

Policy Transparency and Compliance with International Agreements

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Abstract

Over the past several decades international trade agreements have grown both more common and more ambitious. Today, many agreements regulate non-transparent “behind-the-border” barriers to trade. One particularly opaque form of trade protection is discrimination in public procurement. Increasingly, preferential trade agreements prohibit governments from discriminating against foreign bidders when buying goods and services. We know little, however, about the effectiveness of these rules. Using an original dataset of preferential procurement agreements, we examine their effects on procurement discrimination in 112 countries from 1990 to 2007. We find that preferential procurement agreements have no effect on governments’ purchasing behavior: signatories are no more inclined than non-signatories to spend public funds on imports. This suggests an important qualification to existing theories of compliance. While reputational concerns may sometimes ensure that governments abide by international agreements, reputational concerns have limited effectiveness in deterring noncompliance in opaque policy areas where treaty violations are difficult to detect. Our results thus shed light on the conditions under which governments do *not* keep their international commitments.

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International agreements are increasingly frequent in today's globalized world. As the number of international agreements grows, so too does their variety: agreements cover topics as diverse as human rights, international trade, and the environment. International agreements thus potentially preside over a huge range of governmental activities by formally and publicly obliging countries to adopt some policies and refrain from others. However, in an anarchic world, no supranational enforcement exists to compel national governments to comply with international agreements. The effectiveness of international agreements therefore depends critically on governments' voluntary compliance with the agreed rules and obligations.

Scholarship on countries' compliance with international agreements generally falls into two broad camps. Realists argue that, without supranational enforcement, governments have few incentives to comply with agreements they do not wish to keep. Observed compliance with international commitments thus reflects selection effects: states only commit to actions they already want to take (Downs, Rocke and Barsoom 1996; Mearsheimer 1994-95; Von Stein 2005). Institutionalists retort that, by providing information, international institutions can facilitate decentralized enforcement by member states. International agreements can consequently affect state behavior even in the absence of supranational enforcement (Keohane 1984; Keohane and Martin 1995).

Both views tend to take high levels of compliance as given. It is generally assumed that "almost all nations observe...almost all of their obligations almost all of the time" (Henkin 1979: 47). However, substantial variation exists in compliance behaviour. While some countries regularly comply with international agreements, others habitually (or occasionally) violate them (Rickard 2010; Davis 2011). Despite variance in countries' compliance records, the scholarly debate has generally focused, not on whether states comply with their commitments, but on why. Perhaps because of this focus, scholars have seldom

investigated the conditions under which states are likely to violate their international commitments.

Understanding when and under what conditions governments violate their international obligations is important. Noncompliance with international agreements may generate conflict between states. For example, violations of the World Trade Organization's rules often provoke formal legal disputes between member states that entail real costs in terms of time and resources (Guzman and Simmons 2002). Furthermore, noncompliance undermines the effectiveness of international agreements and the spirit of international cooperation.

Institutionalist theory can help predict noncompliance with international commitments. According to institutionalist logic (Keohane 1984; Keohane and Martin 1995), a key function of international institutions is to provide information that affects states' reputations. Empirical research 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 can only work to deter noncompliance when treaty violations are observable. Violations of international agreements may be relatively easy to observe in certain policy areas, such as conventional trade barriers. For example, the steel tariffs implemented by the United States government in 2002 were a clear violation of World Trade Organization (WTO) rules. However, there may be other policy domains in which noncompliance with international rules is far less transparent. For example, governments may use opaque "behind-the-border" trade barriers to protect domestic producers from foreign competition. These barriers include, for example, regulatory standards and discrimination by governments against foreign producers when purchasing goods and services. In these opaque policy areas, the reputational mechanism suggested by institutionalist theory cannot work to deter noncompliance with international agreements; it is

impossible to punish a country for a treaty violation that cannot be observed. Governments are therefore less likely to keep their international commitments in opaque policy areas, such as public procurement. Public procurement is the process by which governments purchase goods and services for governmental purposes. Governments that discriminate in procurement systematically favor domestic producers over foreign ones when buying otherwise similar goods or services.¹

In this study, we compile an original and comprehensive dataset of international agreements that prohibit discrimination in public procurement and examine the effects of these agreements using a sample of 112 countries from 1990 to 2007. We find that international procurement agreements have no effect on governments' purchasing behavior: signatories are no more inclined than non-signatories to spend public funds on imports. In other words, international procurement agreements are ineffective in reducing discrimination by governments against foreign bidders when buying goods and services.

