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ABSTRACT

Weak Governments and Trade Agreements*

The recent theoretical literature on the determinants of trade agreements has stressed the importance of political gains, such as credibility, as a rationale for trade agreements. The empirical literature, however, has lagged behind in the estimation of the economic gains or losses associated with these politically motivated trade agreements. This paper fills that gap by providing estimates of the economic impact of politically and economically motivated trade agreements. We find that credibility gains play a role in increasing the probability of two countries signing an agreement. Moreover, agreements with a stronger political motivation are more trade creating than agreements that are signed for pure market access / economic reasons, and the value for the government of solving its time inconsistency problems through trade agreements is estimated at an average of 1.8% of GDP, which compares quite well with the traditional estimates of the economic gains from trade.

JEL Classification: D72, F13 and F15
Keywords: credibility, political economy and trade agreements

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"*Economists have always been aware that the determinants of trade policy are deep down political.*"Dani Rodrik, Handbook of International Economics, vol.3.

1 Introduction

The standard theory of trade agreements (TAs) explains their existence as a way of solving terms-of-trade externalities among large countries (Bagwell and Staiger, 1999). By giving each other reciprocal concessions, countries can internalize terms-of-trade externalities and achieve a more efficient outcome. Thus, even if economists recognize that trade policy at the national level is mainly explained by politics as the above quote from Rodrik (1995) suggests, standard trade theory mainly focused on the internalization of terms-of-trade externalities.

This gap has started to be filled recently as the literature provided new rationales for TAs where internal politics played an important role, and lead to political gains associated with trade agreements. An important contribution in this literature is by Maggi and Rodriguez-Clare (1998) who explain how governments that face time-inconsistency problems in their interactions with domestic lobbies could use the external enforcement provided by TAs to achieve a better outcome. Their idea is simple. In a world where capital is immobile across sectors in the short-run, but mobile in the long-run, the government gets compensated by lobbies in the domestic political game for the static short-run distortions induced by trade protection (the consumption and the mobile factor-induced production inefficiencies). However, it does not get compensated for the long-run capital allocation inefficiencies associated with over-investment in the sector where domestic lobbying is expected to lead to higher levels of protection. If these long-run capital allocation inefficiencies are large relative to the potential static gains derived from the political game by the government, TAs can be used as an external enforcement to credibly commit to trade reform and avoid the long-run misallocation of resources.

There is anecdotal evidence that governments sign trade agreements to lock-in domestic reforms. John Whalley (1998) argued that Mexican negotiators of NAFTA were less concerned to secure an exchange of concessions between them and their negotiating partners,

and were more concerned to make unilateral concessions to larger negotiating partners with whom they had little negotiating leverage. The idea was clearly to help lock in domestic policy reform. Salas and Zabludovksy (2004), two Mexican negotiators, go one step further arguing that NAFTA went beyond lock-in policy reforms by helping create and consolidate institutions that reduced judicial uncertainty and anchored Mexico's trade regime, such as the investor-state dispute settlement mechanism.[1] There is also evidence that the signing of international agreements increase government's credibility, as measured by country-risk ratings. Indeed Dreher and Voigt (2008) correlate country risk ratings with a measure of membership in international organizations, and find a positive and statistically significant correlation, especially in countries with weak governments and institutions.[2]

Our objective in this paper is twofold. First, to provide systematic evidence on whether governments sign trade agreements to solve time-inconsistency problems and boost credibility in government's policies. Second, if this is the case, we want to provide a dollar estimate of the value given by governments to trade agreements that help solve time- inconsistency problems.[3] To answer the first question one could envisage a survey of government officials on their rationale behind signing trade agreements. But the answers are likely to post-rationalize outcome. More importantly, it would leave us without a setup to assess the value that governments may give to solving time-inconsistency issues. Thus, in order to answer both questions we adopt a structural approach that is based on the predictions in Maggi and Rodriguez-Clare's seminal paper.

The two main predictions in Maggi and Rodriguez-Clare (1998) are, first, that incentives to pre-commit through TAs will be stronger in weak governments, defined as those where

[1] In a similar vein, during the failed bilateral trade negotiations between Uruguay and the United States in the mid 2000s, if Uruguay's Foreign Affairs Ministry was reluctant to concede on government procurement, the Ministry of Finance was keen in taking the opportunity offered by the bilateral trade agreement to reform its government procurement policies, using the external enforcement as a policy constraint.

[2] More recently, Liu and Ornelas (2011) show that a larger share of trade coming from FTA partners makes less likely to observe an end to a democratic regime. The reason being that as in Ornelas (2005) the creation of an FTA reduces political rents, and this makes politicians motivated by office rents in less democratic regimes less attracted by staying in office.

[3] This is crucial in understanding why some countries may sign into agreements that hurt them from a strictly market access or terms of trade point of view.

the government's weight, when bargaining with domestic lobbies over political rents, is small. Indeed, if governments can extract most of the lobbying rent from the bargaining game, then there will be little over-investment by producers as they get a small share of the lobbying rent. Second, they predict that pre-commitment through TA will be used by governments which are neither too sensitive nor too unaffected by domestic lobbying. In the former case they would rather extract the lobbying rents, while in the second they do not really need external enforcement.

Importantly, Mitra (2002) shows that Maggi and Rodriguez-Clare's (1998) predictions do not depend on the assumption of lack of capital mobility in the long run, but that they can be obtained in a much more general context. Any model where there is a resource cost incurred prior to lobbying through actions taken in the expectation of successful lobbying in the next stage will lead to this result. Mitra (2002) obtains similar results to the ones in Maggi and Rodriguez-Clare (1998) in a model with perfect capital mobility, but where there are fixed costs associated with lobby formation.

Two more recent papers explain why governments may prefer not to commit to full free trade, but rather to tariff bounds (or preferential trade agreements). Limão and Tovar (2009) explain why commitment to a tariff-bound in TAs[4] can be justified if contributions have a diminishing marginal utility for the government.[5] The reason is again simple. A higher tariff may yield a higher joint surplus in the bargaining game between the government and domestic lobbies. But in the presence of diminishing marginal utility from contributions for the government, this higher tariff that results in higher contributions may actually reduce the share of the government in the total pie. A tariff bound can credibly improve the government's bargaining position and compensate for the fall in the joint surplus. The diminishing marginal utility of lobby contributions to the government could be justified for example by the long-run misallocation of capital in the setup of Maggi and Rodriguez-Clare (1998). Similarly, Maggi and Rodriguez-Clare (2007) found that tariff ceilings will actually be preferred to exact tariff

[4]This is easily linked to WTO's multilateral negotiations, but as we will argue later, it also encompasses bilateral TAs even when what is negotiated involves internal free trade.

[5]See also Drazen and Limão (2008) for a similar result in a more general context.

commitments because the former allow for the lobbying game to continue, and therefore for the government to collect contributions after the TA is signed. This in turn reduces the net return to capital in the "wrong" sector which mitigates the over-investment problem.[6]

In this paper we first build on Maggi and Rodriguez-Clare's (1998) setup to show that if trade agreements need to be self-enforcing, then governments that want to overcome their time-inconsistency problems will sign trade agreements with larger trading partners. Indeed, agreements with larger partners are more likely to be self-enforceable, as they tend to offer larger market access gains and therefore reduce the incentives to deviate from what was originally agreed. We then provide empirical evidence regarding the importance of credibility considerations when signing TAs. We finally explore the potential heterogeneity of the impact of credibility-motivated TAs on trade flows, i.e., are agreements signed for credibility reasons more or less trade-creating? Theoretically one could expect both results. On the one hand credibility may increase (and the long-run misallocation reduced) only in the presence of sufficiently trade-creating TAs, and therefore this will be the type of agreement that governments willing to increase their credibility will sign. On the other hand, too much trade creation may limit the extent to which governments can extract rents from lobbies in the lobbying game as in Limão and Tovar (2009) or Maggi and Rodriguez-Clare (2007), where tariff bounds are preferred by governments to exact tariff commitments.

