourced from the United
States' Department of Agriculture web page (http://www.fas.usda.gov/itp/CAFTA/cafta.asp). The text of the
agreement between Canada and Costa Rica was sourced from the Foreign Affairs and International Trade
division of the Canadian Federal Government (http://www.international.gc.ca/trade-agreements-accords-
commerciaux/agr-acc/costarica/Costa_Rica_toc.aspx?lang=en&menu_id=2&menu=R). In cases where the
agreement text was not available in English, we refer to Anderson et al. (2010).

Our key independent variable, PPA_{ijt}, is coded one if PTA members i and j are bound at time t by an explicit commitment to liberalize their procurement markets. All other PTA and non-PTA dyads are coded as zero. Using this rule, we identified 43 PPAs.[7] As a reliability check, we compared our coding with that of Anderson et al (2010), who similarly coded PPAs for all PTAs notified to the WTO after 2000. Although our sample is larger—we include all PPAs notified to the GATT/WTO prior to 2010—there is substantial overlap, and we find no discordances between our measure and theirs. This conformity between the two measures gives us confidence in both the validity and the reliability of our measure.

Table 1 about here

Table 1 lists the 43 agreements and the year in which they came into force. Dates come from the WTO's Regional Trade Agreements Database.[8] Like Figure 1, Table 1 makes clear that PPAs have become increasingly popular. Only two entered into force in the 1980s, compared with seven in the 1990s, sixteen between 2000 and 2004, and eighteen between 2005 and 2009. Why procurement agreements have become more popular is beyond the scope of this paper, but it may reflect the decline in traditional trade barriers and the consequent rise in the salience of public procurement. Alternatively, like the rise in PTAs more broadly, the proliferation of PPAs may reflect disenchantment with the pace of multilateral trade negotiations, which have been deadlocked for the past decade.

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[7] In a majority of these cases, the provisions on government procurement are based on the WTO Agreement on Government Procurement (GPA).

[8] Many agreements begin at the start of the year: for example, the North American Free Trade Agreement (NAFTA) entered into force on January 1, 1994. However, this is not always the case. For example, the European Free Trade Agreement (EFTA)-Chile agreement went into force on December 1, 2003. We code the year of entry into force as $t+1$ when agreements come into force after October 1 in year t. We thus code the EFTA-Chile agreement as entering into force in 2004. This coding acknowledges the fact that, in these cases, governments may continue discriminating for most of year t. In addition, sometimes a given PPA dyad is covered by both a goods agreement and a services agreement. In these cases, we code the PPA as entering into force along with the goods agreement because (1) the goods agreements invariably come into force before the services agreements, thus marking the start of procurement liberalization, and (2) our trade data—the IMF Direction of Trade Statistics—covers only trade in goods.

Having coded PPA membership, our next step is to measure its effects on procurement discrimination. Measuring procurement discrimination is notoriously difficult because, unlike the Buy American measures, most discrimination is not explicit (Miyagiwa 1991). Since overt "buy national" legislation is rare, statute law is unhelpful. Likewise, although detailed information on the tendering process might permit some conclusions, such information is not generally available. Scholars attempting to measure discrimination have thus turned to outcome-based measures. For example, Lowinger (1976) and Trionfetti (2000) both compare the government's propensity to import with that of the private sector. Obtaining detailed data on private and public-sector demand for domestic output and imports, they compare the ratio of imports to domestic consumption in the private and public sectors. The private sector's propensity to import is invariably greater than the public sector's, suggesting that governments generally discriminate in favor of domestic producers. However, holding all else equal, governments vary in their propensity to import, implying that they discriminate to different degrees.

The main drawback of this approach is that the data constraints are severe. Both Lowinger (1976) and Trionfetti (2000) examine only a handful of rich democracies in a single year. This approach permits neither the cross-sectional nor the longitudinal comparisons needed to evaluate the effects of PPAs. We thus adopt a simpler approach: we examine the elasticity of imports to procurement spending, controlling for other determinants of imports. The imports-to-spending elasticity measures the degree to which a rise in spending leads to a rise in imports. *Ceteris paribus*, higher elasticities imply a higher propensity to spend public funds on imports and hence less discrimination. If PPAs reduce procurement discrimination, imports-to-spending elasticities should thus be higher among signatories to such agreements than among non-signatories.

This approach raises the question of how to measure procurement spending. Total government spending is inappropriate, since not all spending can, even in principle, be devoted to imports. For example, salaries for government employees cannot be spent on imports, and the absence of a relationship here would not imply discrimination. Similarly, although military procurement is potentially open to imports, in practice this sector tends to be domestically biased for national security reasons (Audet 2002). Efforts to measure the contestable procurement market—i.e. procurement that could potentially be spent on imports—thus typically exclude these types of spending. The standard measure (EC 2000; Audet 2002) is government spending on goods and services less compensation of employees and defense expenditures. The contestable market is thus smaller than total procurement: in the OECD, the former averages about 40 percent of the latter, or roughly 8 percent of GDP (Audet 2002). This is nonetheless a large sum, amounting to over three trillion dollars in 2008. This gives us some sense of the stakes involved in efforts to pry open procurement markets.