The results suggest an important qualification to theories about the effects of international agreements. Current theory stresses the role of international agreements in providing information and building reputations (Keohane 1984). Although research 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 domain. Where the nature of the issue-area makes treaty violations difficult or impossible to detect, international agreements may have limited effectiveness in constraining national governments or altering governmental

¹ By "otherwise similar" we mean that domestic producers do not have obvious cost or quality advantages over their foreign competitors.

behaviour. This study thus contributes to the literature on compliance by highlighting the conditions under which governments are *not* likely to keep their international commitments.²

Policy Transparency and Public Procurement

Governments are less likely to comply with international agreements in opaque policy areas. The issue of policy opacity is increasingly important because, over the last few decades, transparent “at-the-border” trade barriers such as tariffs and quotas have fallen dramatically. Transparent trade barriers have been steadily replaced by opaque behind-the-border barriers, such as regulatory standards and discriminatory public procurement procedures. What unites these new opaque trade barriers is that, while they have protectionist effects, protectionist intent is extremely hard to prove. It is easy to show that a government illegally raised tariffs, but much harder to prove that it lacked legitimate reasons to adopt, for example, a technical standard that favors domestic suppliers over foreign ones. Without clear evidence of protectionist intent, international institutions may be unable to inform governments of treaty violations. If so, then commitments to refrain from opaque behind-the-border protection may be less credible than commitments to reduce traditional at-the-border barriers.

One particularly opaque form of behind-the-border protection is discrimination in public procurement. Governments that discriminate in procurement systematically favor domestic producers over foreign ones when buying otherwise similar goods or services. In rare cases, such discrimination is explicit, as with the Buy American provisions included in the 2009 US stimulus package, which required that stimulus funds be spent only on American-made manufactured goods. Explicit discrimination is also evident when

² 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.

governments require that foreign suppliers undercut domestic bids by a certain amount. More commonly, however, 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 producers over foreign producers and thus constitute protection of the public procurement market.

Public procurement markets are large; some estimates show procurement can amount to as much as 15 to 20 percent of countries' GDP (Dawar and Evenett 2009). 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). Given the size of procurement markets, it is not surprising that procurement is an increasingly salient issue in international trade negotiations. Governments have tried to minimize discrimination in public procurement in various ways. A handful of GATT members signed a Government Procurement Code in 1981, but this Code applied to very few 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 move by governments to include procurement liberalization in their preferential trade agreements (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 agreements focus primarily on reducing transparent barriers to trade, such as tariffs and quotas. Other agreements are more ambitious and address opaque behind-the-border barriers such as discrimination in government purchases of goods and services. Over time, more and more PTAs seek to prohibit governments from discriminating against foreign bidders when buying goods and services. This trend is evident in Figure 1.

[Figure 1 about here]

Figure 1 shows the number of PTAs entering into force each year that include rules regarding public procurement. To date, 43 PTAs include rules limiting governments’ ability to discriminate against foreign bidders when buying goods and services. These PTAs, which are referred to in the current study as preferential procurement agreements (PPA), have grown more popular over time, with over half entering into force since 2000. PPAs explicitly forbid some or all forms of discrimination in public procurement. Many PPAs 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). Preferential procurement 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, the increasing number of PPAs suggests that governments see international agreements as a potentially fruitful forum for addressing procurement discrimination. However, the actual effectiveness of international procurement agreements is unknown. Do PPAs discourage discriminatory procurement by national governments? In other words, do governments comply with international agreements that limit their ability to discriminate against foreign firms in favour of domestic one when purchasing goods and services?

Transparency, Reputation and Compliance

Governments may sign PPAs with every intention of complying with the rules. Yet, under certain circumstances, it may be rational for governments to renege on their international commitments regarding procurement. During economic downturns, governments may have strong electoral incentives to buy goods and services from domestic producers rather than foreign firms. Buying domestically produced goods may help to stimulate the nation's economy and provide local firms with much needed cash flows. This was, for example, an important part of the logic behind the Buy American provisions included in the 2009 stimulus package.