Results suggest that credibility considerations are an important determinant of preferential TAs. Credibility-driven TAs tend to be signed by governments with low bargaining power vis-à-vis domestic lobbies, and there is a u-shaped relationship between a government's sensitivity to domestic lobbies and the probability of signing a TA, as predicted by Maggi and Rodriguez-Clare (1998). This u-shaped relationship in weak governments is particularly present when governments sign TAs with larger countries. We also find that credibility-motivated TAs tend to lead to more trade creation. Back-of-the-envelope calculations based on the estimates described above suggest that the value of solving time inconsistency through trade agreements is estimated at an average of 1.8% of GDP, which is as large as the traditionally estimated

[6]This is done in a model which allows for both commitment-motivated TAs and terms of trade externalities, and more importantly, which allows for ex-ante lobbying on the government decision to precommit.

static economic gains from trade agreements.

The rest of this article is organized as follows. Section 2 provides a theoretical framework to examine credibility motives for TAs and their impact on trade flows. Section 3 describes the econometric strategy and section 4 discusses the empirical results. Section 5 provides some concluding remarks.

2 Credibility-Driven Trade Agreements

Below we first review the theoretical predictions in Maggi and Rodriguez-Clare (1998) regarding the determinants of credibility-motivated TAs. We then relax the assumption that trade agreements are enforceable and look into determinants of self-enforcement. We then explore predictions in terms of the trade impact of credibility-driven trade agreements.

Assume a 2-sector 2-factor small open economy that cannot influence world prices. On the demand side, assume for simplicity that utility is linear and additive in the numéraire good so as to eliminate any income or substitution effects for the manufacturing good on which we will be focusing. On the supply side, assume that the numéraire sector produces using capital and land which are both in fixed supply (and both normalized to 1) using a constant returns to scale technology. The manufacturing sector produces using capital only with a one-to-one technology. Thus, the marginal productivity of capital is given by the domestic price of the manufactured good, p.

Capital is sector-specific in the short-run, but not in the long-run. We assume that only owners of capital in the manufacturing sector get politically organized to lobby the government for trade protection.[7] They offer the government political contributions in exchange for higher levels of protection. They have mass zero and therefore their share of domestic consumption or lump-sum redistributed tariff revenue is zero. Their objective function is simply given by the returns to capital in the manufacturing sector net of the contributions (per unit of capital, c) they offer the government: $L = (p - c)s_k^m$, where s_k^m is the amount of capital allocated to

[7]Note that we do not allow owners of capital to get organized, and therefore only "short-run" lobbies are part of the political game.

the manufacturing sector.

The government's objective function is a weighted sum of social welfare and lobby contributions where social welfare enters with a weight equal to a, i.e., $V = (1-a)C + aW$. Thus, the larger is a the less sensitive is the government to lobbies' contributions and the more it cares about social welfare when making trade policy decisions.

The timing of the game is as follows. In the first stage, depending on expected returns to capital in the two sectors, owners of capital decide in which sector to invest. In the second stage the government and the manufacturing lobby engage in Nash-bargaining over trade policy, in which government bargaining power is given by σ and lobby bargaining power by $1-\sigma$.

In such a setup there will be over-investment in the manufacturing sector in the first stage if capital owners expect the government to be sensitive to lobby contributions ($a < 1$) in the second stage, and their share of the lobbying game to be sufficiently large (σ not too large). Indeed in such a case they will allocate a larger share of capital to the manufacturing sector than under free trade, and this will create a production distortion for which the government will not get compensated in the second stage. The only compensation the government will get in the second stage is the one associated with the protection-induced consumption distortion. This is illustrated in Figure 1, where the expectation of protection in the second stage induces more investment in the manufacturing sector, shifting the supply curve outwards. This creates a long-run inefficiency that can potentially be much larger than the short-run inefficiencies.[8]

This uncompensated long-run distortion creates incentives for the government to pre-commit to free trade in the first stage even if this implies forgoing the lobby's contributions in the second stage. This will certainly be the case if the bargaining weight of the government is zero ($\sigma = 0$), which implies that the lobby's contributions will only just compensate for the consumption distortion, and leave the government worse-off than if it had pre-committed to free trade in the first stage.

[8]In figure 1 we only illustrate short-run inefficiencies on the consumption side because the short-run supply curve is supposed to be perfectly inelastic.In a more general model, where short-run production is not completely inelastic, the government could also be compensated for the short-run production distortion.

On the other hand, if the government enjoys a sufficiently large share of the joint surplus, then this may compensate for the long-run production distortion and the government will prefer not to commit to free trade and benefit from the large lobby contributions. Actually, if $\sigma = 1$, then there is no over-investment as all of the joint surplus will be captured by the government, and owners of capital in the manufacturing sector will be left indifferent between their lobbying game and the free trade returns ($c = p - c$ and $L = p^* s_k^m$). Thus, there are no incentives for owners of capital to invest in the manufacturing sector beyond the level observed at free trade prices, and therefore no need to precommit.

The first empirical prediction from this model has to do with the relationship between the weight the government grants to social welfare in its objective function, and the value for the government of using a TA as a commitment device, i.e., $G = V^* - V = aW^* - (1-a)C - aW = a(W^* - W) - (1-a)C$. Take the derivative of G with respect to a:

$$G_a = \frac{\partial G}{\partial a} = (W^* - W) - a\frac{\partial W}{\partial a} + C - (1-a)\frac{\partial C}{\partial a} \tag{1}$$

To describe $G(a)$ we proceed in two steps. First, we evaluate G_a at $a = 1$, to obtain $G_a < 0$. To see this note that if $a = 1$ the last term on the right-hand-side of (1) drops out. Also $C = 0$ as the government only cares about social welfare and therefore there is no point in lobbying. This also implies that the welfare level in the lobbying game will be identical to the welfare level under free-trade, i.e., $(W^* = W)$. This implies that when the government already puts a very high weight on social welfare, an increase in a will make commitment through a TA less valuable and therefore less likely. The intuition is simple: if the government already cares a lot (exclusively) about social welfare, then there is no need to use TAs as a commitment device.

Second, we evaluate G_a at $a = 0$, to obtain $G_a > 0$ at least for low values of σ. To see this note that if $a = 0$ the right-hand-side in (1) becomes: $(W^* - W) + C - \partial C/\partial a$. The first two terms are positive, and the last term is negative as (ceteris paribus) contributions will increase with a. However, the increase in contributions will be small if the bargaining weight of the government in the lobbying game is sufficiently small. Indeed, the increase in contributions

will be sufficiently small if σ is small. This implies that $G_a > 0$; when the government puts a very low weight on social welfare and it has a relatively low bargaining weight, an increase in a will make commitment through a TA more valuable and therefore more likely. Thus putting these two results on G_a together we have that when σ is small there is an inverted u-shaped relationship between a and the gains from using a TA as a commitment device.