Like previous studies (EC 2000; Audet 2002), we measure contestable procurement as government spending on goods and services, excluding compensation of employees and defense spending. This variable, $Procurement_{it}$, is country i's contestable procurement spending in year t. We obtain our data from the World Bank's *World Development Indicators*, although the original source is the International Monetary Fund's *Government Finance Statistics*. To ensure longitudinal comparability, we employ only data based on the latest accounting standard. This permits time-series analysis but restricts our sample to the post-1990 period. Once other variables are included, we are left with annual procurement data for 112 countries, with unbalanced panels ranging from 1990 to 2007.

We estimate the relationship between procurement and imports using a gravity model of trade, the standard framework for international trade research. Specifically, we employ the following baseline model:

$$\ln(\text{Imports}_{ijt}) = \beta_0 + \beta_1 \ln(\text{Imports}_{ijt-1}) + \beta_2 \ln(\text{Procurement}_{it}) + \beta_3 \text{PPA}_{ijt}$$

$$+ \beta_4 \ln(\text{Procurement}_{it}) * \text{PPA}_{ijt} + \beta_5 \text{GPA}_{ijt} + \beta_6 \ln(\text{Procurement}_{it}) * \text{GPA}_{ijt}$$

$$+ \beta_7 \ln(\text{GDP}_{it} * \text{GDP}_{jt}) + \beta_8 \ln(\text{Population}_{it} * \text{Population}_{jt}) + \beta_9 \text{Trade Taxes}_{it}$$

$$+ \beta_{10} \text{WTO}_{ijt} + \beta_{11} \text{Joint Democracy}_{ijt} + \beta_{12} \text{PTA}_{ijt} + \beta_{13-28} Year_t + \varepsilon_{ijt}.$$

Ln(*Imports$_{ijt}$*) is the log of country *i*'s imports from country *j* in year *t* in constant 2000 dollars. We include lagged imports on the right-hand side because, as Eichengreen and Irwin (1998) observe, trade flows are not only highly autoregressive but also exhibit hysteresis. *Procurement$_{it}$* is described above. Note that, because both procurement and imports are logged, the procurement coefficient tells us the elasticity of imports to procurement spending. We expect this elasticity to be positive and assume that, *ceteris paribus*, higher elasticities imply less procurement discrimination.

PPA$_{ijt}$ is described above. ln(*Procurement$_{it}$*)**PPA$_{ijt}$*, the product of these variables, is included to see whether the effects of procurement spending on imports depend on PPA membership. If PPAs discourage procurement discrimination, the elasticity of imports to procurement spending will be higher among PPA signatories, and the coefficient on ln(*Procurement$_{it}$*)**PPA$_{ijt}$* will be positively signed. Conversely, a small and insignificant coefficient would imply that PPAs do not discourage discrimination in public procurement.

The remaining variables are controls that either theory or previous research suggest should influence imports or the elasticity of imports to spending. *GPA$_{ijt}$* is a dummy for joint

membership in the WTO's Agreement on Government Procurement, which, like PPAs, is meant to discourage discrimination in public procurement.[9] We interact this variable with procurement because, like PPA membership, GPA membership should affect the elasticity of imports to spending. $\ln(GDP_{it}*GDP_{jt})$ and $\ln(Population_{it}*Population_{jt})$ are the logged products of i's and j's GDPs (in constant 2000 dollars) and populations, respectively, and are standard gravity-model variables. *Trade Taxes_{it}* is country i's taxes on trade as a percent of GDP and is included to control for the effects of other types of trade barriers. *WTO_{ijt}* is a dummy for joint membership in the WTO, which may promote trade (Tomz, Goldstein and Rivers 2007). *Joint Democracy_{ijt}* is a dummy variable coded 1 when both dyad members are democracies, defined as a Polity IV score of 6 or above. We include this variable because previous research (Mansfield, Milner and Rosendorff 2000) shows that joint democracy promotes trade. *PTA_{ijt}* is a dummy for joint membership in a PTA, which controls for the possibility that PTA membership promotes trade. Finally, *Year_t* is a dummy for year t, included to control for unobserved year-specific effects.[10]

Although our gravity model specification is conventional, several points warrant mention. First, we employ dyad fixed effects. We do this for two reasons. First, as Anderson and Van Wincoop (2003) demonstrate, trade flows between countries i and j are affected, not only by trade costs between these countries, but by trade costs between each of these countries and the rest of the world. Dyad fixed effects control for this "multilateral resistance" and, more generally, for any time-invariant dyad-specific factors. Second, PPAs are not exogenous random variables: countries self-select into these agreements. The

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[9] The joint (as opposed to monadic) membership dummy is appropriate because the GPA, unlike most WTO agreements, is plurilateral. It thus creates reciprocal rights and obligations only for those WTO members that have signed it.