Governments' commitments to international procurement agreements may therefore lack credibility because of the time-inconsistent preferences of national governments (Simmons and Danner 2010). Governments may renege on preferential procurement agreements in times of economic crisis – despite the fact that the liberalization of

procurement markets brings long-term benefits. Procurement liberalization provides domestic firms with greater access to lucrative foreign procurement markets. Also, greater competition between firms for government contracts gives governments access to cheaper goods and services. To enjoy these gains, however, governments must find a way to make their commitments to competitive procurement credible.

One way to make international commitments credible is to make renegeing on an agreement costly (Simmons and Danner 2010). In theory, preferential procurement agreements may help to make procurement liberalization credible by raising the political costs of noncompliance. If governments adopt reciprocal procurement policies as part of a PPA, a nondiscriminatory equilibrium could emerge even in the absence of centralized enforcement (Axelrod 1984). An important caveat to this claim, however, is that if information is imperfect, “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. Reputational costs raise the incentives for governments to comply with negotiated agreements.

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). Procurement agreements might therefore be expected to similarly constrain government behavior. However, the reputational

mechanism can work only if it is possible to detect and verify treaty violations. Although international agreements exist in part to facilitate such detection, the presence of a treaty alone may not provide enough information to detect and punish noncompliance if treaty violations are inherently hard to observe. Procurement discrimination seems likely to be such a case. As noted earlier, governments can discriminate against foreign producers when purchasing goods and services in myriad ways and most of these measures are opaque. Governments 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 for international procurement agreements is 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 WTO 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 international procurement agreements are grim.

Data and Analysis

To examine the effects of PPAs on procurement discrimination, we first identify preferential trade agreements that include explicit rules limiting government procurement discrimination. We do this for all PTAs notified to the GATT/WTO prior to 2010.³ Using the text of PTA treaties, we identify explicit rules regarding government procurement known as

³ A complete list can be found at <http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx>

“coverage commitments” (Anderson et al. 2010).⁴ Coverage 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 (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.

⁴ 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).

Because such agreements entail no concrete commitments to liberalize procurement markets, they are not considered PPAs in this study.

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.⁵ 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 between the two measures and we find no discordances between the two variables. The conformity between the two measures increases confidence in the validity and reliability of the *PPA* variable.

[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.⁶ Like Figure 1, Table 1 makes clear that PPAs have become increasingly popular. Only two entered into force in the 1980s (Australia-New Zealand and US-Israel) compared with seven in the 1990s, sixteen between

⁵ In a majority of these cases, the provisions on government procurement are based on the WTO Agreement on Government Procurement (GPA).

⁶ 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 .

2000 and 2004, and eighteen between 2005 and 2009.⁷ Why procurement agreements have become more popular is beyond the scope of this paper, but it may reflect the decline in traditional trade barriers, such as tariffs, and the consequent rise in the salience of procurement discrimination. Alternatively, the proliferation of PPAs, like the rise in PTAs more broadly, may reflect disenchantment with the pace of multilateral trade negotiations, which have been deadlocked for the past decade.

Having coded PPA membership, the next step is to measure the effects of PPAs on procurement discrimination in member countries. 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 in favour of domestic producers to different degrees.

⁷ Sometimes a 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.

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 effectiveness of PPAs in reducing procurement discrimination. 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 be higher among signatories 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 of the contestable procurement market (EC 2000; Audet 2002) is government spending on goods and services less compensation of employees and defense expenditures. In 2008, the contestable procurement market in OECD countries amounted to over three trillion dollars. This provides 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:

$$\begin{aligned} \ln(\text{Imports}_{ijt}) = & \beta_0 + \beta_1 \ln(\text{Imports}_{ijt-1}) + \beta_2 \ln(\text{Procurement}_{it}) + \beta_3 \text{PPA}_{ijt} \\ & + \beta_4 \ln(\text{Procurement}_{it}) * \text{PPA}_{ijt} + \beta_5 \text{GPA}_{ijt} + \beta_6 \ln(\text{Procurement}_{it}) * \text{GPA}_{ijt} \\ & + \beta_7 \ln(\text{GDP}_{it} * \text{GDP}_{jt}) + \beta_8 \ln(\text{Population}_{it} * \text{Population}_{jt}) + \beta_9 \text{Trade Taxes}_{it} \\ & + \beta_{10} \text{WTO}_{ijt} + \beta_{11} \text{Joint Democracy}_{ijt} + \beta_{12} \text{PTA}_{ijt} + \beta_{13-28} \text{Year}_t + \varepsilon_{ijt}. \end{aligned}$$