First prediction: *Trade agreements are more likely to be used as a commitment device in countries with intermediate values of a when governments are weak.*

It is also straightforward to show that if the government is sufficiently strong so that $G_a < 0$ at $a = 0$, then the government will never sign an agreement for credibility reasons. To see this note that $G_\sigma < 0$, so that the probability that a government signs for credibility reason is always smaller for a strong government. Then given that we have $G < 0$ at $a = 0$, i.e., the government prefers not to sign an agreement, and $G_a < 0$ for both low and large values of a, it follows that a sufficiently strong government will never chose to sign a trade agreement regardless of the value of a. This result and the first prediction above are illustrated in Figure 2.

We have assumed so far that TAs are perfectly enforceable, but it is unclear what is the external mechanism that would enforce these agreements at the international level. Governments may be tempted to deviate from their commitments in a previously signed TA if the short-run political gains offered by lobbies outweigh the gains associated with respecting the agreement. And there is very little at the international level to prevent them from doing so. In other words, for the TA to be enforceable there needs to be a high costs of exit. The damage to the international reputation of the country will be one example. Other countries will be reluctant to sign agreements with governments which have not respected their TA obligations in the past. Another is the potential response of the trading partner which will punish the deviation by its partner by withdrawing market access concessions. In this case, lobby contributions may compensate for the short-run inefficiencies associated with higher levels of protection, but may not be sufficiently large to compensate for the losses suffered by

the partner's trade policy response. Indeed the withdrawal of preferences by the partner will be more costly the larger is the partner's market.

In order to show this more formally, in a dynamic setting the incentive compatibility constraint of a trade agreement member suggest that it will stay within the agreement if the gains from participating in it outweighs the gains from deviating:

$$\frac{1}{1-\delta}V^* \geq V + \frac{\delta}{1-\delta}V^N \tag{2}$$

where V^N is the value of the government's objective function when reverting to an equilibrium where it is being punished by its trading partner who deviates to its Nash equilibrium, and δ is the government's discount factor. We can rearrange (2) to obtain:

$$\delta > \delta^{\min} \equiv \frac{V - V^*}{V - V^N} \tag{3}$$

Thus anything that reduces $\delta^{\min}$ will make the participation of the government in the trade agreement more credible. It can be shown that an increase in the size of the trading partner will lead to a reduction of $\delta^{\min}$. Taking the derivative of $\delta^{\min}$ with respect to the size of the partner, denoted s^P yields:

$$\frac{\partial \delta^{\min}}{\partial s^P} = \frac{1}{V - V^P}\frac{\partial \left(V - V^*\right)}{\partial s^P} - \frac{V - V^*}{\left(V - V^N\right)^2}\frac{\partial \left(V - V^N\right)}{\partial s^P} \tag{4}$$

Recall that $V - V^* = -G = (1+a)\,C - a\,(W^* - W)$. Then note that neither lobbies contributions or social welfare are affected by the partner's size when the government decides to deviate from the agreement. Indeed, partner's size is irrelevant if the agreement is not enforced by the government. Thus, $\partial \left(V - V^*\right)/\partial s^P = -a\partial W^*/\partial s`P < 0$, as social welfare increases as the trade agreement is signed with a larger trading partner (everything else equal).[9] Thus, through this channel an increase in the partner's size will make the trade agreement more credible. Similarly $-\partial \left(V - V^N\right)/\partial s^P = \partial V^N/\partial s^P < 0$. Indeed, the larger is the trading partner which will punish the domestic country by deviating to its Nash trade

[9]See Schiff (1997).

policy strategy, the smaller will be the value of the government's objective function. Replacing these results into (4) yields:

Second prediction: *Trade agreements are more likely to be used as commitment devices when countries sign agreements with relatively large partners.*

We finally turn to the impact of credibility-driven TAs on trade flows: are they likely to lead to more or less trade creation? Or put otherwise, are countries seeking to use TAs as a commitment device more likely to sign agreements with partners that will lead to more trade creation? In order to address this question assume that there are two potential partners with which the domestic government could sign a TA: if signed with partner A then the agreement is fully trade-creating and will lead to the same level of investment in the manufacturing sector as under free trade. If the agreement is signed with partner B there will be some trade-diversion in the Lipsey (1960) sense, which will generate over-investment in the domestic manufacturing sector, as prices will be above free trade prices.

The trade-off for the domestic government is then quite simple. The TA with partner A will result in the socially optimal level of investment in the manufacturing sector, but there will be no contributions from lobbies left, as there will be nothing to bargain over. The TA with partner B, on the other hand, will allow for over-investment in the manufacturing sector, although not as large as under no commitment. Thus the long-run misallocation of resources for which the government is not compensated will be smaller than under no commitment, but larger than if the TA is signed with country A. On the other hand, the agreement with B will allow the government to receive contributions in the second stage, making it more attractive than the agreement with A. In other words a less trade-creating agreement will reduce the size of the pie, but may increase the government's share of this pie and therefore may be more attractive than a pure trade-creating agreement where a government's lobbying rents are forgone. Thus, it seems that whether credibility-driven TAs are more or less trade creating is an empirical question.

Interestingly, it can be shown that those trade agreements that are likely to be more trade-

creating are those where governments are really weak and with more intermediate values of a. Indeed, as argued earlier, $V^A = aW^a > V = (1-a)C + aW$ [10] when σ is sufficiently small and a neither too small, nor too large. The same reasoning will apply when comparing V^B to V. The trade agreement with country B will be signed only if σ is sufficiently small, so that not too much weight is given to the forgone contribution, and also when a is neither too large, nor to small, so that there is an economic rationale for the agreement.

In order to determine whether the government will prefer an agreement with partner A rather than B, let us apply the same type of logic as in Maggi and Rodriguez-Clare (1988). An agreement with A will be preferable if:

$$V^A > V^B \Leftrightarrow a(W^A - W^B) - (1-a)C^B \equiv G^{A-B} > 0 \tag{5}$$

It is then straightforward to apply the same reasoning we did earlier regarding equation (1) to show that an agreement with A will be preferred in countries with weaker governments and more intermediate values of a. Thus, the more important is the time-inconsistency problem faced by the government, the more likely it will sign a more trade creating agreement. Note, however, that one cannot rule out that a less trade-creating agreement with partner B may be preferred by a government with less serious credibility problems.

3 Empirical framework

We proceed in two steps. We first estimate the two predictions of the previous section regarding the determinants of credibility- driven TAs and build a measure of credibility motives behind the signing of each agreement. In the second step we test whether the impact of TAs on imports varies depending on whether credibility was an important force behind the signing of the agreement.

[10] where V is here the value of the government's objective function in the absence of a trade agreement, and V^A the value of the trade agreement with A)

3.1 Testing the credibility motivation

We investigate whether, controlling for market access reasons and the political affinity between two countries, credibility motivations influence the probability of those countries signing an agreement.