[10] Import data are from the International Monetary Fund's *Direction of Trade Statistics*. GDP, population, and trade tax data are from the World Bank's *World Development Indicators*. Polity IV data are available at http://www.systemicpeace.org/polity/polity4.htm (accessed December 28, 2009). Data on WTO membership are from Tomz, Goldstein and Rivers (2007). Data on GPA, PTA and PPA membership are from the WTO (http://www.wto.org/).

endogeneity of PPAs complicates efforts to estimate their effects. Although one might

address this problem through instrumental-variable or selection models, Baier and Bergstrand

(2004, 2007) argue forcefully against this approach. As they point out, it is virtually

impossible to find suitable instruments for such models; hence instrumented results are highly

unstable. Instead, they recommend using panel data with dyad and year fixed effects. They

demonstrate that strong, reliable inferences about the effects of PTAs can be drawn from

panel-data gravity models with dyad and year fixed effects. Their approach is becoming

standard practice: for example, Tomz et al. (2007) employ it to estimate the effects of

GATT/WTO membership on trade. We thus follow their example as well.

The use of dyad fixed effects has two important implications. First, because it

eliminates cross-dyadic variation in all variables, it is neither possible nor necessary to

include time-invariant dyadic variables such as distance, contiguity, common language, and

so on. We thus omit these gravity variables. Second, for the same reason, our analysis

reveals only the within-dyad or over-time relationship between procurement and imports.

This is desirable, as we wish to determine, not whether PPA members have high imports-to-

spending elasticities, but whether these elasticities increase after countries join a PPA. The

latter finding would provide much stronger evidence than the former that PPA membership

actually *affects* procurement discrimination.

A second noteworthy feature of our model is the inclusion of trade taxes on the right-

hand side. This is unusual, since gravity models typically aim to draw inferences about trade

policies, including trade taxes. However, we wish to isolate the effects of a particular type of

trade policy: procurement discrimination. It is thus important to control as completely as

possible for other policies that might affect imports, such as trade taxes.

When all variables are included, our sample consists of 112 countries, 15,512 dyads,

and 137,407 observations, with unbalanced panels ranging from 1990 to 2007. We cluster

standard errors by dyad to correct for possible serial correlation. Results are presented in Table 2.

Table 2 about here

Model 1 is our baseline model. The coefficient on procurement tells us the elasticity of imports to spending in non-PPA and non-GPA dyads, i.e. about 96 percent of the sample. It is positive and highly significant, indicating that increases in government procurement spending generally lead to higher imports. Specifically, a one-percent rise in spending leads, on average, to a 0.1 percent increase in imports. In contrast, the $\ln(Procurement_{it})*PPA_{ijt}$ coefficient —which tells us how imports-spending elasticities differ between PPA and non-PPA dyads—is not only insignificant but is also literally zero. In other words, PPAs have no effect on signatories' propensity to discriminate against foreign suppliers.

Because procurement is interacted with two variables—PPA and GPA membership— a full understanding of the procurement-imports relationship requires a bit more analysis. The two interactions imply four conditional elasticities: in non-PPA dyads, both with and without GPA membership, and in PPA dyads, both with and without GPA membership. These conditional elasticities are shown in Table 3.

Table 3 about here

The first row of Table 3 shows the imports-procurement elasticity in both non-PPA dyads (C1) and PPA dyads (C2) for dyads that do not belong to the GPA. The second row shows these elasticities for GPA dyads. The main point to note is that there is no difference between PPA and non-PPA dyads: the PPA and non-PPA elasticities are identical for both

GPA and non-GPA dyads, reflecting the zero coefficient on the interaction term. Column 3 (C3) presents a Wald test of the null hypothesis that the C1 and C2 coefficients are identical. As C3 shows, we are 99.9 percent certain that this null hypothesis is true. Our baseline model thus provides no evidence that PPAs matter.

It is interesting to note that the elasticities for non-GPA dyads (R1) and GPA dyads (R2) do differ significantly. The imports-procurement elasticity is much lower in GPA dyads and is not significant, and the difference between the R1 and R2 coefficients is highly significant (p=0.000). These differences reflect the highly significant coefficient on the ln($Procurement_{it}$)*GPA_{ijt} interaction term. This result is surprising, as joint GPA membership should, in theory, reduce discrimination and increase the elasticity of imports to spending. Since our focus is on preferential agreements, we do not attempt to explain this result here. However, it constitutes an interesting puzzle for future research.

Our model specification is conservative, particularly our decision to include a lagged dependent variable (DV). Although this is appropriate on both theoretical and methodological grounds, the inclusion of a lagged DV may create bias against positive results (Achen 2000). Hence, to give PPAs a "fair chance," model 2 repeats the analysis without the lagged DV. Removing the lagged DV does not affect our results: the procurement coefficient remains positive and highly significant, while the ln($Procurement_{it}$)*PPA_{ijt} coefficient remains insignificant and very close to zero.

Previous research has found that alliances and militarized interstate disputes (MIDs) affect trade (Mansfield and Bronson 1997). We do not include these variables in our baseline model because they are available only through 2001; hence their inclusion leads to the loss of over half our observations. As a robustness check, however, we include these variables in models 3 and 4. *Alliance$_{ijt}$* is a dummy for joint membership in a military alliance; *MID$_{ijt}$* is a

dummy for joint involvement in a militarized interstate dispute.[11] Models 3 and 4 include

and exclude the lagged DV, respectively. Neither the inclusion of these controls nor the

consequent change in sample size significantly alters our results.