$\ln(\text{Imports}_{ijt})$ 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. 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. $\ln(\text{Procurement}_{it}) * \text{PPA}_{ijt}$, 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 $\ln(\text{Procurement}_{it}) * \text{PPA}_{ijt}$ 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.⁸ We interact this variable with procurement because, like PPA membership, GPA membership should affect the elasticity of imports to spending. $\ln(\text{GDP}_{it} * \text{GDP}_{jt})$ and $\ln(\text{Population}_{it} * \text{Population}_{jt})$ 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). $\text{Joint Democracy}_{ijt}$ 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_{ij} 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.⁹

⁸ 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.

⁹ 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

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 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 follow their example.

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, whether imports-to-spending elasticities increase

are from Tomz, Goldstein and Rivers (2007). Data on GPA, PTA and PPA membership are from the WTO

(<http://www.wto.org/>).

after countries join a PPA. Such a result would provide strong evidence 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 $\ln(\text{Procurement}_{it}) * \text{PPA}_{ijt}$ 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 governments’ propensity to discriminate against foreign suppliers when purchasing goods and services.

Because procurement is interacted with two variables—PPA and GPA membership—a full understanding of the procurement-imports relationship requires further 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 $\ln(\text{Procurement}_{it}) * \text{GPA}_{ijt}$ 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.

The model specification is conservative, particularly the 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 the results: the estimated coefficient on $Procurement_{it}$ 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.¹⁰ 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). 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 generally examines the effects of trade on total government spending (Cameron 1978; Rodrik 1998) or social welfare spending (Rudra 2002; Rudra and Haggard 2005).¹¹ There is 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

¹⁰ Data on alliances and MIDs are available at <http://www.correlatesofwar.org/Datasets.htm> (Accessed December 28, 2009).

¹¹ The nature of the relationship between trade and government spending may be different in rich and poor countries (Rudra 2002; Wibbels 2006) and may depend on regime type (Rudra and Haggard 2005).

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.

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 estimated coefficient on joint democracy is insignificant, consistent with findings reported by Büthe and Milner (2008). It is possible that in our sample there may simply be too few changes in joint democracy to produce noticeable regime effects.¹² 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, Rose's PTA variable includes only ten relatively well-known PTAs, even though, according to the WTO, there are now 219 PTAs in force. Our PTA variable encompasses all of these agreements and thus

¹² Alternatively, regime type may condition the effect of preferential agreements, as suggested by Büthe and Milner (2010). The systematic analysis of the interaction between international and domestic institutions is beyond the scope of this paper.

presumably includes more “failed” PTAs.¹³ This may explain the insignificant coefficient on the PTA variable reported here and underscores the point that not all PTAs have been equally effective in liberalizing trade. This points to the importance of examining the content of preferential trade agreements to examine whether to varied effects PTAs is due, at least in part, to the different rules contained in different PTAs. The current study takes an important step towards this goal by identifying those PTAs that include procurement rules.

Additional 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 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 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

¹³ A similarly comprehensive measure of PTAs is employed by Baccini and Dür (2010).

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]

The elasticity of imports to procurement spending might also depend on the diversification of the local economy. Highly diversified economies offer a wider range of goods and services; governments in such economies therefore have less need to buy goods and services from abroad. Given this, the elasticity of imports to spending should be low when economic diversification is high. PPAs that bar discrimination may be largely irrelevant in non-diversified economies where governments have few opportunities to buy national.

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.¹⁴ 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 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.

[Table 5 about here]

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 $\ln(\text{Procurement}_{it}) * PPA_{ijt}$ 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. When government spending is low,

¹⁴ Output data are from UNIDO's Industrial Statistics Database. Export data are from Feenstra et al. (2004).

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 $\ln(\text{Procurement}_{it}) * PPA_{ijt}$ coefficient is very small and statistically insignificant. The irrelevance of PPAs does not depend on the level of government spending.

