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Determinants of services trade agreements: Regulatory incidence and convergence

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Given the rise of services preferentialism in the last decade and the importance of domestic regulation for services trade, this paper examines the role of regulatory incidence and convergence as determinants of services trade agreements (STAs). Our results suggest that regulation is an important determinant of STA membership. They also suggest that geography, common institutions and pre-existing trade matter more than economic size and factor endowments for addressing regulatory incidence and convergence in services negotiations. Finally, we find that countries displaying greater regulatory convergence and less restrictive regulation are also more likely candidates for reciprocal services liberalization.

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Determinants of services trade agreements: Regulatory incidence and convergence

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Abstract

Given the rise of services preferentialism in the last decade and the importance of domestic regulation for services trade, this paper examines the role of regulatory incidence and convergence as determinants of services trade agreements (STAs). Our results suggest that regulation is an important determinant of STA membership. They also suggest that geography, common institutions and pre-existing trade matter more than economic size and factor endowments for addressing regulatory incidence and convergence in services negotiations. Finally, we find that countries displaying greater regulatory convergence and less restrictive regulation are also more likely candidates for reciprocal services liberalization.

JEL classification: F10, F13, F15

Key words: Services trade agreements; Economic determinants; STRI; Regulatory convergence

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1 Introduction

More than three decades of research on trade costs and goods trade unveiled fundamental insights into the determinants (Baier and Bergstrand, 2004), the relative magnitude and nature (Eaton and Kortum, 2002; Anderson and van Wincoop, 2003, 2004) and the consequences of barriers to cross-border transactions (Baier and Bergstrand, 2007, 2009; Bergstrand et al., 2013; Egger et al., 2011) of goods. However, much less is known about services trade and their impediments. Data on cross-border transactions of services became available only in the last decade, and data on service trade impediments have been collected and made available even more recently (for instance see Miroudot et al., 2012). Even though a cottage literature started evolving around the matter (see Francois and Hoekman, 2010, for a survey), key knowledge about fundamental drivers and consequences of service trade barriers is not available. This paper aims to bridge this gap by addressing the role of regulation in STA membership.

A striking feature of trade diplomacy in recent years has been the pace of preferential goods trade liberalization and rule-making. In the last decade, a similar trend has been observed regarding services trade. Of the 83 preferential trade agreements (PTAs) notified to the World Trade Organization (WTO) and in force prior to the year 2000, 73 (87.9%) featured provisions dealing exclusively with trade in goods. Since then and up until August 2013, another 176 PTAs have come into force of which 105 (59.7%) also include provisions on services trade[1]. This development indicates the rising importance of services trade in general, the growing need felt by countries to place such trade on a firmer institutional and rule-making footing, and the attractiveness of doing so on an expedited basis via preferential negotiating platforms (Sauvé and Shingal, 2011).

Unlike trade in goods, where the removal of border barriers retains significant negotiating traction, domestic regulation is the sole currency of negotiations in services trade (Mattoo and Sauvé, 2010). The importance and potentially trade- and investment-inhibiting impact of domestic regulation on service sector performance has received some attention in the literature (Kox and Nordås, 2007; Kox and Nordas, 2009). Regulatory incidence and heterogeneity have been shown to exert a significantly negative impact on bilateral services trade via Mode 3 ("Strict and different regulation discourages outward investment as local firms find it more difficult to enter foreign markets the more restricted they are at home," Kox and Nordas, 2009), which is the most dominant mode of service delivery (for instance

[1] As of 15 August 2013, the total number of STAs in force was 118. These included three alliances (MERCOSUR, EFTA and CARICOM) where an STA was negotiated after 2000 in addition to a pre-existing trade agreement in goods.

see Magdeleine and Maurer, 2008; Hoekman and Kostecki, 2001).

However, the role of regulation, both incidence and convergence, in STA membership has not been fully studied[2]. This paper focuses on the above issue from both a theoretical and empirical perspective using a self-assembled database covering all STA partners up until August 2013.

2 Related literature

Research on services preferentialism has been traditionally devoted to studying the trade effect of services accords on aggregate and disaggregated services trade flows (Pak, 2002; Grünfeld and Moxnes, 2003; Ceglowski, 2006; Kimura and Lee, 2006; Walsh, 2006; Lennon, 2008; Shingal, 2009; Francois and Hoekman, 2010; Marchetti, 2011; Egger et al., 2012; Shingal, 2013; Van der Marel and Shepherd, 2013).

More recently, researchers have begun to explore the impact that differing levels of and heterogeneity in regulation exert on bilateral services trade flows (Kox and Lejour, 2006; Francois et al., 2007; Kox and Nordas, 2007; Schwellnus, 2007; Fink, 2009; Kox and Nordas, 2009; van der Marel and Shepherd, 2013) and to estimate barriers to trade in services and FDI and/or provide estimates of services trade costs (Francois et.al. 2007; Miroudot et al., 2010; Van der Marel, 2011; Miroudot et al., 2012).

This literature has also evolved to explain services commitments in the GATS (Roy, 2011), those made reciprocally (Marchetti et al., 2012) as well as GATS+ commitments in STAs (Van der Marel and Miroudot, 2012).

However, the papers closest to ours are Baier and Bergstrand (2004), who were the first to examine the determinants of partners' propensities to negotiate trade agreements in goods, and Cole and Guillin (2012) and Egger and Wamser (2013), who explored the issue *inter alia* for services accords. None of these papers, however, examine the role of regulation in STA formation. In a more recent ADB working paper, Sauvé and Shingal (2014) conduct empirical analyses of these issues in the context of Asian STAs but do not embed this in a theoretical framework. Studying the role of regulation in STA membership from both theoretical and empirical perspectives for the full sample of STA partners is thus the main contribution of our paper. This is done through recourse to the World Bank's dataset on measures of services (regulatory) restrictiveness, the STRI (Borchert et al., 2012a,b) using a self-assembled database covering all STA partners up until August 2013.

[2] Sauvé and Shingal (2014) have addressed some of these issues in the context of Asian services markets but their analysis is not theoretical.

3 Theoretical framework

Let us think of goods production as to utilize physical capital (K) and labour (L) as two primary and services (S) as a secondary production factor.

We assume services to be produced by a mass of n_{is} specialized producers in country $i \in \{1, ...J\}$. Services are purchased in bundles, and goods producers perceive individual services as variants which they substitute at a constant elasticity of substitution σ_s. Service producers compete under monopolistic competition and charge a constant markup over marginal costs to cover fixed market entry costs. They employ capital and labour for both their output and for setting up business.

Goods are produced by a mass of n_{ig} specialized producers in country i. Goods are consumed in bundles, and final consumers perceive individual firms' output as variants which they substitute at a constant elasticity σ_g. Goods producers compete under monopolistic competition and charge a constant markup over marginal costs to cover fixed market entry costs. They employ capital and labour as primary production factors and services as a secondary production factor for both their output and for setting up business.

Let us use index $\nu \in \{g, s\}$ to denote one of two sectors, goods and services, and let us use indices $i, j \in \{1, ...J\}$ to denote countries. Then, the generation of goods and services is determined as

$$y_{is} = \phi_{is} k_{is}^{\alpha} l_{is}^{1-\alpha},\ y_{ig} = \phi_{ig} k_{ig}^{\beta} l_{ig}^{\gamma} d_{ig}^{1-\beta-\gamma}$$

where ϕ_{iv} is a country-specific generic total factor productivity parameter and d_{ig} is the factor demand for the bundle of services of a representative goods producer in i.

Using d_{iv} to denote the generic demand for the bundle of services (by goods producers) or goods (by consumers), we may define

$$d_{iv} = \left[\sum_{j=1}^{J} \int_{l \in D_{jv}} c_{iv}(l)^{\frac{\sigma_v - 1}{\sigma_v}} dl\right]^{\frac{\sigma_v}{\sigma_v - 1}}$$

where d_{ig} is a measure of utility in a utilitarian framework and d_{is} is the bundle demanded by goods producers as above.