Building on the specification used by Baier and Bergstrand (2004 and 2007) or Egger et al. (2009) to explain trade agreements, we add the credibility determinants suggested by the two predictions above. The basic reduced-form equation to be estimated is then:

$$\begin{aligned} \mathrm{TA}_{ijt} &= \beta_0 + \beta_1\, a_{it} + \beta_2\, a_{it}^2 + \beta_3(1-\sigma_{it}) * a_{it} + \\ &\quad \beta_4(1-\sigma_{it}) * a_{it}^2 + \beta_5(1-\sigma_{it}) + \beta_6 \mathrm{RS}_{ijt} + \beta_7 \mathrm{RS}_{ijt} * (1-\sigma_{it}) * a_{it} \\ &\quad + \beta_8 \mathrm{RS}_{ijt} * (1-\sigma_{it}) * a_{it}^2 + \beta_9 \mathrm{MS}_{jt} + \beta_{10} \mathrm{DMS}_{ijt} + \beta_{11} \mathrm{AI}_{ijt} + \beta_{ij} + e_{ijt} \end{aligned} \quad (6)$$

where TA_{ijt} is a binary variable indicating whether countries i and j have a trade agreement at time t; β's are parameters to be estimated and β_{ij} are country-pair fixed effects to control for anything that is country-pair specific such as distance, colonial links, a common border, differences in Capital-Labor ratios and in real GDPs in the initial year as in Baier and Bergstrand (2004) etc; a_{it} is the weight the government of country i grants to domestic aggregate welfare at time t, and $1-\sigma$ is a measure of this government's relative weakness in the bargaining game with lobbies at time t. Below we describe how these two determinants of credibility-driven TAs are measured. Note that a enters in a quadratic form and is interacted with $1-\sigma$ as suggested by the first prediction; moreover, a (a^2) and $1-\sigma$ are interacted with RS which captures the relative size of j's market with respect to i's market (following the second prediction). MS is the market size of country j at time t as in Meyer (2009),[11] DMS is the absolute value of the difference in market size between countries i and j at time t and AI is the Affinity Index between the two countries at time t, as in Baier and Bergstrand (2007); e is the error term. The Data Appendix and Table A3 with Summary Statistics provide more

[11] We also use GDP as a robustness check.

information on those variables.

Because our dependent variable is binary, we use a conditional ML estimation appropriate for the panel logit model with country-pair fixed effects.[12]

The first prediction implies $\beta_3 > 0$ and $\beta_4 < 0$ and the second prediction implies $\beta_7 > 0$ and $\beta_8 < 0$. In the next section we describe how we measure a government's welfare mindedness (a) and bargaining strength/weakness (σ).

3.1.1 Measuring Government's welfare mindedness

Governments' welfare mindedness (a) is estimated using the methodology presented in Gawande et al (2009) based on the Grossman-Helpman "Protection for Sale" (1994) setting. In this model, the existing level of tariffs in a country is the result of government - which values both its population's welfare and the contribution it receives from import-competing domestic producers - and lobbies maximizing their own objective functions. The first order condition associated with the government's maximization in the second stage of the Nash game can be written as follows[13]:

$$\frac{t_{its}}{1+t_{its}} = \frac{1-a_{it}}{a_{it}} \frac{y_{its}}{m_{its}\varepsilon_{is}} \tag{7}$$

where t_{its} is the MFN tariff in country i at time t in sector s, y is domestic production, m are imports, and ε is the absolute value of the import demand elasticity. The country and time-varying parameter a_{it} can be estimated using the cross-sector variation of equation (7). Note that some of the right-hand-side variables suffer from endogeneity bias of measurement error (e.g elasticities are estimates provided in Kee, Nicita and Olarreaga (2009)). One solution is to rewrite (7) as

$$\frac{t_{its}}{1+t_{its}} \frac{\varepsilon_{is} m_{its}}{y_{its}} = \frac{1-a_{it}}{a_{it}} = \theta_{it} \tag{8}$$

[12]Fixed effects estimation is possible for the panel logit model, but not for other binary panel models such as probit due to the incidental parameters problem (Cameron and Trivedi, 2005).The bias if we were to use a probit estimation will be relatively important when t is small relative to ij, which is the case here as t is around 10 and ij around 10,000. This is not the case in other setups such as Egger et al (2009).

[13]We assume that all s sectors which are import-competing are politically organized.

We use a stochastic version of this equation to estimate $\theta_{it} = (1 - a_{it})/a_{it}$: we calculate the LHS of equation (8) and regress it on country-pair dummies. Using this estimate we then retrieve a which varies by country and year; it is given by $a_{it} = 1/(1 + \theta_{it})$.Our estimates of a vary between 0 and 1, and reflect the importance a government attributes to aggregate welfare relative to the contributions it receives from domestic groups (in a trade setup). The higher is a, the higher is the government's welfare mindedness.

The estimates of a are displayed in Table A1 of the Appendix. The lowest a's belong to Ethiopia and Bangladesh. In general, richer countries and large middle-income countries have higher a, such as Singapore and Japan. Countries with lower a are also among the most corrupt: the Spearman rank correlation between our estimates of a and the 2005 Corruption Perception Index from Transparency International is 0.52.

Equation (8) shows that the estimates of a not only depend on the level of tariffs, but also on the import-penetration ratio (m/y) and import demand elasticities, their covariance with tariffs and with each other. As Gawande et al (2009) note, the incidence of tariffs in industries with high import demand elasticities reveals the willingness of governments to trade aggregate welfare for contributions (low a). The incidence of tariffs in industries with high import-penetration ratios reveals the same, since distorting prices in those sectors creates large deadweight losses. As such, it is not surprising that the correlation between the estimates of a and average tariff is relatively low (-0.32).

Table 1 indicates how our estimates of a_{it} correlate with different measures of corruption such as the Corruption Perception Index, the number of parking violations by diplomats (from Fisman and Miguel, 2007), the corruption index from the World Bank Governance Indicators database (Kauffman, Kraay and Mastruzzi, 2009), and average tariffs and GDP per capita. All coefficients have the expected signs: corrupt countries are associated with lower as, as well as countries with higher average tariffs. Richer countries have higher as.

3.1.2 Measuring government's bargaining weight

In order to estimate the government's bargaining weight σ, define the contribution that the lobby offers the government in the second-stage of the game to obtain a certain level of protection. Under Nash bargaining the contribution is a weighted sum of the welfare loss incurred by the government and the lobby's willingness to pay for protection:

$$C = (1-\sigma)\left[\frac{a}{1-a}\left(W^* - W\right)\right] + \sigma\left[\left(p - p^*\right)y\right] \tag{9}$$

The first term in square brackets is the value of the welfare loss for the government associated with a given level of protection relative to a dollar of contribution, and the second term is the value for the lobby of obtaining a given level of protection. If the government's bargaining weight is close to 1, then the government will get all the rents away from the lobbies. If the government is weak ($\sigma = 0$), then it will only be left indifferent with respect to its level of welfare under free-trade.

Taking the derivative of (9) with respect to tariffs, recalling that the level of production is fixed in this second stage by assumption, and then using the first order condition of the government's maximization problem[14] we obtain:[15]

$$\frac{\Omega_{its}}{2-\Omega_{its}} = \sigma_{it} \qquad \text{where} \quad \Omega_{its} = \frac{a_{it}}{1-a_{it}}\frac{t_{its}}{1+t_{its}}\frac{m_{its}}{y_{its}}\varepsilon_{its} \tag{10}$$

We then estimate σ_{it} using a stochastic version of (10) for each country and year. Table A2 of the Appendix presents the average estimates of $1-\sigma$ (government's weakness/lobby's strength) by country, with an overall mean of .86. This relatively large bargaining weight for lobbies vis à vis governments is in accordance with the assumption of the Grossman and Helpman (1994) model, where lobbies are assumed to capture all the rents from the lobbying game.