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. To explore this possibility, we disaggregate the PPA measure. Preferential procurement agreements are separated 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.¹⁵ We interact each PPA dummy with procurement. Results are presented in Table 6.

¹⁵ 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.

[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.

Conclusion

As traditional trade barriers have fallen, governments have increasingly resorted to less transparent measures to privilege domestic producers, such as discriminatory public procurement. In an effort to control the use of such non-transparent trade barriers, many governments have begun regulating public procurement in preferential trade agreements. For example, many recently concluded PTAs explicitly prohibit government procurement practices that discriminate against foreign producers. In theory, these agreements commit their signatories to open up their procurement markets to competition from other PTA members. The current study demonstrates that the practice, however, is very different. By comparing the elasticity of imports to procurement spending in dyads with and without preferential procurement agreements (PPA), we find that PPAs have failed to discourage discrimination in public procurement. Signatories are no more inclined than non-signatories to spend public funds on imports. An exhaustive series of robustness checks—employing

different model specifications, estimation techniques, samples, and PPA variables—supports this baseline result. In sum, preferential procurement agreements do not reduce discrimination in government purchasing.

This finding suggests an important qualification to theories about the effects of international agreements. Current theory stresses the role of these agreements in providing information and building reputations (Keohane 1984). 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 opaque policy domains, where treaty violations are hard to prove, international agreements are less effective in constraining national governments. For example, if an international agreement 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 the letter of the treaty. 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, the 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 international commitments.

This study 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 opaque trade barriers have become at least as important as more transparent barriers, such as tariffs

and quotas (Henson and Loader 2001). Our results suggest that international treaties may have little effect on these increasingly frequent, 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.¹⁶ Our results suggest that such efforts are worthwhile, insofar as transparency is a *sine qua non* for treaty compliance. The findings reported in this study also suggest, however, that efforts to increase transparency in procurement have thus far not produced the transparency needed to support a workable procurement regime.

¹⁶ 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
$\text{Ln}(\text{Procurement}_{it})$	.105*** (.021)	.121*** (.026)	.119*** (.026)	.112*** (.029)	.105*** (.024)
$\text{Ln}(\text{Procurement}_{it}) * \text{PPA}_{ijt}$	-.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)
$\text{Ln}(\text{Procurement}_{it}) * \text{GPA}_{ijt}$	-.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)
$\text{Ln}(\text{GDP}_{it} * \text{GDP}_{jt})$	.347*** (.051)	.479*** (.063)	.131 (.084)	.167* (.086)	.344*** (.052)
$\text{Ln}(\text{POP}_{it} * \text{POP}_{jt})$	.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)
$\text{Joint Democracy}_{ijt}$	-.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)	
$\text{Ln}(\text{Imports}_{ijt-1})$	.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: $\text{Ln}(\text{Imports}_{ijt})$
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		

Table 4. Conditioning on Economic Development						
Independent Variable	All models OLS with dyad and year fixed effects					
	North-North Dyads		South-South Dyads		North-South Dyads	
	(6)	(7)	(8)	(9)	(10)	(11)
Ln(Procurement _{it})	.043 (.067)	.095 (.128)	.146*** (.026)	.166*** (.031)	-.019 (.036)	-.024 (.048)
Ln(Procurement _{it})*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)
Ln(Procurement _{it})*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)
Ln(GDP _{it} *GDP _{jt})	.433*** (.149)	.656*** (.173)	.189*** (.063)	.263*** (.076)	.688*** (.093)	.968*** (.120)
Ln(POP _{it} *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)
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)
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: Ln(Imports_{ijt})
Robust-cluster standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. Conditioning on Economic Diversification and Spending

Independent Variable	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
Ln(Procurement _{it})	.102*** (.022)	.125 (.086)	.125*** (.044)	.108*** (.024)	.078 (.085)	.036 (.024)
Ln(Procurement _{it})*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)
Ln(Procurement _{it})*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)
Ln(GDP _{it} *GDP _{jt})	.275*** (.063)	.482*** (.102)	.483*** (.064)	.076 (.092)	.291*** (.091)	.493*** (.067)
Ln(POP _{it} *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)
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)
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: 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