With homogeneous production technologies, the generic aggregate demand for an individual service or good producer is

$$c_{ijv} = \frac{p_{ijv}^{1-\sigma_v} Y_{jv}}{P_{jv}^{1-\sigma_v}}$$

where $p_{ijv}^{1-\sigma_v}$ is the de-facto price charged by producers of v in country i to j-borne "consumers" (of final goods or services) gross of trade costs, Y_{jv} are aggregate expenditures in country j on v-type demand and $P_{jv} = \left[\sum_{i=1}^{J} n_{iv} p_{ijv}^{1-\sigma_v}\right]^{\frac{1}{1-\sigma_v}}$ is the price index of d_{iv}. In fact, $Y_{js} = n_{jg} P_{js} d_{js}$ and $Y_{jg}= n_{jg}\sum_{i=1}^{J} p_{jis} c_{jis}= w_j L_j+ r_j K_j$ is nothing else than GDP in j.

Denote the marginal production costs corresponding to the above technologies in country i generic sector v by ω_{iv}. Moreover, assume sector-specific iceberg-type transaction costs $t_{ijv} \geq 1$ between countries i and j so that $p_{ijv} = p_{iv} t_{ijv}$, where $t_{ijv} = 1$ if $j = i$. Then, constant markup pricing in sector v entails

$$p_{iv}= \frac{\sigma_v}{\sigma_v - 1} \omega_{iv}$$

and

$$c_{ijv}= \frac{p_{iv}^{1-\sigma_v} t_{ijv}^{1-\sigma_v} Y_{jv}}{P_{jv}^{1-\sigma_v}} = \frac{\omega_{iv}^{1-\sigma_v} t_{ijv}^{1-\sigma_v} Y_{jv}}{\sum_{k=1}^{J} n_{kv} \omega_{kv}^{1-\sigma_v} t_{kjv}^{1-\sigma_v}}.$$

Moreover, aggregate bilateral demand amounts to

$$X_{ijv} = \frac{n_{iv} p_{iv}^{1-\sigma_v} t_{ijv}^{1-\sigma_v} Y_{jv}}{P_{jv}^{1-\sigma_v}}.$$

Firm-level profits are

$$\Pi_{iv} = \frac{p_{iv} x_{iv}}{\sigma_v} - f_{iv},\ x_{iv} \equiv \sum_{j=1}^{J} x_{ijv},\ x_{ijv} \equiv \frac{c_{ijv}}{t_{ijv}}$$

where we may refer to x_{ijv} as the firm-level shipments of v-output by i-borne firms to j, which exceeds the corresponding consumption, c_{ijv}, whenever $t_{ijv} > 0$.

Primary factor market clearing requires

$$K_i = \sum_{v\in\{s,g\}} n_{iv} \left(f_{iv} + \alpha_{Kiv}(w_i, r_i) \sum_{j=1}^{J} c_{ijv} \right)$$

$$L_i= \sum_{v\in\{s,g\}} n_{iv} \left(f_{iv} + \alpha_{Liv}(w_i, r_i) \sum_{j=1}^{J} c_{ijv} \right)$$

where $\alpha_{Kiv}(w_i, r_i)$ and $\alpha_{Liv}(w_i, r_i)$ are the conditional demand parameters which correspond to the aforementioned technologies.

<Insert Figure 1 here>

4 Numerical analyses and hypotheses

The model in the previous section has well-known features regarding the role of trade costs on final goods for trade and welfare: a marginal reduction in trade costs on (final) goods t_{ijg} induces a direct positive effect on bilateral goods exports to the extent of $\sigma_g - 1 > 0$ which is mitigated partly by a positive impact on producer prices, p_{ig}, and on consumer prices P_{jg} (see Bergstrand, Egger, and Larch, 2013). The welfare effects of goods trade liberalization tend to be positive and are higher, the lower the cushioning effects on producer and consumer prices are, which is the case for smaller and less remote economies (see Baier and Bergstrand, 2004, and Egger and Larch, 2008).

The focus of this paper is on the effects of a liberalization of services trade by way of reducing t_{ijs}. Due to the similar economic structure between the goods and services sectors, we would expect similar patterns for goods as for services trade and production in the following sense: larger and more similar countries should produce and trade more in services as well as in goods; higher services trade costs from or to a country should reduce its services exports or imports, respectively; a marginal reduction in services trade costs, t_{ijs}, should directly increase bilateral services exports by $\sigma_s - 1 > 0$ units, but the total effect on such bilateral exports should be smaller due to mitigating effects on services producer prices p_{is} and customer prices P_{js}. Those features appear to be well in line with the stylized facts about services trade (see Egger, Larch, and Staub, 2012). However, the welfare effects of (intermediate) services trade liberalization in this model are somewhat less obvious, since a facilitation of services trade to some importing country on the one hand reduces the marginal costs of goods production in that country - which should unambiguously raise demand and income there - but it induces unambiguously negative effects on labor and capital demand on the other hand, which reduces disposable income. Hence, the total effects of a liberalization of (intermediate) services trade on welfare are less obvious than the ones of (final) goods trade.

4.1 Design of the comparative static analysis

In this sub-section, we focus on two facets of services trade liberalization: one being related to bilateral trade preferences and the other one to unilateral market access costs. Bilateral trade of services on the one hand should face less frictions than goods trade due to the nature of services – their delivery often does not require physical presence or transport in a narrow sense – but it appears to be restricted in many other ways on the other hand (through standards, regulation, accreditation, etc.), so that the volume of services trade is much smaller than that of goods trade in spite of the large share of services production in GDP of most developed economies (see Egger, Larch, and Staub, 2012). Unilateral market access through the imposition of specific regulatory standards in a country does not only affect services imports but also the domestic sales and production thereof. Higher regulatory services standards in a market affect all sellers to that market in a way that is akin to a lower services productivity, but only for delivery to that market. In what follows, we are interested in the effects of the two on welfare. For this, it appears to be useful to model services trade costs as a multiplicative composite of bilateral, b_{ijs}, and unilateral components,

m_{ijs}: t_{ijs}=$b_{ijs}m_{js}$. It is the purpose of the subsequent numerical analysis to provide insights in how b_{ijs} and m_{js} affect consumer welfare (from goods consumption) and how they interact with each other in doing so.

For that purpose, we set up a world economy which is in many ways similar to the one in Baier and Bergstrand (2004) and in Egger and Larch (2008): it is composed of six countries of which three pairs are located on a continent each. Akin to Egger and Larch (2008), we label continents as A, B, and C and numerate countries on those continents as 1 and 2. Since the focus of the present study is not on regional (continental) or super-regional (cross-continental) trade agreements, we do not impose specific differences between continents but treat all countries as symmetric at the outset. However, the labeling is useful since we focus on changes *ceteris paribus* of services trade costs $t_{ijs} = b_{ijs}m_{js}$ where $i, j = \{1A, 2A\}$. We will do so for larger and more or less remote countries for $1A$ relative to $2A$ as well as for $1A$ and $2A$ together relative to the other economies.

4.2 Summary of numerical results and formulation of hypotheses

In what follows, we will formulate hypotheses with regard to welfare effects of unilateral, regulatory services cost reductions and to ones of preferential, bilateral services cost reductions. We will generally refer to the former as hypotheses H^U and to the latter as hypotheses H^P.

Services liberalization in symmetric economies: In Figure 1, we illustrate how a reduction of the unilateral services regulatory costs in country $1A$ and a reduction in symmetric bilateral (iceberg) services trade costs between $1A$ and $1B$, given positive levels of symmetric bilateral (iceberg) services trade costs of $1A$ and $1B$ with countries on the other continents, affect welfare in country $1A$. Since we consider a shift in regulatory services costs at various levels of symmetric bilateral iceberg services costs, there are two insights to be gained from Figure 1: one regarding regulatory cost reductions and one regarding preferential bilateral services cost reductions.

Hypothesis H^U 1: Reducing regulatory services impediments unilaterally in an economy induces welfare gains which are maximized at intermediate, non-zero bilateral (iceberg) services trade costs

The figure suggests that there is a hump-shaped relationship between services (iceberg) trade costs and the welfare gains from abolishing regulatory services costs. Clearly, this pattern is related to the fact that regulatory costs work as amplifiers of iceberg trade costs. In the complete absence of iceberg services trade costs, unilateral regulations would be irrelevant in CES economies. There is a second insight from Figure 1 with respect to the effects of preferential, bilateral iceberg trade cost reductions.