A number of studies show that trade affects government spending (Cameron 1978;

Rodrik 1998).[12] This raises concerns that procurement spending may be endogenous to

imports. However, we do not believe this is true, for two reasons. First, prior research

examines either total government spending (Cameron 1978; Rodrik 1998) or social spending

alone (Rudra 2002; Rudra and Haggard 2005). It thus provides no evidence that trade affects

procurement spending *per se*. Second, we find no statistical evidence of endogeneity. We

perform a Hausman test of the hypothesis that procurement is exogenous and are unable to

reject this hypothesis ($p = 0.95$). Nonetheless, as a robustness check, we repeat our analysis

using two-stage least-squares (2SLS) regressions. We instrument procurement using total tax

revenues less revenues from import taxes, which are endogenous to imports. Tax revenues

should affect imports via procurement spending, and this instrument is strong in a statistical

sense, explaining over 90 percent of the variation in procurement. Whether revenues are

excludable from the main regression is less clear on theoretical grounds, but they are

uncorrelated with the residuals from the first-stage regression. Our instrument is thus valid

statistically. We instrument the PPA and GPA interaction terms with the interaction between

tax revenues and PPA and GPA membership, respectively. Results of the 2SLS regressions

are shown in model 5; note simply that this procedure does not change our results. We obtain

very similar results if we omit the lagged DV, but to save space we do not present these

results here.

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[11] Data on alliances and MIDs are available at http://www.correlatesofwar.org/Datasets.htm (Accessed December 28, 2009).

[12] The nature of this impact may be different in rich and poor countries (Rudra 2002; Wibbels 2006) and may also depend on regime type (Rudra and Haggard 2005).

Results for the control variables are generally unremarkable. As expected, GDP, WTO membership, and shared alliance membership are associated with significantly greater trade. Higher trade taxes are associated with significantly lower trade. The insignificance of joint democracy is surprising,[13] but it should be noted that previous research (e.g. Mansfield, Milner and Rosendorff 2000) is based on cross-sectional rather than over-time comparisons and examines earlier time periods than we examine here. It may be that there are simply too few changes in joint democracy in our sample to produce noticeable effects.[14] Finally, it is interesting that our PTA variable is insignificant. This likely reflects our coding of PTAs rather than our sample or methodology. If, for example, we employ Rose's (2004) PTA dummy—updated to 2007—we find, like him, that it is robustly positive and significant. However, this dummy is coded one for only ten relatively well-known PTAs, even though, according to the WTO, there are now 219 PTAs in force. It thus codes as zero the vast majority of regional and bilateral PTAs. Our variable encompasses all of these agreements and thus presumably includes more "failed" PTAs.[15] This may explain our insignificant results and underscores our earlier point that not all PTAs have been equally effective.

More Robustness Checks

Economic theory suggests a number of factors that might affect the relationship between procurement discrimination and imports. It is not sufficient simply to include these variables as controls, since they may affect not imports *per se* but rather the elasticity of imports to procurement spending. In other words, imports-procurement elasticities may be conditional on these variables. Since including numerous three-way interaction terms would

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[13] It is, however, consistent with findings reported by Büthe and Milner (2008).

[14] Alternatively, it may be that while democracy is not significant by itself, democracy may condition the effect of preferential agreements, as suggested by Büthe and Milner (2010). However, the systematic analysis of the interaction between international and domestic institutions is beyond the scope of this paper.

[15] A similarly comprehensive measure of PTAs is employed by Baccini and Dür (2010).

be presentationally very messy, we adopt the simpler approach of splitting our sample along theoretically motivated lines and presenting the split-sample results.

Our first set of robustness checks draws a distinction between developed and developing countries. Economic models show that procurement discrimination should have a stronger negative effect on imports when the procured goods are highly differentiated (Baldwin 1970; Miyagiwa 1991). Since North-North trade tends to involve more differentiated products than North-South or South-South trade (Helpman and Krugman 1985; Manger 2010), we might expect procurement discrimination to be most salient in North-North dyads. However, the implications for PPAs are not clear: the salience of procurement discrimination in North-North trade might mean that PPAs are most effective in this group, but it could also mean that procurement liberalization is politically difficult, undermining PPA implementation. Either way, it makes sense to see whether PPAs have different effects in rich and poor trading dyads.

The International Monetary Fund (IMF) classifies countries as industrialized (developed) and non-industrialized (developing). We employ the IMF's classification to break our sample into three types of dyads: North-North dyads consisting only of rich countries, South-South dyads consisting only of poor countries, and North-South dyads consisting of one rich and one poor country. We estimate our model, both with and without the lagged DV, for all three groups. Results are shown in Table 4. Note simply that ln($Procurement_{it}$)*PPA_{ijt} never approaches statistical significance in any group. PPAs are thus irrelevant across trading partners at all levels of economic development.