The five countries with the strongest governments (in terms of share of lobbying rents cap-

[14] If the government's FOC is satisfied then $\partial C/\partial t = -a/(1-a) * dW/dt$, where $dW/dt = -\varepsilon m t/(1+t)$.

[15] The welfare loss is linearly approximated by the Harberger triangle, i.e., $W^* - W = 1/2 * \Delta m * t = 1/2 * m * \varepsilon * t/(1+t)$.

tured by the government) are Bangladesh, Trinidad-Tobago, Venezuela, India and Thailand. The five countries with weakest governments are Sweden, Ethiopia, Singapore, Australia and France. We examine how our estimates correlate with a number of political variables from the World Bank's Political Institutions Database (Beck et al. 2001, 2008) and results are presented in Table 2. The only statistically significant result we obtained is for the Government Herfindhal index (the sum of squares of the share of seats in the government by each political party) which correlates positively with the bargaining weight of the government, suggesting that governments which are more concentrated tend to be stronger when bargaining over lobbying rents.[16]

3.1.3 How important are credibility motivations?

Using the estimates from the conditional ML of (6) we can then predict the likelihood of observing a trade agreement between two partners at time t:

$$P_{ijt} = \frac{\exp^{\mathbf{x}'\beta}}{\sum_l \exp^{\mathbf{x}'\beta}} \tag{11}$$

where l represents a country-pair and the denominator is therefore a constant within a country-pair. The probability model used in the conditional logit is not the unconditional probability $P(Y = 1|X)$, but the probability of a positive outcome conditional on one positive outcome in the country-pair group. As such, the underlying model has a different intercept for each group.

To differentiate between credibility and market-access driven TAs, we calculate the predicted probability of a positive outcome considering only explanatory variables associated with the credibility argument (the triple interactions of a , $(1-\sigma)$ and the relative size of country j with respect to i), which we call P^c henceforth:

$$P^c_{ijt} = \frac{\exp^{\mathbf{x}^{\mathbf{c}\prime}\beta}}{\sum_l \exp^{\mathbf{x}^{\mathbf{c}\prime}\beta}} \tag{12}$$

[16]Note that there is no correlation between the estimates of a in the previous subsection and the estimates of σ. The correlation coefficient is 0.04.

How does the probability that an agreement gets signed for credibility reasons vary by region? Using equation (12) we estimated P^c_{ijt} for different types of agreements. Results are reported in Table 3. South-North agreements have a higher P^c on average than all other types of agreements (24%), followed by South-South agreements (23%), North-South (16%) and North-North agreements (14%). Developing countries are more likely to sign trade agreements for credibility reasons.

3.2 Do credibility-driven TAs affect trade differently?

We are now able to analyze the impact of credibility-driven TAs on bilateral flows using P^c. To disentangle whether there is heterogeneity in the way credibility-motivated TAs affect imports we turn to the workhorse of the trade literature: the gravity equation. In order to control for the same variables as in the most recent work on the impact of TAs on bilateral trade flows, we introduce country-pair specific fixed effects. This controls for bilateral distance, colonial linkages, a common border or any other geographical or time-invariant institutional determinant of bilateral flows (see Carrere, 2006 or Baier and Bergstrand, 2007 or 2009).

We also use alternative gravity specifications. In a second specification we introduce time*exporter dummies to control for general equilibrium effects such as those affecting trade flows through exporter-country price indices (see Baier and Bergstrand, 2007 or Egger et al., 2009).[17] We also estimate a more traditional gravity specification controlling for distance, common language and remoteness as in Carrere (2006). More formally, the following specifi-

[17]Note that time*importer effects are not included since our variable of interest (P^c_{ijt} , interacted with the RTA dummy) depends on importer's characteristics.

cations were estimated:

$$\begin{aligned}
\ln(m_{ijt}) &= \alpha_0 + \alpha_1 \mathrm{T}A_{ijt} + \alpha_2 \mathrm{TA}_{ijt} * \ P^c_{ijt} + \alpha_3 \ P^c_{ijt} + \alpha_4 \mathrm{lnGDP}_{it} + \alpha_5 \mathrm{lnGDP}_{jt} \\
&\quad + \alpha_{ij} + \alpha_t + u_{ijt} \qquad (13) \\
\ln(m_{ijt}) &= \alpha_0 + \alpha_1 \mathrm{T}A_{ijt} + \alpha_2 \mathrm{TA}_{ijt} * \ P^c_{ijt} + \alpha_3 \ P^c_{ijt} + \alpha_{ij} + \alpha_4 \mathrm{lnGDP}_{it} + \alpha_{jt} + u_{ijt} \qquad (14) \\
\ln(m_{ijt}) &= \alpha_0 + \alpha_1 \mathrm{T}A_{ijt} + \alpha_2 \mathrm{TA}_{ijt} * \ P^c_{ijt} + \alpha_3 \ P^c_{ijt} + \alpha_4 \mathrm{lnGDP}_{it} + \alpha_5 \mathrm{lnGDP}_{jt} \\
&\quad + \alpha_6 \text{Common Language} + \alpha_7 \text{Log Inverse Distance} + \alpha_8 \text{Remoteness} + u_{ijt} \qquad (15)
\end{aligned}$$

where the αs are parameters to be estimated, m_{ijt} are country $i's$ imports from country j at time t, TA_{ijt} is a dummy indicating whether countries i and j have a trade agreement at time t, α_{ij} are country-pair dummies, α_t are time dummies, α_{jt} are exporter-year dummies, P^c_{ijt} is the predicted probability of signing a TA for credibility reasons, as defined in the previous section, and u_{ijt} is an error term.

The sign of α_2 determines whether credibility-driven trade agreements are more or less trade-creating: if $\alpha_2 > 0$ then credibility-driven trade agreements are more trade-creating, and if $\alpha_2 < 0$, credibility-driven trade agreements are less trade-creating.

We estimate those specifications using OLS and Negative Binomial(NB) where the later take the presence of zeros in the bilateral trade data into account, following the recent empirical literature on the estimation of gravity models. As Santos Silva and Tenreyro (2006) recommend, we estimate the gravity equation in levels using the proposed Pseudo-Maximum Likelihood estimator. Because the assumption of equidispersion does not hold, the Poisson PML does not take full account of the heteroscedasticity in the model, and therefore we use the Negative Binomial estimator, which is more general than the Poisson model (Cameron e Trivedi,2005).

4 Results

Table 4 presents the results of the effect of credibility motivations on the formation of TAs between two countries. More specifically, we test the two predictions from the extended Maggi and Rodriguez-Clare model of section 2.

The first prediction - TAs are more likely to be used as a commitment device in countries with intermediate values of a when governments are weak - is confirmed by our estimates of β_3 and β_4, which are both statistically significant. The second prediction is also confirmed: the signs of the coefficients for the interactions $\text{RS}_{ijt} * (1 - \sigma_{it}) * a_{it}$ and $\text{RS}_{ijt} * (1 - \sigma_{it}) * a_{it}^2$ confirm that a TA is more likely to be used as a commitment device when countries sign agreements with relatively larger partners.