Hypothesis H^P 1: Granting another economy reciprocally preferential market access unambiguously raises welfare. The welfare gains are larger the smaller the bilateral services trade costs will be after the liberalization and the bigger they were beforehand. Countries with the biggest willingness to reduce regulatory services costs unilaterally would also benefit the most from abolishing services trade costs bilaterally.

The first part of Hypothesis H^P 1 is not surprising, and it reflects the same effects as iceberg trade cost reductions would, e.g., in single-sector economies. However, the second part is interesting, and it flows from the non-linear (convex) relationship between iceberg trade costs and welfare gains and the trade-cost-amplification nature of regulatory costs. It turns out that the ascent of the welfare gains function with regard to b_{1A2A} starts becoming much steeper (to the left of) where the welfare gains from regulatory cost reductions are highest.

Services liberalization in two large economies: Figure 2 illustrates the welfare effects for two large economies relative to the rest of the world. As in the outset, these two countries are symmetric in size to each other. For the derivation of hypotheses on the joint size of two economies with regard to the welfare effects of services trade and regulatory liberalization, it is useful to compare Figure 2 with Figure 1.

As before, the welfare effects of unilateral, regulatory liberalization are hump-shaped in bilateral iceberg services trade cost (b_{1A2A}-)space. Two larger countries gain more *absolutely* (the amount of real GDP generated is bigger; not visible in Figure 1), but gain less *relatively* to a situation with fill liberalization. The reason for this is clear and not different from goods trade liberalization: at some positive trade costs large countries consume relatively more domestically than from abroad so that their relative dependence on foreign countries is weaker. Moreover, the absolute welfare gains from unilateral liberalization are larger but the relative ones (illustrated in the figure for better comparison) are smaller than for two smaller economies.

Hypothesis H^U 2: Reducing regulatory services impediments unilaterally in larger economies induces absolute welfare gains that are larger and relative welfare gains that are smaller than reducing them in smaller economies.

The insight summarized in Hypothesis H^U 2 could also be gained from a unilateral liberalization in a large country and bilaterally between a large and a small country with the rest of the world consisting of medium-sized countries as illustrated in Figure 3 below.

Hypothesis H^P 2: Granting another economy reciprocally preferential market access unam-

biguously raises welfare. The welfare gains are larger the smaller the bilateral services trade costs will be after the liberalization and the bigger they were beforehand. Preferential services trade liberalization among larger economies generates bigger absolute and smaller relative welfare gains than doing so among smaller economies.

Preferential services trade liberalization between a large and a small economy: As indicated before, for the consequences of a unilateral liberalization in regulatory costs in large country $1A$, it is qualitatively irrelevant whteher all other countries were equally small relative to it, or whether country $2A$ was smaller than the countries in the rest of the world or not. However, country asymmetry between two reciprocally preferentially liberalizing economies is important for the welfare effects as is indicated by Figure 3. However, a comparison of Figures 3 and 1 suggests that the benefits of a unilateral liberalization of regulatory services costs are relatively larger over a wider range of medium to high trade costs with a small natural trading partner than with a larger one. The reason is that the trade effects of such a regulatory change are relatively (but not absolutely) bigger in case of liberalization with a smaller than with a larger country.

Hypothesis H^U 3 : *Is the same as Hypothesis* H^U 2.

The welfare gains from liberalizing services trade costs preferentially for a larger relative to its smaller trading partner are relatively (but not absolutely) higher at high regulatory standards in the large country than with two similarly-sized economies. On the contrary, those relative welfare gains are relatively (but not absolutely) smaller at low regulatory standards in the large country than with two similarly-sized economies. To see this, compare the difference in welfare for bilateral services trade costs of $b_{1A2A} = 2$ with those at $b_{1A2A} = 0$ with the blue versus red schedules of Figures 3 and 1.

Hypothesis H^P 3 : *Granting another economy reciprocally preferential market access unambiguously raises welfare. The welfare gains are larger the smaller the bilateral services trade costs will be after the liberalization and the bigger they were beforehand. Preferential services trade liberalization among a larger and a smaller economy generates bigger absolute and smaller relative welfare gains than doing so among smaller economies with high regulatory costs in the large country. The opposite is true with low regulatory costs in the large country.*

Services liberalization in economies which are remote in goods versus services trade:

Figures 4 and 5 illustrate the consequences of high bilateral trade costs in goods versus services of countries $1A$ and $2A$ with the other countries.

Hypothesis H^U 4 : *Reducing regulatory services impediments unilaterally in more goods-trade-remote economies induces absolute welfare gains that are smaller and relative welfare gains* *that are larger from a reduction in regulatory services standards. Reducing regulatory services impediments unilaterally in more services-trade-remote economies induces absolute welfare gains that are smaller and relative welfare gains that are smaller from a reduction in regulatory services standards.*

The insight summarized in *Hypothesis* H^U 4 could also be gained from unilateral liberalization in a large country and bilaterally between a large and a small country with the rest of the world consisting of medium-sized countries as illustrated in Figure 3 below.

Hypothesis H^P 4 : *In more goods-trade-remote economies the absolute welfare gains are smaller and the relative ones are larger for highly services regulated countries. In more goods-trade-remote economies the absolute welfare gains are larger and the relative ones are smaller for services unregulated countries. In more services-trade-remote economies the absolute welfare gains are smaller and the relative ones are larger for highly services regulated countries. This is even more pronounced than with goods-trade-remote economies. In more services-trade-remote economies the absolute welfare gains are smaller and the relative ones are larger for services unregulated countries.*

The results from *Hypothesis* H^P 4 regarding the relative welfare gains relate to the average slopes of the blue and red loci in Figures 4 and 5 relative to each other and relative to Figure 1.

Services liberalization in economies with high services cost shares: If goods production depends strongly on services inputs, the expenditure share on services is relatively high. The welfare effects from regulatory services change and a liberalization of bilateral services trade costs for such a situation is displayed in Figure 6, which should be compared with Figure 1.

Hypothesis H^U 5 : *At a high services expenditure share the welfare gains from a unilateral regulatory services cost reduction rise more monotonically than in a situation with low cost share of services in goods production. Reducing regulatory services impediments unilaterally then raises welfare more strongly at high bilateral services trade costs than otherwise.*

Hypothesis H^P 5 : *In economies with a high cost share of services in goods production the absolute and relative welfare gains from preferential services trade liberalization are higher than otherwise, relatively independently of the regulatory standards applied.*

The insights from *Hypothesis* H^P 5 can be gained when comparing the slopes and locations of the schedules in Figure 6 relative to the one in Figure 1.

5 Empirical methodology

Our empirical framework draws on McFadden (1975, 1976) qualitative choice models, where utility, here, the (minimum or average) net gains for two countries from participating in an STA, is modeled as a latent, unobservable variable ($y*$), which can be explained by a vector of explanatory variables (x). Since $y*$ cannot be observed, an indicator variable STA is used which takes the value 1 (indicating $y* > 0$) if two countries participate in a common STA and 0 (indicating $y* \leq 0$) otherwise.

More formally, $STA_{ij} = 1$ if $y* > 0$ and $P(STA_{ij} = 1)= P(y* > 0)= G(\alpha + \beta x_{ij})$. . . . . . .(1)

where P is the response probability associated with a trading dyad (ij) signing a services accord; $G(.)$ is a cumulative distribution function that ensures that $P(STA_{ij} = 1)$ lies in the unit interval; and x_{ij} is the vector of explanatory variables for a generic country pair.

As in Baier and Bergstrand (2004), empirically, (1) is estimated by a probit model, assuming normality about the error term in the latent process. Clearly, independent of the assumed cumulative distribution function, the non-linear nature of $G(.)$ implies that the coefficient estimates only reveal the signs of the partial effects of changes in x_{ij} on the probability of signing a STA. Thus, the direction of the effect of variable x_k on $E(y * |x) = \alpha + \beta x$ is only qualitatively (not quantitatively) identical to the effect of x_k on $E(STA|x) = G(\alpha + \beta x)$, where $E(.)$ denotes the expectation operator.