Table 4 about here

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The elasticity of imports to procurement spending might also depend on how diversified the domestic economy is. Highly diversified economies offer a wider range of goods and services, so governments in such economies should have less need to buy goods and services from abroad. In other words, the elasticity of imports to spending should be low when economic diversification is high. If so, PPAs that bar discrimination may be largely irrelevant in highly diversified economies but may matter more when diversification is low.

To test this hypothesis, we develop two measures of economic diversification: one based on output and one based on exports. The output-based measure is an inverse Herfindahl index based on sectoral output shares. For each country, we obtain each sector's share of national output, where sectors are defined by the four-digit International Standard Industrial Classification. The Herfindahl index is the sum of squared output shares and ranges from zero to one; our measure of diversification is simply one minus the Herfindahl index. It thus approaches one when the economy consists of numerous small sectors and approaches zero when the economy is dominated by one large sector. The export-based measure is calculated the same way, except that it is based on each sector's share of national exports, where sectors are defined by the four-digit Standard International Trade Classification.[16] To avoid losing countries and years for which data are not available—the export data end in 2000 and the output data are missing for many countries in the early 1990s—we calculate diversification as the average for 1996-2000. Diversification is thus a constant for each country, but this is unproblematic, since we wish merely to draw broad distinctions between more and less diversified economies.

For each measure, we split our sample into highly diversified and less diversified importing countries, defined as countries with diversification scores above and below the sample median, respectively. We then estimate our model on each subsample. To save

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[16] Output data are from UNIDO's Industrial Statistics Database. Export data are from Feenstra et al (2004).

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space, we present only models including the lagged DV, but models without the lagged DV yield very similar results. Results are presented in Table 5.

<center>Table 5 about here</center>

Models 12 and 13 (14 and 15) present results for countries with high and low output (export) diversification, respectively. These results are easily summarized: the ln($Procurement_{it}$)*PPA_{ijt} coefficient never approaches significance in any subsample. The irrelevance of PPAs thus does not depend on importers' economic diversification.

A final consideration has to do with the level of government spending. Baldwin (1970) argues that procurement discrimination should have larger effects on imports when government spending is high relative to domestic output. This is because, when government spending is low, the discrimination-induced fall in government demand for imports is offset by a rise in private demand, as the government consumes more of domestic output. As with economic development, the implications for PPAs are unclear. The greater economic salience of procurement discrimination when spending is high could make PPAs more relevant, but it could also increase political resistance to PPA implementation. Nonetheless, theory suggests that we should examine whether the effects of PPAs depend on the level of government spending. We thus split our sample into high-spending and low-spending countries, depending on whether the ratio of procurement spending to GDP falls above or below the annual sample median, respectively. Models 16 and 17 in Table 5 present results for high and low-spending countries, respectively. Again, the ln($Procurement_{it}$)*PPA_{ijt} coefficient is very small and statistically insignificant. The irrelevance of PPAs does not depend on the level of government spending.

<center>22</center>

Our analysis thus far has pooled all PPAs together to determine their average effects. It is possible, however, that some PPAs matter while others do not. As a final exploration, we thus disaggregate our PPA measure to look at individual PPAs. Specifically, we break PPAs down into six groups: those between members of the European Economic Area (EEA), bilateral agreements between the EU and non-EEA countries, bilateral agreements between the European Free Trade Association (EFTA) and non-EEA countries, the preferential procurement agreements among NAFTA members, the PPA among members of the Central American Free Trade Agreement (CAFTA), and purely bilateral PPAs that are not associated with any regional agreement.[17] We interact each PPA dummy with procurement. Results are presented in Table 6.

Table 6 about here

Models 18 and 19 present results with and without a lagged DV, respectively. The overall picture mirrors our previous results: of the 12 procurement*PPA interaction terms, 11 are insignificant. The only exception is the NAFTA interaction term when the lagged DV is excluded, and this has a negative sign, indicating that the imports-procurement elasticity is lower among NAFTA members. We have no explanation for this result, but note simply that it is not robust (it does not survive the inclusion of the lagged DV) and, as only one out of twelve coefficients, is an outlier. The main picture to emerge from Table 6 is that individual PPAs, like PPAs as a group, do not significantly modify the elasticity of imports to procurement spending.

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[17] We do not include the EU and EFTA themselves because together they constitute the EEA. The EU provides most of the EEA's membership; hence the correlation between the two groupings is over 0.9. If we instead drop the EEA and include the EU and EFTA separately, both are insignificant.

Conclusion

As traditional trade barriers have fallen, governments have increasingly resorted to less transparent measures such as discriminatory public procurement. In an effort to control such measures, many governments have begun regulating the use of these measures in preferential trade agreements. For example, many recently concluded PTAs explicitly prohibit government procurement practices that discriminate against foreign goods. In theory, these agreements commit their signatories to open up their procurement markets to competition from other PTA members. The practice, we have found, is very different. In this paper, we compared the elasticity of imports to procurement spending in dyads with and without preferential procurement agreements. We found that the difference between these groups was both very small and statistically insignificant. An exhaustive series of robustness checks—employing different model specifications, estimation techniques, samples, and PPA variables—supported this baseline result. We are thus confident that PPAs have failed to discourage discrimination in public procurement.