In column III of Table 4 we correct our estimates of a_{it} and σ_{it} for the fact that themselves have been estimated (a_{it} and σ_{it} are generated regressors). To minimize the measurement error bias in the estimation of equation (6), we apply the error correction suggested by Fuller (1987) and Gawande (1997). Given that a_{it} is estimated with a measurement error equal to u_{it} and standard error σ_{uit}, the corrected a_{it} (or $\widetilde{a_{it}}$) is then:[18]

$$\widetilde{a_{it}} = \overline{a} + \frac{\sigma_a^2 - \overline{\sigma_u^2}}{\sigma_{uit}^2}(a_{it} - \overline{a}) \tag{16}$$

where $\overline{a}$ and σ_a^2 are the sample mean and variance of a, respectively. It can readily be seen from the formula that a_{it} is measured without error ($\widetilde{a_{it}}$=a_{it}) whenever the variance of the measurement error of one observation is equal to the difference between the sample variance of a_{it} and the mean variance of u_{it} (i.e when the fraction above = 1). If the denominator is large, $\widetilde{a_{it}}$ is approximated by the sample mean of a ($\overline{a}$); and if the sample variance of a_{it} is large relative to the measurement error (the numerator), $\widetilde{a_{it}}$ is approximated by the estimated a_{it}. Results of the estimation of equation (6) using $\widetilde{a_{it}}$ and $\widetilde{\sigma_{it}}$ do not change significantly, as can be seen in column 3 of Table 4.

Table 5 provides OLS estimates showing that the inverted u-shaped relationship is obtained

[18] A similar correction is undertaken for σ_{it} in column 3 of Table 4.

using a linear probability model as well. The turning point using the conditional logit estimates occurs for values of $a = 0.8$, i.e., when the weight given to social welfare in the government's objective function is 4 times larger than the weight given to political contributions.

We revert to Table 6 to examine the impact of credibility-driven TAs on the trade flows between pairs of countries. In both gravity specifications (with country-pair and time fixed effects; and exporter-year and country-pair fixed effects), the coefficient on the interaction TA*P^c is insignificant, suggesting no particular effect of credibility-driven TAs on trade flows between the pair of countries. Nevertheless, once we account for the presence of zeros in the trade matrix and estimate the gravity equation with Negative Binomial ML as in column V of Table 6, we find that credibility-driven TAs are trade creating. The likelihood-ratio test of $H_0 : \alpha = 0$ rejects the null hypothesis that the variance function parameter of the NB model is 0 i.e there is overdispersion in the data and therefore the NB model is preferred to the Poisson ML(Cameron e Trivedi, 2005).

4.1 The value of trade agreements

Using those estimated we can provide an estimate of the value that governments grant to TAs that are signed for credibility reasons. Indeed our estimates suggest that an agreement that is signed for credibility reasons leads to an increase in imports that is 7% larger than if the agreement is signed for other reasons. This implies that the government is willing to give up a certain amount of lobbying contributions for credibility reasons.[19] Using the expression in (9) and our estimates of a and σ we can estimate the loss in contributions that the government is willing to incur to sign for credibility reasons. To do so, first note that we can translate the additional change in imports into a price effect using import demand elasticities, i.e., $\Delta p = (p/\varepsilon) \cdot \Delta m/m$. Then differentiating (9) with respect to prices we obtain:

$$\Delta C = -(1-\sigma)\frac{a}{1-a} \cdot \Delta W + \sigma \Delta p \cdot y \tag{17}$$

[19]Ideally what we would like to measure is the production inefficiency associated with the absence of commitment, but this is something for which we have no data.

where ΔW can be linearly approximated by the Harberger triangle as $1/2 \cdot \Delta m \mid \Delta p \mid$. Substituting the change in prices above into the change in welfare expression and into (17) it can be rearranged as:

$$\frac{\Delta C}{py} = -\frac{1}{\mid \varepsilon \mid}\frac{\Delta m}{m}\left(\sigma + \frac{1}{2}(1-\sigma)\frac{a}{1-a}\frac{\Delta m}{m}\frac{m}{y}\right) \tag{18}$$

Equation (18) suggests that the more elastic is import demand, the smaller is the loss in contributions as a share of total production for a given percentage change in imports. The reason is simple. A more elastic import demand implies that domestic demand is very elastic and therefore the change in domestic prices following the change in imports should not be too large, which will not lead to a large decline in producer surplus and therefore contributions. On the other hand, the larger is a,the larger is the loss in contributions that the government is willing to endure to solve its time-inconsistency problems. Finally, an increase in the bargaining weight that the government has will increase the value for the government of signing a trade agreement unless a is very large: with an increase in imports of 7% and assuming an imports to output ratio of 50%, a needs to be larger than 0.987 for the loss in contributions to decline with σ. It is important to note at this point that the fact that the probability of the agreement being signed is low does not affect the potential value of the agreement. For example, if a is large, the agreement will be valuable for the government because it increases welfare. Similarly, if σ is 0, the government has strong incentives to sign for credibility reasons because it does not get anything from the lobbying game, but the value of the trade agreement is also likely to be small because there is not much to lose in terms of political contributions.

Expression (18) can then be computed for every country at the sample mean and the results are reported in Table A4 of the Appendix. Our estimates suggests that to sign for credibility reasons governments may be willing to forgone on average around 1.8% of the value of production (or GDP given the model's assumptions) in lobbies contributions.[20] Countries

[20]To calculate the value of trade agreements per credibility reason in each country we used the import to output ratios per country.

where the value of trade agreements signed for credibility reasons is higher are Bangladesh and Trinidad-Tobago, where the value of the trade agreement signed for credibility reasons could represent ca 4% of GDP. Countries where the value for the government of trade agreements signed for credibility reasons is likely to be small are Ethiopia and Bolivia where the gains represent less than 0.1% of GDP (for Ethiopia). The heterogeneity across countries is explained by differences in import demand elasticities, import to output ratios, σs and as.

5 Concluding remarks

We provided empirical evidence regarding the importance of credibility considerations when signing TAs based on the theoretical predictions of Maggi and Rodriguez-Clare (1998). Results suggest that credibility-driven TAs tend to be signed by governments with low bargaining power vis-à-vis domestic lobbies, and that there is a u-shaped relationship between government's sensitivity to domestic lobby and the probability of signing a TA, in particular when the partner is relatively large. Interestingly, credibility considerations tend to be a stronger determinant of TA when these are signed by developing countries regardless of whether the partner is a developed or a developing country (as long as the partner is relatively larger).We also found that credibility-motivated TAs tend to lead to more trade creation. The value of trade agreements signed for credibility reasons vary depending on the weight government's give to social welfare in their objective function and their bargaining power when sharing political rents with lobbies. On average they represent 1.8% of GDP.

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Data Appendix

We use the Preferential Trade Agreements Database from the Peterson Institute for International Economics and the World Trade Institute (WTI), constructed using the notifications of the date the agreements entered into force. The database contains 570 agreements in the period 1948 - 2007; of these, 329 agreements were still in force in 2007. A total of 1319 country-pair trade deals are registered up to 2000, but just 1134 are still in force or signed for later implementation. That means that around 11% of the pairs of countries are covered by some sort of trade agreement in the year 2000. Among these agreements, 65% are classified as pure Free Trade Agreements (FTAs), and the others are partial scope agreements, currency unions and others. For our analysis we will use all types of registered agreements. We limit the period of investigation to 1988-2000 due to the availability of data on trade, production and protection by sector (Nicita and Olarreaga, 2006)used to construct a and σ (government's welfare-mindedness and bargaining weight vis à vis lobbies, respectively). We have 6026 country-pairs in the final sample (where a and σ are not missing values for at least 1 year).