The main objective of STAs is to increase trade in services between partners. Reducing levels of restrictive regulation and promoting regulatory convergence are important channels through which services accords expand services trade volumes. Thus, the determinants of a country's choice to negotiate a services accord are likely to be indistinguishable from those that inform whether certain countries are more likely candidates for a reduction in restrictive regulation as well as for regulatory convergence.

Thus, in distinct regressions, we explain the restrictiveness of services regimes in a dyad and regulatory heterogeneity between partners using the same set of controls as used for explaining STA membership. The theoretical justification for this follows from hypotheses H^P6 and H^P7 in Section 4.

Formally, $DREG_{ij}^{lev} = \vartheta + \pi x + \varepsilon$ . . . .(2)

where $DREG_{ij}^{lev}$ is the absolute value of the difference between the levels of the services trade restrictiveness index ($STRI$) of two countries and ε is an error term.

Moreover, $SREG_{ij}^{lev} = \mu + \varphi x + \xi$..(3)

where $SREG_{ij}^{lev}$ is the sum of the levels of STRI of two countries and ξ is an error term.

We found the dependent variables in equations (2) and (3) to be characterized by heteroskedasticity which rendered a log-linear OLS estimation biased (see Colin and Trivedi, 2005; Santos Silva and Tenreyro, 2006). Therefore we used Poisson pseudo-maximum likelihood (PPML) estimation for inference.

6 Explanatory variables

In their seminal work exploring the determinants of partners' propensities to negotiate bilateral trade agreements, Baier and Bergstrand (2004) documented that distance, remoteness, economic country size, and factor endowments were the main economic determinants of goods trade agreements and that their impact on empirical membership probability was consistent with economic theory. They also considered other institutional and political economy determinants in their sensitivity analyses. Following them, we use a largely overlapping set of determinants in our empirical analyses. Our choice of explanatory variables also emanates from the theoretical hypotheses in Section 4.

For any dyad ij, the vector x includes two geographical variables: "$Natural_{ij}$" which is the inverse of distance between i and j and "$Remote_{ij}$" which is the simple average of the mean distance between both countries and their partners.

Formally, $Remote_{ij} = dcont_{ij} \times \left\{ \frac{\left[ln\left(\sum_{k=1,k\neq j}^{N} d_{ik/(N-1)}\right) + ln\left(\sum_{k=1,k\neq i}^{N} d_{jk/(N-1)}\right)\right]}{2} \right\}$

where "d" is the bilateral distance in kilometers and "$dcont_{ij} = 1$" if i and j are located on the same continent, 0 otherwise.

In line with H^P4, we also use additional measures of "remoteness" R_{ig}, R_{jg}, R_{is}, and R_{js} which are (natural log of) bilateral distance-weighted trade in goods (g) and services (s) for each reporter (i) and partner (j) averaged by all other countries in the sample.

Formally, $R_{ig} = \ln\sum_{i=1}^{N} \left[\frac{avg(X_j^g, M_j^g)}{d(N-1)}\right]$, $R_{is} = \ln\sum_{i=1}^{N} \left[\frac{avg(X_j^s, M_j^s)}{d(N-1)}\right]$ and analogously for R_{jg} and R_{js}

where X^g is goods exports, M^g is goods imports, X^s is services exports and M^s is services imports. The theoretical justification for these variables comes from H^P4.

Economic country sizes, indicated in H^P2 and H^P3, are represented by $SRGDP_{ij}$, which is the sum of the natural logs of real GDP of country i and j and $DRGDP_{ij}$, which is the absolute value of the difference between the natural logs of real GDP of two countries.

Services share in GDP, indicated in H^P5, is the average services share in GDP for trading partners in a dyad.

$DKL_{ij}$and $DROWKL_{ij}$ determine the role of factor endowments in countries' propensities to negotiate agreements. DKL_{ij} is the absolute value of the difference between the natural logs of capital-labour ratios of country i and j. Apart from DKL_{ij}, Baier and Bergstrand (2004) suggest using $SQDKL_{ij}$ – the squared value of DKL_{ij} – in order to control for the likely non-linear impact of DKL_{ij} on the net gains from participating in a trade agreement. Moreover, to account for dependence of i and j on each other, Baier and Bergstrand (2004) suggested including $DROWKL_{ij}$ which is calculated as the absolute value of the difference between the natural logs of capital-labour ratios of countries i and j and those of ROW.

Formally,$DROWKL_{ij}= \frac{1}{2}\left[\left\{ln\left(\frac{\sum_{k=1,k\neq j}^{N}K_k}{\sum_{k=1,k\neq i}^{N}L_k}\right)-ln\left(\frac{K_i}{L_i}\right)\right\}+\left\{ln\left(\frac{\sum_{k=1,k\neq j}^{N}K_k}{\sum_{k=1,k\neq i}^{N}L_k}\right)-ln\left(\frac{K_j}{L_j}\right)\right\}\right]$

Institutional variables in x_{ij} include common language, colonial antecedents and legal origins. These are the bilateral trade cost variables that are traditionally used in the gravity literature and also indicated in H^P1. More importantly from the perspective of this paper, we also control for the level of services regulation in the dyad ($SREG_{ij}$, which is the sum of the natural logs of $STRI_i$ and $STRI_j$) and regulatory heterogeneity between partners by including the absolute value of the difference between the natural logs of STRI of both countries ($DREG_{ij}$).

We also test for complementarities between goods and services trade by using data on countries' average bilateral merchandise trade (BTG_{ij}).

Formally $BTG_{ij}= \ln\left(\frac{M_{ij}^g+X_{ij}^g}{2}\right)$ where M_{ij}^g = goods imports into i from j and X_{ij}^g = goods exports from i to j.

Finally, to control for historical policy alignment, we also control for active goods trade agreements in the year 1980 (GTA_1980).

7 Testable propositions

The analysis in Section 4 leads to the following testable propositions for STAs:

1. Neighbouring countries are more likely to sign a services trade agreement especially if both are remote from the rest of the world with respect to goods trade, though not with respect to services trade.

2. The "natural trading partner hypothesis" is also expected to hold true for STAs.

3. Similar and larger economically-sized countries are also likely to gain more due to the exploitation of economies of scale and the presence of greater varieties flowing from deeper integration in services markets.

4. The greater the difference in relative factor endowments between countries, and the larger the intercontinental trade costs, the more trade creation is likely to be.

5. The greater the difference in relative factor endowments between potential partners and the ROW, the more likely trade diversion becomes.

6. A higher services share in GDP leads to higher absolute and relative welfare gains from preferential services liberalization.

7. Complementarities between goods and services trade suggest that more bilateral merchandise trade is likely to be associated with a greater inclination to negotiate a trade accord.

8. Dyads with common institutions and homogeneity in regulation are more likely to enter into agreements as are partners with low initial barriers to services trade.

9. Partners with existing trade agreements in goods are also more likely to negotiate STAs.

In estimating equation (1), we thus expect the coefficients of $Remote_{ij}$, $Natural_{ij}$, R_{ig}, R_{jg}, $SRGDP_{ij}$, DKL_{ij}, $SQDKL_{ij}$, Services share, BTG_{ij}, GTA_1980, and the institutional variables to be positive while those of $DRGDP_{ij}$, $DROWKL_{ij}$, R_{is}, R_{js}, $SREG_{ij}$ and $DREG_{ij}$to be negative.

8 Data

Data on trade agreements are taken from the WTO's Regional Trade Agreements Information System database, where $STA = 1$ for agreements notified under Article V of the GATS during 1958- 15 August 2013 and 0 otherwise. $GTA\_1980 = 1$ for agreements notified under Article XXIV of the GATT during 1958-1980 and 0 otherwise.