As noted earlier, this result is not wholly surprising. To the extent that international commitments constrain government behavior, they do so by publicizing treaty violations and raising reputational concerns (Keohane 1984). In other words, the power of these commitments rests on the information they provide. Where information is rich—that is, where treaty violations are easy to identify and prove—international agreements may constrain state behavior, as many empirical studies conclude (Busch and Reinhardt 2000; Hicks and Kim 2010; Kono 2007; Simmons 2000). However, in some policy domains, treaty violations may be hard to prove. For example, if a PPA bans explicit procurement discrimination, governments might covertly favor domestic suppliers by tailoring technical requirements to local firms or by invoking subjective "quality" assessments. Although such

policies violate the spirit of the treaty, trading partners might be unable to prove that they violate its letter. This ambiguity might prevent trading partners from punishing the suspected violation, or, alternatively, might cause them to reciprocate with disguised protection of their own. Either way, lack of transparency in public procurement undermines the informational basis for treaty enforcement. In short, information-poor policy environments make it hard for governments to keep their commitments. This would explain why PPAs do not work.

This interpretation of our results has worrisome implications for a number of important policy domains. Trade negotiations today increasingly focus on less transparent policies: not only public procurement but also competition policy, sanitary and phytosanitary standards, and other technical barriers to trade. Both survey and econometric research show that these new barriers have become at least as important as more traditional ones such as tariffs and quotas (Henson and Loader 2000). Our results suggest, however, that international treaties may have little effect on these new, non-transparent barriers to trade.

Ironically, the historical success of international agreements may have created conditions in which subsequent agreements will enjoy much less success. As treaties have eliminated transparent trade barriers, governments have increasingly resorted to less transparent measures. According to our results, these are precisely the policies that international agreements cannot effectively control. A pessimistic conclusion is that international negotiations may have gone as far as they can in liberalizing global markets. Optimists might retort that the WTO continues to seek greater transparency in procurement and other new areas of trade policy conflict.[18] Our results suggest that such efforts are worthwhile, and time will tell whether or not they bear fruit. At present, however, its seems that the transparency needed to support a workable procurement regime has not yet been achieved.

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[18] http://www.wto.org/english/tratop_e/gproc_e/gptran_e.htm.

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Table 1. PTAs with Procurement Coverage Commitments	
Year	Agreement
1983	Australia-New Zealand
1985	US-Israel
1994	European Community (EC)
1994	European Economic Area (EEA)
1994	North American Free Trade Agreement (NAFTA)
1995	Costa Rica-Mexico
1997	Canada-Israel
1998	Mexico-Nicaragua
1999	Chile-Mexico
2000	EC-Mexico
2000	Israel-Mexico
2001	European Free Trade Agreement (EFTA)-Mexico
2001	New Zealand-Singapore
2002	Chile-El Salvador
2002	Chile-Costa Rica
2003	Japan-Singapore
2003	EC-Chile
2003	EFTA-Singapore
2003	Panama-Costa Rica
2003	Panama-El Salvador
2003	Singapore-Australia
2004	Korea-Chile
2004	US-Singapore
2004	US-Chile
2005	EFTA-Chile
2005	Japan-Mexico
2005	US-Australia
2006	Central American Free Trade Agreement-Dominican Republic (CAFTA-DR)
2006	EFTA-South Korea
2006	South Korea-Singapore
2006	Panama-Singapore
2006	US-Bahrain
2006	US-Morocco
2007	Chile-Japan
2008	EC-Caribbean Forum of African, Caribbean and Pacific (CARIFORUM) States
2009	Australia-Chile
2009	Canada-EFTA
2009	Canada-Peru
2009	Chile-Colombia
2009	Japan-Switzerland
2009	Peru-Singapore
2009	US-Peru
2009	US-Oman