Data on the Real Market Potential of countries, which we use to proxy for market size, is from Mayer (2007). The Affinity of Nations Index (1946-2002) that measures the interest similarity between pairs of countries based on the votes in the United Nations General Assembly is from Gartzke (2006). All politically-related data (the margin of majority of the government in Congress, the Herfindhal measure of concentration of Government parties in Congress, whether a country has a Finite Term for its government etc) come from the World Bank database of Political Institutions (Beck, Keefer and Clarke, 2001). The Corruption Perception Index is from Transparency International, the Corruption Index from the Worldwide Governance Indicators Database (Kauffman, Kraay and Mastruzzi, 2009) and the parking violations by diplomats from Fismel e Miguel (2007). Bilateral import data is from the United Nations Commodity Trade Statistics Database - COMTRADE (SITC classification revision 1), and data on GDP and GDP per capita from the World Development Indicators (WDI). Table A3 of the Appendix contains summary of statistics for all variables used.

Table 1: Government's Welfare Mindedness a_{it}

	(I)	(II)	(III)	(IV)	(V)	(VI)
CPI 2005	0.00894***					0.0422***
	(0.000879)					(0.00728)
Diplomatic violations		-0.000644**				0.00171***
		(0.000307)				(0.000324)
Corruption WB			0.155***			-0.584***
			(0.0153)			(0.0760)
Average tariff				-0.00182***		-0.00180***
				(0.000371)		(0.000389)
Log of GDP per capita					0.0875**	0.0623*
					(0.0343)	(0.0337)
Constant	0.467***	0.896***	0.644***	0.993***	0.0173	-0.768***
	(0.0400)	(0.0398)	(0.0314)	(0.0343)	(0.341)	(0.111)
Observations	290	279	290	290	287	279
R-squared	0.939	0.938	0.939	0.945	0.940	0.945

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

All regressions are estimated using OLS with country and year fixed effects.

Table 2: Government's bargaining weight σ

	(I)	(II)	(III)	(IV)	(V)
Finite Term	0.123				0.109
	(0.198)				(0.209)
Herfindahl Government		0.261**			0.271**
		(0.105)			(0.113)
Margin of Opposition			0.0309		-0.0986
			(0.154)		(0.168)
Log of GDP per capita				0.196	0.284
				(0.217)	(0.279)
Constant	0.0262	-0.277	0.103	-1.956	-1.575
	(0.255)	(0.283)	(0.260)	(2.162)	(1.440)
Observations	260	260	281	287	251
R-squared	0.296	0.317	0.292	0.296	0.319

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

OLS regressions include country and year fixed effects

Table 3: Summary Statistics of P^c by type of agreement

North-North TAs							
obs	mean	sd	max	min	p25	p50	p75
2264	.1422	.3448	1	0	0	0	2.09e-14
South-South TAs							
obs	mean	sd	max	min	p25	p50	p75
9592	.2328	.4211	1	0	0	0	.0021
North-South TAs							
obs	mean	sd	max	min	p25	p50	p75
6236	.1622	.3658	.9856	.0	0	0	3.76e-32
South-North TAs							
obs	mean	sd	max	min	p25	p50	p75
1905	.2382	.4118	1	0	0	0	.0174
All agreements							
obs	mean	sd	max	min	p25	p50	p75
19997	.2011	.3978	1	0	0	0	1.78e-10

Table 4: The effect of credibility on TA formation, 1988-2000

TA=1 or 0	(I)	(II)	(III) Gawande/Fuller correction of M.E
Welfare mindedness (a)	85.12***	-426.7**	-716.62
	(25.24)	(200.4)	(460.54)
Welfare mindedness-squared (a^2)	-56.30***	228.5**	377.75
	(15.37)	(115.7)	(257.74)
Government's weakness ($1-\sigma$)		-331.5***	-396.49*
		(111.9)	(224.36)
a*($1-\sigma$)		734.8***	820.83
		(254.8)	(500.9)
a^2*($1-\sigma$)		-406.8***	-426.12
		(144.7)	(279.18)
Relative size (j/i)(RS)		263.4***	688.16**
		(97.88)	(648.20)
a*($1-\sigma$)*RS		773.4***	1720.11**
		(243.0)	(316.2)
a^2*($1-\sigma$)*RS		-433.7***	-964.86**
		(135.7)	(357.16)
a*RS		-600.5***	-1550.18**
		(218.8)	(608.06)
a^2*RS		340.0***	869.99**
		(122.3)	(335.96)
($1-\sigma$)*RS		-343.9***	-764.92**
		(108.7)	(293.93)
Market size of partner (MS_j)	3.41e-05***	4.55e-05**	.000036**
	(1.24e-05)	(1.83e-05)	(.000016)
Abs. value of size difference (DMS)	286.2**	325.3**	386.87***
	(139.0)	(152.7)	(154.29)
UN Affinity Index (AI)	1.902*	2.510**	3.966***
	(1.083)	(1.121)	(1.076)
Observations	936	936	936

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

All regressions are estimated using a ML conditional logit which controls for time-invariant country-pair specific unobservables.

Table 5: The effect of credibility on TA formation, 1988-2000 (OLS estimates

	(I)	(II)
Welfare mindedness (a)	15.91***	-10.49
	(5.133)	(23.88)
Welfare mindedness-squared (a^2)	-10.30***	3.761
	(3.092)	(14.09)
Government's weakness ($1-\sigma$)		-18.94*
		(11.36)
a*$(1-\sigma)$		41.37
		(26.98)
a^2*$(1-\sigma)$		-22.67
		(15.87)
Relative size (j/i)(RS)		19.90**
		(7.907)
a*$(1-\sigma)$*RS		52.95***
		(20.07)
a^2*$(1-\sigma)$*RS		-30.43**
		(11.81)
a*RS		-47.46**
		(18.73)
a^2*RS		27.72**
		(11.02)
$(1-\sigma)$*RS		-22.92***
		(8.459)
Market size of partner (MS_j)	2.70e-09**	1.69e-09
	(1.23e-09)	(1.22e-09)
Abs. value of size difference (DMS)	0.0760***	0.0721***
	(0.0271)	(0.0263)
UN Affinity Index (AI)	0.217	0.521***
	(0.184)	(0.192)
Constant	-6.789***	5.587
Observations	936	936
R-squared	0.057	0.133
Number of country-pairs	138	138

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

All regressions include country-pair fixed effects.

Table 6: The impact of credibility-driven TAs on imports

	(I)	(II)	(III)	(IV)	(V)
Log of Imports					Imports
Log of GDP (i)	1.247***	1.245***	1.279***	0.861***	0.134***
	(0.125)	(0.125)	(0.125)	(0.0219)	(0.00761)
Log of GDP (j)	1.1999***	1.2018***		1.2173***	0.458***
	(0.191)	(0.118)		(0.016)	(0.00613)
TA	0.309***	0.307***	0.284***	0.303***	0.600***
	(0.0822)	(0.0826)	(0.0880)	(0.0705)	(0.0281)
P^c		-0.00638	-0.0270	-0.0391	-0.0809***
		(0.0251)	(0.0270)	(0.0255)	(0.0158)
TA*P^c		0.0124	0.0281	0.0644	0.0739**
		(0.0642)	(0.0658)	(0.0620)	(0.0303)
Common Language				0.670***	
				(0.0913)	
Log Inverse of Distance				1.194***	
				(0.0557)	
Remoteness				-0.00716	
				(0.0133)	
Constant	-51.88***	-51.89***	-24.01***	-32.88***	-14.78***
	(4.233)	(4.235)	(3.168)	(0.828)	(0.236)
Observations	17920	17920	17920	15049	18,716
R-squared	0.089	0.089	0.941	0.7211	
Number of country-pairs	3724	3724		2936	3256

Bootstrapped Standard errors in parentheses, for columns I-IV. *** p<0.01, ** p<0.05, * p<0.1

OLS regressions in columns I and II have country-pair and year fixed effects.