The earliest STA was the EC Treaty that entered into effect (eif) in 1958 (but only notified to the WTO in 1995). After that, there was one STA in the 1980s (Australia-New Zealand, eif 1989), eight during the 1990s (including both the NAFTA and the EC enlargement) and

108 STAs since the year 2000. Since trade agreements are typically phased in over a multi-year transition period, to control for potential endogeneity in estimation, our data on the time-varying independent variables in x_{ij} are measured in the year 1980. The choice of this early year is also likely to control for any domino effects that the earliest STAs may have exerted on the recent wave of services preferentialism since 2000 during which 108 of the 118 WTO-notified STAs have come into effect.

The CEPII gravity dataset (Head et al., 2010) provides geographic distances between capital cities, used to compute $Natural_{ij}$ and $Remote_{ij}$. Data on real GDP and population are taken from the Penn World Tables (Heston and Summers, 2011) and these are used to calculate $SRGDP_{ij}$ and $DRGDP_{ij}$.

We approximated factor endowment ratios K_i/L_i by using real per capita income (PCY). This was done since we measured time-variant determinants of STAs 14 years prior to the data of STA membership (prior to the entering of all STAs in the data). At that time, using the perpetual inventory method to estimate capital stocks as in Baier and Bergstrand (2004) would have led to an unjustifiable loss of observations. Moreover, real per-capita income ratios are highly correlated with capital-labour ratios (see Egger and Larch, 2008; Bergstrand et al., 2010)[3]. Data on PCY are also taken from the Penn World Tables.

Data on common language and colonial antecedents are taken from the CEPII gravity dataset (Head et al. 2010), while those on legal origins are compiled using La Porta et al. (1999)[4]. All trade data were averaged over 1979-1981 to minimize fluctuations in recording practices. Data on X^g_{ij}, M^g_{ij} used to construct BTG_{ij} and X^g, M^g used to construct R_{ig}, R_{jg} were sourced from UN Comtrade. Data on X^s, M^s used to construct R_{is}, R_{js} and services shares in GDP were taken from the World Bank's World Development Indicators .

Finally, ten countries in our sample did not exist in the year 1980: these included the Czech Republic and nine former USSR republics[5]. GDP, services share and merchandise trade data for these countries were constructed for the year 1980 and 1980-82[6], respectively. This was done by multiplying historical GDP, services value added and merchandise trade data (both corrected for inflation) for Czechoslovakia and the USSR by the shares of the Czech Republic and each of the nine former USSR republics, respectively, in "constructed Czechoslovakian" and "constructed USSR" GDP, services value added and merchandise trade, respectively, in

[3]The correlation coefficient between real PCY and K/L in the subsample of our data for which both variables exist is close to 0.9.

[4]http://www.economics.harvard.edu/faculty/shleifer/files/qgov_web.xls

[5]These were Armenia, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Lithuania, Russia, Ukraine and Uzbekistan.

[6]Trade data for these countries were missing in 1979.

the year 1994[7].

However, services trade data were not available historically and hence, these were constructed using actual data shares from 1999-2001[8] as below:

$$Trade^S_{i1979-81} = \sum_i Trade^S_{i1979-81} \times \frac{Trade^S_{i1999-2001}}{\sum_i Trade^S_{i1999-2001}} \text{ where } Trade^s_i = avg(X^s_i, M^s_i)$$

The measure of regulation in services markets used in this paper is the World Bank's Services Trade Restrictiveness Index (STRI; Borchert et.al. 2012 a, b). Compiled from responses to questionnaires sent out by the World Bank to 79 developing countries on "impediments to international integration" and from publicly available information for OECD countries, the STRI is a quantitative index of restrictions on services trade encompassing 103 countries, 5 major service sectors and 19 sub-sectors. The information is also available by modes of service delivery.

A comparison of STRI by regions/groups in Figure 2 shows that the Middle-East & North Africa (MENA) has the most restrictive services trade policies, followed by South Asia (SA), East Asia & the Pacific (EAP) and Sub-Saharan Africa (SSA), with the last also being the most heterogeneous cohort. As expected, the OECD and East & Central Asia (ECA) not only report the lowest STRI values but also form the most homogeneous cohorts.

<Insert Figure 2 here>

A closer look at Figure 2 also provides an insight into the factors likely to influence the choice of partners for negotiated regulatory convergence. For instance, high levels of per capita income (PCY), economic development and political stability all likely feature behind the observed homogeneity in STRI among OECD countries though there are significant differences in language, culture and distances within this cohort. In the case of ECA on the other hand, there is far more homogeneity in terms of language, culture and distances, though more differences in terms of PCY and levels of development. This seems to suggest that a combination of these factors could determine which countries are potential candidates for negotiated regulatory convergence.

The STRI data are available for 103 countries, leading to 5253 [$= (103 \times 102)/2$] possible dyads (treating pair ij and pair ji as the same dyad). There was an STA in force between 462 of these dyads until 15 August 2013. A preliminary analysis of the variables in x_{ij} shown

[7] This was the earliest year of the coming into existence of all these ten countries.

[8] These were the earliest years for which services trade data were consistently available for all these ten countries.

in Figure 3 reveals that STA members relative to non-members in our sample are closer in terms of distance but more remote, larger in terms of real GDP and more similarly-sized, have smaller differences in PCY (and hence, relative factor endowments) with respect to each other but not compared to ROW, display less restrictive and more homogeneous services regulation, are more likely to have a common language, and exhibit higher (historical) levels of bilateral merchandise trade. The 103 countries in our sample are listed in Annex Table A1 and all data are summarized in Annex Table A2.

<Insert Figure 3 here>

9 Estimation results

The results from the Probit estimation are reported in Table 1. The first three specifications control for economic and trade determinants first separately and then together. Specification 4 introduces institutional controls while specifications 5 and 6 include combinations of these with economic and trade determinants. The final specification 7 controls for all determinants together.

<Insert Table 1 here>

The results reported in columns 1, 2 and 4 suggest that economic determinants exert a greater influence than both institutional and trade factors though the model has the lowest explanatory power with the lattermost (pseudo-R-squared = 12%). Moreover, most of the variables within these three sets of determinants, with the exception of the factor-endowment proxies and common law, are individually statistically significant.

As expected, less distant and more remote dyads, large sized economies with less restrictive and more homogeneous services regulation and a common language are more likely to negotiate a services accord. The coefficients on $DPCY$ and $DROWPCY$ provide no evidence in these results for either Hecksher-Ohlin trade determinants in driving STAs or for any inter-industry trade diversion. Counter-intuitively, these results also suggest that having common colonial antecedents reduces the propensity to negotiate a STA. The unexpected positive coefficient on BTG_{ij} seems to provide more evidence in support of the domino theory (Baldwin, 2006) than for the endogenous protection literature. While the GTA_1980 variable drops out of these estimations, the positive coefficients on $min(Trade^S_{ij})$ and $max(Trade^S_{ij})$ provide evidence for both supply and demand factors in fostering reciprocal services liberalization.

These results generally hold in specifications 3, 5 and 6 though the explanatory power of the model is considerably improved when economic and institutional factors are combined. When all factors are controlled for in specification 7, only $Remote_{ij}$, $Natural_{ij}$, $DRGDP_{ij}$, services trade and the regulatory variables retain statistical significance; these variables have the same impact as earlier. Interestingly, the explanatory power of this fully specified model is the same as that of the model with economic and institutional determinants being combined together; since the latter covers the full sample, we use it to assess our model's predictive power.

A comparison[9] of our model's predictions for STA using the specification in column 5 with the actual value of STA reveals that the propensity to negotiate (or not) a STA is correctly predicted for 93% of the dyads in our sample. Of the total, there was an STA between 462 dyads and 39.4% of these were correctly predicted by the model. The remaining 4791 dyads did not have a services accord and our model correctly predicted 98.3% of these. Matthews (1975) correlation coefficient[10], calculated from these predictions, reported a value of 0.49, indicating reasonable fit between the actual and predicted propensities to negotiate STAs.

9.1 Secondary results

Table 4 reports the results from the PPML estimation of equation (2). As before, columns 1, 2 and 4 report the results from estimations that control for economic, trade and institutional determinants separately; columns 3, 5, 6 and 7 report results from estimations that include these variables in different combinations.