Table 2. Procurement, Imports, and Preferential Procurement Agreements					
Independent Variable	All models with dyad and year fixed effects				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) 2SLS
Ln(Procurement$_{it}$)	.105*** (.021)	.121*** (.026)	.119*** (.026)	.112*** (.029)	.105*** (.024)
Ln(Procurement$_{it}$)*PPA$_{ijt}$	-.000 (.019)	.004 (.031)	-.070 (.116)	-.022 (.176)	.016 (.020)
PPA$_{ijt}$	-.043 (.425)	-.142 (.658)	1.48 (2.52)	.544 (3.75)	-.393 (.443)
Ln(Procurement$_{it}$)*GPA$_{ijt}$	-.077*** (.022)	-.093*** (.030)	.031 (.043)	-.007 (.060)	-.075*** (.026)
GPA$_{ijt}$	1.57*** (.494)	1.81*** (.670)	-.881 (.976)	-.188 (1.37)	1.52*** (.577)
Ln(GDP$_{it}$*GDP$_{jt}$)	.347*** (.051)	.479*** (.063)	.131 (.084)	.167* (.086)	.344*** (.052)
Ln(POP$_{it}$*POP$_{jt}$)	.181 (.210)	-.098 (.263)	3.09*** (.417)	2.06*** (.428)	.201 (.210)
Trade Taxes$_{it}$	-3.66** (1.60)	.839 (1.85)	-11.5*** (2.05)	-6.17*** (2.04)	-3.69** (1.60)
WTO$_{ijt}$	.392*** (.061)	.426*** (.076)	.393*** (.090)	.359*** (.093)	.379*** (.061)
Joint Democracy$_{ijt}$	-.011 (.050)	.020 (.065)	-.249*** (.093)	-.276*** (.106)	-.010 (.050)
PTA$_{ijt}$	.018 (.067)	.080 (.087)	-.076 (.115)	-.123 (.130)	.015 (.065)
Alliance$_{ijt}$			.205* (.121)	.225* (.132)	
MID$_{ijt}$			.280 (.436)	.410 (.429)	
Ln(Imports$_{ijt-1}$)	.253*** (.006)		.121*** (.007)		.251*** (.006)
Constant	-16.2** (7.40)	-12.4 (9.03)	-99.4*** (13.5)	-66.4*** (13.8)	
Observations	137,407	143,512	63,874	69,979	135,673
P > F	0.0000	0.0000	0.0000	0.0000	0.0000

Dependent variable: ln(Imports$_{ijt}$)
Robust-cluster standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Table 3. Conditional Elasticities of Imports to Procurement			
	C1: No PPA	C2: PPA	C3: Wald Test H_0: C1 = C2
R1: No GPA	.105*** (.021)	.105*** (.028)	0.999
R2: GPA	.028 (.030)	.028 (.028)	
R3: Wald Test H_0: R1 = R2	0.000		

Independent Variable	North-North Dyads		South-South Dyads		North-South Dyads	
	(6)	(7)	(8)	(9)	(10)	(11)