OLS regression in column III has exporter-year and country-pair fixed effects,

and column IV has year fixed effects.

Conditional FE Negative Binomial regression in column V has country-pair and year fixed effects.

Appendix

Table A1: Estimates of Government's welfare mindedness a

Country	a	St.Dev	Dev.from overall mean
Japan	.9878	.0017	.1265
Italy	.9819	.0051	.1206
Brazil	.9799	.0044	.1186
Romania	.9785	.	.1173
Spain	.9750	.0028	.1138
South Korea	.9741	.0051	.1128
USA	.9737	.0021	.1125
Turkey	.9721	.0032	.1108
Taiwan	.97	.0049	.1087
Germany	.9676	.0072	.1063
France	.9674	.0048	.1061
United Kingdom	.9664	.0026	.1052
Argentina	.9634	.0049	.1022
China	.9617	.0132	.1004
Finland	.9581	.0011	.0969
Australia	.953	.0056	.0917
Poland	.9503	.0087	.0891
Colombia	.9454	.016	.0841
Denmark	.9415	.0057	.0803
South Africa	.9307	.0443	.0695
Latvia	.9304	.0094	.0692
Hungary	.9284	.0288	.0672
Greece	.9184	.0125	.0572
Nepal	.9146	.	.0534
Malaysia	.9087	.0231	.0474
Chile	.9047	.0047	.0435
India	.9010	.0302	.0398
Sweden	.9008	.	.0396
Venezuela	.8994	.0627	.0381
Ireland	.8949	.0043	.0337
Peru	.8845	.	.0232
Uruguay	.8833	.0507	.0220
Guatemala	.8817	.0173	.0204
Philippines	.8755	.0105	.0142
Norway	.8750	.0198	.0137
Indonesia	.8750	.0430	.0137
Netherlands	.8733	.0107	.0121
Costa Rica	.8423	.0428	-.0189
Egypt	.8077	.0267	-.0536
Kenya	.7875	.0477	-.0737
Ecuador	.7640	.044	-.0972
Mexico	.7572	.0588	-.1041
Malawi	.7437	.0092	-.1176
Morocco	.723	.0897	-.1383
Thailand	.723	.0950	-.1383
Trinidad - Tobago	.7056	.0120	-.1557
Cameroon	.6985	.09	-.1627
Sri Lanka	.6200	.0332	-.2413
Bangladesh	.4731	.	-.3882
Bolivia	.3863	.1053	-.4749
Ethiopia	.2137	.	-.6476

Table A2: Estimates of Government's bargaining weakness $(1-\sigma)$

Country	$(1-\sigma)$	St.Dev	Dev. from overall mean
Bangladesh	0	.	-.8621
Trinidad Tobago	.4785	.6768	-.3835
Venezuela	.562	.59	-.3
India	.5804	1.195	-.2816
Thailand	.6686	.1784	-.1934
Denmark	.7119	.6498	-.1502
Malawi	.7166	.5559	-.1455
South Korea	.7404	.4157	-.1217
Morocco	.7453	.1593	-.1168
Poland	.749	.5957	-.1131
Nepal	.764	.	-.0981
Brazil	.7877	.2353	-.0744
Philippines	.8238	.5618	-.0383
Hungary	.8320	.1762	-.03
Malaysia	.8333	.5964	-.0287
Ecuador	.8333	.3844	-.0287
Uruguay	.8408	.3234	-.0213
Romania	.8522	.	-.0099
Indonesia	.8581	.4336	-.004
Mexico	.8647	.2658	.0026
Ireland	.8732	.0575	.0111
Colombia	.8841	.2032	.022
Latvia	.8865	.1186	.0244
Sri Lanka	.9007	1.018	.0386
Egypt	.9077	1.926	.0456
Argentina	.9164	.1792	.0543
Spain	.9167	.1686	.0546
Greece	.9188	1.047	.0567
Finland	.9349	.0694	.0729
South Africa	.9376	2.272	.0755
China	.9509	1.422	.0888
United Kingdom	.9579	.3656	.0958
Cameroon	.9597	.2665	.0976
Costa Rica	.961	.1545	.0989
Peru	.963	.	.1009
Turkey	.9634	.1714	.1014
Norway	.9673	.1052	.1052
Japan	.9691	.0345	.1071
Taiwan	.97	.1283	.108
USA	.9726	.0447	.1106
Kenya	.9783	.1151	.1162
Guatemala	.9789	.0756	.1168
Chile	.9806	1.276	.1186
Netherlands	.9809	.0134	.1188
Germany	.9814	.1113	.1193
Italy	.9867	.2520	.1246
Bolivia	.9871	.0418	.125
France	1	.0157	.1379
Australia	1	.2288	.1379
Ethiopia	1	.	.1379
Sweden	1	.	.1379

Table A3: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
RTA	0.121	0.326	0	1	69161
FTA	0.065	0.247	0	1	69161
Government's welfare mindedness a	0.89	0.128	0.214	0.994	290
a after ME correction	.95	.642	-.342	12.44	290
Government's bargaining weakness $(1-\sigma)$	0.878	0.237	0	1	290
$(1-\sigma)$ after ME correction	0.881	0.233	0	1	290
Market size of partner (MS_j), in US 000	29127.933	159366.781	263.446	2262526.25	68961
Relative size (j/i)(RS)	-0.701	2.288	-8.517	8.227	68961
Abs. value of size difference (DMS)	9.011	2.066	-1.527	14.631	68961
UN Affinity Index (AI)	0.693	0.229	-0.468	1	46343
Imports	294982.671	2792603.118	0	231032976.557	177786
Log of Imports	8.271	3.864	-6.908	19.258	106300
Log of GDP(i)	25.505	1.701	20.855	29.915	69161
Log of GDP(j)	23.855	2.192	18.921	29.915	69161

Table A4: Estimates of the credibility value of trade agreements for the government

Country	Credibility value as % of production
Ethiopia	0.052
Bolivia	0.142
Kenya	0.351
Cameroon	0.537
Peru	0.584
India	0.648
Sweden	0.752
Egypt	0.785
Chile	0.824
Sri Lanka	0.933
Mexico	0.945
Norway	0.977
Costa Rica	1.02
Indonesia	1.06
Netherlands	1.17
Japan	1.18
USA	1.23
China	1.25
Ecuador	1.29
Argentina	1.45
Guatemala	1.48
Uruguay	1.48
Ireland	1.68
South Africa	1.68
Australia	1.69
Brazil	1.7
Colombia	1.78
Morocco	1.8
Germany	1.84
Finland	1.86
Philippines	1.91
Hungary	1.96
Greece	1.96
France	2.09
Thailand	2.19
Malawi	2.2
Romania	2.3
Venezuela	2.34
Poland	2.42
Nepal	2.42
United Kingdom	2.5
Malaysia	2.61
Taiwan	2.68
Turkey	2.74
Spain	2.78
South Korea	3.15
Denmark	3.23
Italy	3.46
Latvia	3.64
Trinidad - Tobago	3.67
Bangladesh	4.33