<Insert Table 4 here>

At the outset, the explanatory power of the secondary estimation is low; even the fully-specified model in column 7 has an R-squared of only 5.9%. This said, a few of the explanatory variables report expected signs on coefficients. Thus, dyads more remote from ROW tend to be more homogeneous in services regulation – the coefficient on $Remote_{ij}$ is negative

[9] To enable this comparison, we used the standard decision-rule for assessing probit models. If $STA^{pred} > 0.5$ then we take this value to be 1. If $STA^{pred} <= 0$ then we take this value to be 0.

[10] $MCC = ((TP \times TN) - (FP \times FN))/\sqrt{(TP + FP) \times (TP + FN) \times (TN + FP) \times (TN + FN)}$where MCC = Matthews correlation coefficient, TP = number of true positives, TN = number of true negatives, FP = number of false positives and FN = number of false negatives.

and statistically significant across specifications. Commonality in institutions is likely to result in a demand for (and greater supply of) regulatory convergence – we see evidence of this in the coefficients on common colonial antecedents and common language in specifications 4 through 7.

On the other hand, $DRGDP_{ij}$ reports statistical significance, but unexpected signs. The result on the sum of economic size of trading partners is harder to interpret as our sample data suggest the near-absence of a relationship between market size and regulatory heterogeneity (correlation coefficient = -0.05). The impact of combined market size on differences in regulation is thus uncertain and perhaps this is what is reflected in the near-zero coefficient on $SRGDP_{ij}$ across specifications in Table 4.

The coefficient on BTG_{ij} is negative as expected and statistically significant throughout specifications. Sectors characterized by greater trade intensity are also more likely to see a convergence in regulation facilitating such trade. Finally, the positive coefficients on $min(Trade^{S}_{ij})$ are also in line with our expectations on historical regulatory heterogeneity.

While there are no established a priori for explaining the restrictiveness of services regimes in a dyad, results from the PPML estimation of equation (3) reported in Table 5 suggest more restrictive services regimes in a dyad if:

- it is more remote from ROW;

- the countries in the dyad are more distant from each other;

- it comprises smaller sized and dissimilar economies;

- it has larger differences in factor endowments both between members and compared to ROW;

- it has lower levels of pre-existing bilateral merchandise trade or the absence of any institutionalized preferential trading arrangement in goods;

- there are differences in language (though weakly significant) between the members;

- if there is more minimum inclination towards world services trade and less maximum inclination; and

- interestingly, if it has common legal and colonial antecedents

<Insert Table 5 here>

9.2 Sensitivity analysis

The STRI data generally pertain to the year 2008 for most countries in the sample. Since regulatory convergence and a reduction in services restrictiveness are objectives of services preferentialism, to minimize endogeneity in our estimation emanating from reverse causality, we now only consider services accords that came into effect in the year 2008 and beyond. Results from estimating equations (1) to (3) for this sub-sample are reported in Annex Tables 3 to 5, respectively.

These robustness results from equation (1) provide little evidence for the role of factor-endowments or for common colonial antecedents in determining STA membership. On the other hand, these results provide more robust evidence for the positive role of a common language and counter-intuitive evidence for the negative impact of the common law variable. The coefficient on the $min(Trade^S_{ij})$ variable also turns negative in specifications 2 and 3, thus negating the role of supply forces in promoting services preferentialism. The remaining results in Annex Table 3 are qualitatively similar to those reported in Table 1: the impact of $Remote_{ij}$, $SRGDP_{ij}$ and the regulatory variables is lesser than in the full sample and there is more robust evidence for the positive role of the BTG_{ij} variable.

Annex Tables 4 and 5 report the robustness results from estimating equations (2) and (3) and these are found to be qualitatively similar in general to those reported in Tables 4 and 5, respectively, though the GTA_1980 drops out of these results.

In Annex Table 4 results, the coefficient on $Natural_{ij}$ is statistically significant while those on $SRGDP_{ij}$ and $DROWPCY_{ij}$ are weakly significant; the common language variable reports a more robust presence in these results. However, the likely impacts of all these variables on regulatory heterogeneity in a dyad are the same as in the full sample.

In Annex Table 5 results, the one major difference is the change in the sign of the $Natural_{ij}$ variable: the robustness results suggest that the restrictiveness of services regulation in the dyad is inversely related to the geographical distance between the countries, which is a rather interesting result. The impact of factor endowment differences also acquires a nonlinear relationship now. The remaining variables retain impacts similar to those in the full sample.

10 Conclusion

This paper examines the role of regulatory incidence and convergence in determining STA membership. Our empirical results suggest that large-and similar-sized economies that are distance-wise closer and remote (from ROW), with lower levels of restrictive but more homogeneous services regulation are more likely to negotiate services agreements with each other. Our results also suggest that remote and less similar-sized economies, with high levels of bilateral merchandise trade, common language and colonial antecedents are more likely candidates for regulatory convergence in STAs. Finally, the restrictiveness of services regimes in a dyad seems to be directly related to its remoteness from ROW, to the geographical distance between the countries and to their factor endowment differences as well as interestingly to commonality in legal institutions and colonial antecedents. The incidence of services regulation in a dyad is also found to be inversely related to the sizes of and similarities between countries in terms of GDP, to levels of bilateral merchandise trade and pre-existing goods agreements. Our results suggest that regulation (both incidence and heterogeneity) are important determinants of STAs. They also suggest that geography, common institutions and pre-existing trade matter more than economic size and factor endowments for addressing regulatory incidence and convergence in services negotiations. Finally, we also find that countries displaying greater regulatory convergence and less restrictive regulation are more likely candidates for reciprocal services liberalization.

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Figure 1: Assessing the impact of goods versus services trade preferentialism and regulations

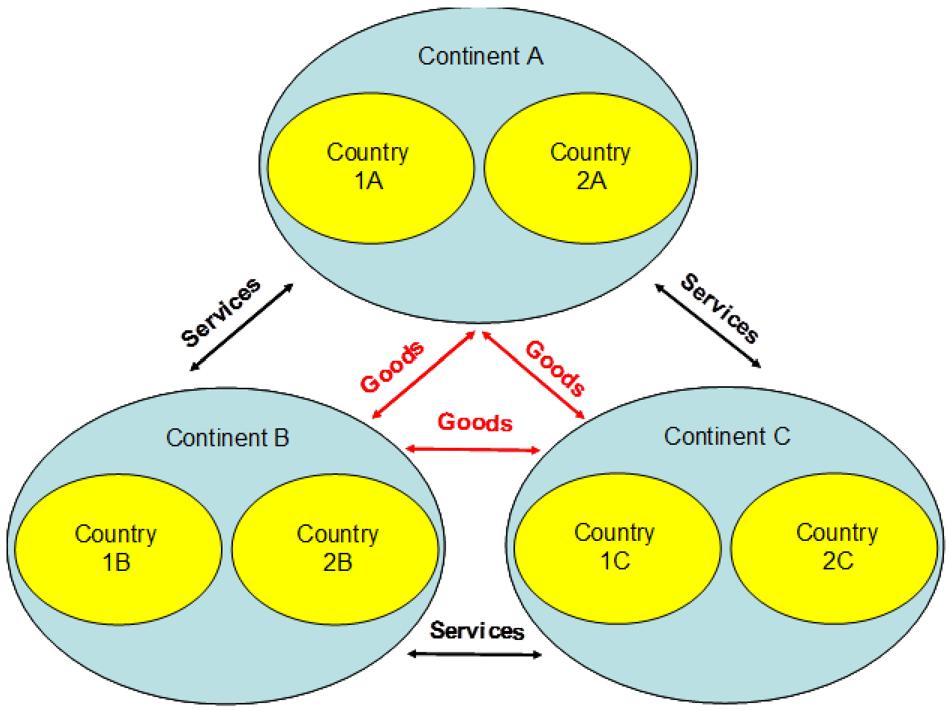
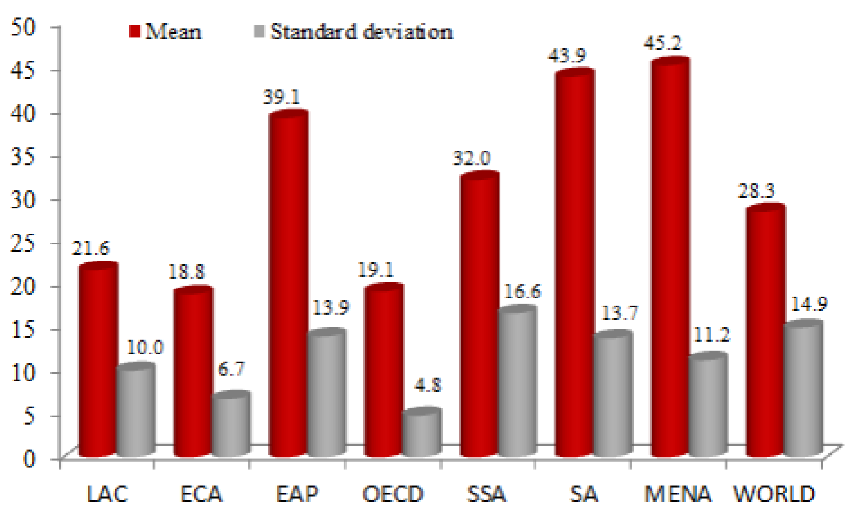