Table 4. Conditioning on Economic Development

All models OLS with dyad and year fixed effects

Independent Variable	North-North Dyads (6)	North-North Dyads (7)	South-South Dyads (8)	South-South Dyads (9)	North-South Dyads (10)	North-South Dyads (11)
$\text{Ln(Procurement}_{it})$	.043 (.067)	.095 (.128)	.146*** (.026)	.166*** (.031)	-.019 (.036)	-.024 (.048)
$\text{Ln(Procurement}_{it})*\text{PPA}_{ijt}$	-.029 (.046)	.074 (.127)	.060 (.053)	.025 (.072)	-.012 (.027)	-.030 (.034)
PPA_{ijt}	.685 (1.01)	-1.42 (2.78)	-1.48 (1.07)	-.891 (1.45)	.200 (.627)	.513 (.799)
$\text{Ln(Procurement}_{it})*\text{GPA}_{ijt}$	-.013 (.038)	.028 (.066)	.044 (.059)	.108 (.076)	-.007 (.029)	.026 (.035)
GPA_{ijt}	.368 (.847)	-.547 (1.49)	-.764 (1.26)	-2.06 (1.62)	.043 (.671)	-.736 (.811)
$\text{Ln(GDP}_{it}*\text{GDP}_{jt})$	.433*** (.149)	.656*** (.173)	.189*** (.063)	.263*** (.076)	.688*** (.093)	.968*** (.120)
$\text{Ln(POP}_{it}*\text{POP}_{jt})$	-1.08*** (.352)	-1.73 (1.10)	-.240 (.270)	-.395 (.333)	-.641* (.355)	-1.78*** (.471)
Trade Taxes_{it}	-5.62 (15.0)	-45.9 (28.5)	-1.62 (1.96)	4.94** (2.26)	-3.51* (1.99)	-3.17 (2.35)
WTO_{ijt}			.306*** (.076)	.279*** (.094)	.435*** (.096)	.563*** (.116)
$\text{Joint Democracy}_{ijt}$	-.106** (.053)	-.280** (.114)	-.014 (.074)	.016 (.094)	.043 (.063)	.094 (.083)
PTA_{ijt}	-.034 (.079)	-.307* (.185)	.125 (.115)	.250* (.147)	-.125** (.057)	-.183** (.075)
$\text{Ln(Imports}_{ijt-1})$	.407*** (.075)		.252*** (.006)		.242*** (.014)	
Constant	23.7* (12.2)	4.50 (38.5)	3.03 (9.70)	4.14 (11.6)	-2.20 (12.2)	25.0 (16.3)
Observations	4,787	4,892	88,090	92,635	44,530	45,985
P > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Dependent variable: $\text{ln(Imports}_{ijt})$
Robust-cluster standard errors in parentheses   *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Independent Variable	Table 5. Conditioning on Economic Diversification and Spending					
	All models OLS with dyad and year fixed effects					
	Output Diversification		Export Diversification		Spending ÷ GDP	
	(12) HI	(13) LO	(14) HI	(15) LO	(16) HI	(17) LO
$\text{Ln(Procurement}_{it})$	.102*** (.022)	.125 (.086)	.125*** (.044)	.108*** (.024)	.078 (.085)	.036 (.024)
$\text{Ln(Procurement}_{it})*\text{PPA}_{ijt}$	-.013 (.017)	.056 (.093)	-.000 (.023)	.029 (.043)	.003 (.097)	.007 (.019)
PPA_{ijt}	.260 (.364)	-1.32 (2.08)	.028 (.503)	-.924 (.843)	-.090 (2.11)	-.215 (.410)
$\text{Ln(Procurement}_{it})*\text{GPA}_{ijt}$	-.048** (.020)	-.177** (.085)	-.062*** (.023)	-.270* (.157)	-.176** (.075)	-.059*** (.022)
GPA_{ijt}	.944** (.450)	3.71* (1.93)	1.28** (.521)	6.47* (3.55)	3.67** (1.67)	1.15** (.492)
$\text{Ln(GDP}_{it}*\text{GDP}_{jt})$	.275*** (.063)	.482*** (.102)	.483*** (.064)	.076 (.092)	.291*** (.091)	.493*** (.067)
$\text{Ln(POP}_{it}*\text{POP}_{jt})$	.531** (.256)	-.349 (.376)	.231 (.259)	-.274 (.438)	-.355 (.352)	.228 (.293)
Trade Taxes_{it}	3.45* (1.91)	-13.5*** (2.78)	-2.45 (1.90)	-4.05 (2.66)	2.67 (2.70)	-9.03*** (2.32)
WTO_{ijt}	.112 (.073)	.906*** (.109)	.720*** (.075)	-.186* (.107)	.630*** (.113)	.359*** (.081)
$\text{Joint Democracy}_{ijt}$	-.051 (.058)	.051 (.094)	-.065 (.057)	.101 (.103)	-.067 (.104)	.109* (.061)
PTA_{ijt}	.122 (.078)	-.130 (.122)	-.114* (.058)	.207 (.151)	.0205 (.151)	-.052 (.081)
$\text{Ln(Imports}_{ijt-1})$	.247*** (.007)	.261*** (.009)	.244*** (.007)	.267*** (.010)	.209*** (.010)	.235*** (.007)
Constant	-24.1*** (8.87)	-6.93 (13.5)	-24.7*** (9.25)	11.0 (14.5)	4.46 (12.4)	-23.1** (1.22)
Observations	89,047	47,101	93,210	44,197	43,971	93,436
P > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Dependent variable: $\text{ln(Imports}_{ijt})$
Robust-cluster standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Table 6. Import-Procurement Elasticities in Individual PPAs		
Independent Variable	All models OLS with dyad and year fixed effects	
	(18)	(19)
Ln(Procurement$_{it}$)	.105 (.021)***	.121 (.026)***
Ln(Procurement$_{it}$)*EEA PPA$_{ijt}$	-.013 (.041)	.020 (.066)
Ln(Procurement$_{it}$)*EU-Bilateral PPA$_{ijt}$	.057 (.069)	.015 (.093)
Ln(Procurement$_{it}$)*EFTA-Bilateral PPA$_{ijt}$	.060 (.083)	.030 (.120)
Ln(Procurement$_{it}$)*NAFTA PPA$_{ijt}$	-.185 (.141)	-.388 (.178)**
Ln(Procurement$_{it}$)*CAFTA PPA$_{ijt}$	-.017 (.014)	-.034 (.023)
Ln(Procurement$_{it}$)*Bilateral PPA$_{ijt}$	.013 (.041)	.010 (.053)
Ln(Procurement$_{it}$)*GPA$_{ijt}$	-.044 (.028)	-.052 (.036)
EEA PPA$_{ijt}$	.421 (.895)	-.199 (1.42)
EU-Bilateral PPA$_{ijt}$	-1.45 (1.54)	-.687 (2.11)
EFTA-Bilateral PPA$_{ijt}$	-1.61 (1.84)	-1.17 (2.70)
NAFTA PPA$_{ijt}$	3.76 (3.23)	8.27** (4.07)
CAFTA PPA$_{ijt}$	.214 (.301)	.529 (.517)
Bilateral PPA$_{ijt}$	-.650 (.947)	-.810 (1.22)
GPA$_{ijt}$	.755 (.641)	.761 (.808)
Ln(GDP$_{it}$*GDP$_{jt}$)	.345 (.051)***	.476 (.063)***
Ln(POP$_{it}$*POP$_{jt}$)	.182 (.210)	-.096 (.263)
Trade Taxes$_{it}$	-3.60 (1.60)**	.924 (1.85)
WTO$_{ijt}$	.390 (.061)***	.423 (.076)***
Joint Democracy$_{ijt}$	-.008 (.050)	.025 (.065)
PTA$_{ijt}$	.038 (.070)	.116 (.090)
Ln(Imports$_{ijt-1}$)	.253 (.006)***	
Constant	-16.11 (7.40)**	-12.4 (9.03)
Observations	137,407	143,512
P > F	0.0000	0.0000

Dependent variable: ln(Imports$_{ijt}$)
Robust-cluster standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Figure 1. Preferential Procurement Agreements Entering Into Force, 1980-2009