Figure 2: Comparison of STRI across regions/groups



Source: Author calculations based on World Bank STRI database

Figure 3: Role of STA determinants: Members v Outsiders (ratio of mean values)

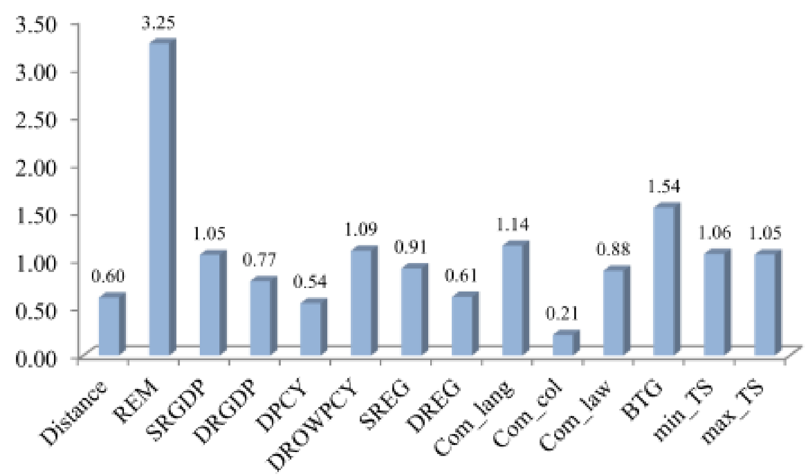


Table 1: Estimating the likelihood of negotiating a services trade agreement

	Probit estimation: Dependent variable STA						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	0.921	1.321*	0.997	0.232	0.216	0.317	0.233
	(0.679)	(0.535)	(0.682)	(0.595)	(0.745)	(0.584)	(0.745)
Rjg	0.816***	1.088***	0.803***	1.352***	0.592**	0.889***	0.578**
	(0.212)	(0.175)	(0.211)	(0.171)	(0.216)	(0.177)	(0.214)
Ris	-0.773	-1.054*	-0.848	0.120	-0.157	-0.111	-0.180
	(0.672)	(0.522)	(0.674)	(0.584)	(0.739)	(0.574)	(0.738)
Rjs	-0.599**	-0.736***	-0.586**	-0.943***	-0.524*	-0.670***	-0.521*
	(0.205)	(0.172)	(0.204)	(0.168)	(0.206)	(0.171)	(0.204)
Remote	0.077***		0.078***		0.084***		0.085***
	(0.009)		(0.010)		(0.011)		(0.011)
Natural	0.237***		0.208***		0.272***		0.239***
	(0.053)		(0.055)		(0.058)		(0.061)
SRGDP	0.158***		0.134***		0.167***		0.134***
	(0.014)		(0.018)		(0.016)		(0.021)
DRGDP	-0.115***		-0.105***		-0.141***		-0.131***
	(0.025)		(0.026)		(0.029)		(0.029)
DPCY	0.048		0.040		0.076		0.069
	(0.141)		(0.142)		(0.146)		(0.147)
SQDPCY	-0.100#		-0.102*		-0.069		-0.073
	(0.051)		(0.052)		(0.052)		(0.052)
DROWPCY	-0.048		-0.069		-0.046		-0.072
	(0.083)		(0.083)		(0.107)		(0.106)
Services share	3.580***		3.133***		3.147***		2.623***
	(0.362)		(0.393)		(0.412)		(0.447)
BTG		0.064***	0.013#			0.072***	0.019*
		(0.007)	(0.008)			(0.008)	(0.009)
SREG				-0.520***	-0.593***	-0.625***	-0.610***
				(0.041)	(0.049)	(0.046)	(0.050)
DREG				-0.698***	-0.486***	-0.662***	-0.473***
				(0.081)	(0.098)	(0.086)	(0.100)
Common language				0.458***	0.131	0.221*	0.079
				(0.091)	(0.116)	(0.097)	(0.119)
Common colony				-0.401*	-0.404	-0.136	-0.356
				(0.202)	(0.257)	(0.204)	(0.264)
Common legal origin				-0.042	-0.156#	-0.048	-0.142
				(0.065)	(0.085)	(0.069)	(0.087)
Constant	-16.367***	-14.388***	-15.437***	-10.777***	-7.755***	-5.849***	-6.055**
	(1.881)	(1.384)	(1.936)	(1.413)	(2.080)	(1.446)	(2.200)
N	4369	4787	4002	5251	4369	4787	4002
df_m	12	5	13	9	17	10	18
pseudo-R2	0.32	0.16	0.3	0.22	0.39	0.26	0.37

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets.

Table 4: Determinants of regulatory divergence in services markets

PPML estimation: Dependent variable $DREG^{lev}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	-1.056***	-1.129***	-0.947***	-1.239***	-1.066***	-1.150***	-0.951***
	(0.228)	(0.189)	(0.231)	(0.193)	(0.232)	(0.191)	(0.230)
Rjg	-0.124	-0.189#	-0.143	-0.262**	-0.141	-0.196*	-0.151
	(0.096)	(0.098)	(0.098)	(0.093)	(0.095)	(0.097)	(0.097)
Ris	1.003***	1.123***	0.896***	1.211***	1.009***	1.141***	0.900***
	(0.227)	(0.188)	(0.230)	(0.191)	(0.229)	(0.190)	(0.228)
Rjs	0.043	0.127	0.063	0.167#	0.051	0.127	0.065
	(0.092)	(0.094)	(0.094)	(0.091)	(0.091)	(0.093)	(0.092)
Remote	-0.027***		-0.030***		-0.026***		-0.030***
	(0.005)		(0.005)		(0.005)		(0.005)
Natural	0.006		0.042		0.012		0.043
	(0.025)		(0.027)		(0.026)		(0.028)
SRGDP	-0.006		0.006		-0.006		0.007
	(0.005)		(0.007)		(0.005)		(0.007)
DRGDP	-0.070***		-0.071***		-0.069***		-0.069***
	(0.009)		(0.010)		(0.009)		(0.010)
DPCY	0.024		0.018		0.023		0.022
	(0.042)		(0.045)		(0.042)		(0.045)
SQDPCY	0.018		0.019		0.018		0.018
	(0.012)		(0.013)		(0.012)		(0.013)
DROWPCY	0.119***		0.146***		0.123***		0.151***
	(0.035)		(0.037)		(0.035)		(0.037)
Services share	-0.598***		-0.460**		-0.576***		-0.486**
	(0.137)		(0.159)		(0.140)		(0.162)
GTA_1980		-0.574**	-0.434*			-0.569**	-0.445*
		(0.197)	(0.202)			(0.193)	(0.198)
BTG		-0.010***	-0.009***			-0.009***	-0.009***
		(0.002)	(0.003)			(0.002)	(0.003)
Common language				-0.186***	-0.123**	-0.154***	-0.114**
				(0.036)	(0.041)	(0.037)	(0.042)
Common colony				0.000	-0.020	0.015	0.032
				(0.046)	(0.055)	(0.049)	(0.058)
Common legal origin				0.076**	0.074*	0.095***	0.104***
				(0.026)	(0.029)	(0.027)	(0.031)
Constant	6.900***	5.730***	6.480***	6.637***	7.146***	5.894***	6.507***
	(0.652)	(0.491)	(0.692)	(0.484)	(0.700)	(0.507)	(0.742)
N	4369	4797	4012	5251	4369	4797	4012
df_m	12	6	14	7	15	9	17
r2	0.059	0.02	0.065	0.018	0.062	0.025	0.069

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets. .

Table 5: Explaining the restrictiveness of services regimes in a dyad

	PPML estimation: Dependent variable $SREG^{lev}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	-0.662***	-0.893***	-0.662***	-0.890***	-0.665***	-0.882***	-0.657***
	(0.100)	(0.102)	(0.102)	(0.094)	(0.096)	(0.095)	(0.095)
Rjg	-0.224***	-0.267***	-0.218***	-0.245***	-0.217***	-0.232***	-0.209***
	(0.040)	(0.042)	(0.041)	(0.040)	(0.040)	(0.041)	(0.041)
Ris	0.602***	0.855***	0.603***	0.857***	0.609***	0.849***	0.603***
	(0.098)	(0.101)	(0.101)	(0.093)	(0.095)	(0.094)	(0.094)
Rjs	0.103**	0.159***	0.100*	0.142***	0.096*	0.129**	0.091*
	(0.039)	(0.041)	(0.040)	(0.039)	(0.039)	(0.040)	(0.040)
Remote	0.005*		0.005*		0.005*		0.004#
	(0.002)		(0.002)		(0.002)		(0.002)
Natural	0.012		0.018		0.006		0.015
	(0.011)		(0.012)		(0.011)		(0.012)
SRGDP	0.004*		0.003		0.006**		0.007*
	(0.002)		(0.003)		(0.002)		(0.003)
DRGDP	-0.020***		-0.022***		-0.019***		-0.020***
	(0.004)		(0.004)		(0.004)		(0.004)
DPCY	0.021		0.029		0.026		0.035#
	(0.018)		(0.019)		(0.018)		(0.019)
SQDPCY	0.006		0.004		0.004		0.002
	(0.005)		(0.005)		(0.005)		(0.005)
DROWPCY	0.092***		0.089***		0.093***		0.090***
	(0.015)		(0.016)		(0.015)		(0.016)
Services share	-0.468***		-0.514***		-0.478***		-0.543***
	(0.057)		(0.067)		(0.059)		(0.068)
GTA_1980		-0.133*	-0.129*			-0.144**	-0.139**
		(0.052)	(0.057)			(0.046)	(0.050)
BTG		0.000	0.001			0.001	0.000
		(0.001)	(0.001)			(0.001)	(0.001)
Common language				-0.037*	-0.045*	-0.051**	-0.061***
				(0.016)	(0.018)	(0.017)	(0.018)
Common colony				0.154***	0.096***	0.178***	0.128***
				(0.019)	(0.023)	(0.019)	(0.024)
Common legal origin				0.050***	0.063***	0.062***	0.085***
				(0.011)	(0.012)	(0.012)	(0.013)
Constant	7.799***	7.723***	7.900***	7.542***	7.566***	7.499***	7.553***
	(0.286)	(0.239)	(0.303)	(0.221)	(0.298)	(0.234)	(0.316)
N	4369	4797	4012	5251	4369	4797	4012
df_m	12	6	14	7	15	9	17
r2	0.129	0.065	0.131	0.081	0.14	0.087	0.149

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets.

Table A1: List of countries

Albania, Argentina, Armenia, Australia, Austria, Burundi, Belgium, Bangladesh, Bulgaria, Bahrain, Belarus, Bolivia, Brazil, Botswana, Canada, Chile, China, Cote d'Ivoire, Cameroon, Congo (Democratic Republic), Colombia, Costa Rica, Czech Republic, Germany, Denmark, Dominican Republic, Algeria, Ecuador, Egypt, Spain, Ethiopia, Finland, France, Great Britain, Georgia, Ghana, Greece, Guatemala, Honduras, Hungary, Indonesia, India, Ireland, Iran, Italy, Jordan, Japan, Kazakhstan, Kenya, Kyrgyz Republic, Cambodia, South Korea, Kuwait, Lebanon, Sri Lanka, Lesotho, Lithuania, Morocco, Madagascar, Mexico, Mali, Mongolia, Mozambique, Mauritius, Malawi, Malaysia, Namibia, Nigeria, Nicaragua, the Netherlands, Nepal, New Zealand, Oman, Pakistan, Panama, Peru, the Philippines, Poland, Portugal, Paraguay, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sweden, Thailand, Trinidad & Tobago, Tunisia, Turkey, Tanzania, Uganda, Ukraine, Uruguay, USA, Uzbekistan, Venezuela, Vietnam, Yemen, South Africa, Zambia, Zimbabwe

Table A2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
		Geography			
Distance (km)	5253	7619.9	4313.8	139.0	19812.0
NAT	5253	-8.7	0.8	-9.9	-4.9
REM	5253	1.9	3.7	0.0	9.5
		Economic			
rgdp_p (USD bn)	5253	291.0	832.0	1.0	5700.0
rgdp_r (USD bn)	5253	206.0	437.0	1.0	5700.0
SRGDP	5253	49.2	2.5	42.2	57.8
DRGDP	5253	2.1	1.5	0.0	8.7
pcrgdp_p (USD)	5253	8210.5	9900.0	404.4	59557.4
pcrgdp_r (USD)	5253	8437.7	9047.7	404.4	59557.4
DPCY	5253	1.5	1.0	0.0	5.0
SQDPCY	5253	3.2	3.9	0.0	24.9
DROWPCY	5253	1.1	0.5	0.0	2.7
		Institutional			
stri_r	5253	27.7	15.1	6.2	88.2
stri_p	5253	29.0	14.6	6.2	88.2
DREG	5253	0.6	0.4	0.0	2.7
SREG	5253	6.4	0.7	4.2	8.7
$SREG^{lev}$	5253	56.7	20.9	17.1	153.9
Com_lang	5253	0.1	0.3	0.0	1.0
Com_col	5253	0.1	0.2	0.0	1.0
Com_law	5253	0.3	0.5	0.0	1.0
STA	5253	0.1	0.3	0.0	1.0
		Political economy			
Services trade_r (real USD bn)	5091	3.9	8.5	0.0	54.0
Services trade_p (real USD bn)	5060	4.8	10.6	0.0	54.0
BTG (real USD bn)	4799	0.2	1.3	0.0	50.5
GTA_1980	5253	0.002	0.044	0	1
$\min(Trade^{Ser})$	5248	19.7	1.4	16.6	24.7
$\max(Trade^{Ser})$	5248	21.6	1.6	16.6	24.7

Table A3: Robustness results from estimating equation (1)

Probit estimation: Dependent variable STA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	1.181	1.487*	1.150	0.649	0.421	0.602	0.324
	(0.762)	(0.601)	(0.767)	(0.700)	(0.867)	(0.679)	(0.878)
Rjg	0.742**	0.824***	0.730**	1.029***	0.570*	0.664**	0.550*
	(0.253)	(0.217)	(0.251)	(0.222)	(0.271)	(0.235)	(0.272)
Ris	-1.090	-1.410*	-1.056	-0.535	-0.388	-0.570	-0.297
	(0.756)	(0.592)	(0.759)	(0.696)	(0.864)	(0.672)	(0.873)
Rjs	-0.692**	-0.742***	-0.673**	-0.926***	-0.628*	-0.678**	-0.616*
	(0.238)	(0.208)	(0.236)	(0.214)	(0.255)	(0.222)	(0.255)
Remote	0.021#		0.020#		0.032*		0.031*
	(0.012)		(0.012)		(0.013)		(0.014)
Natural	0.183**		0.100		0.233**		0.150*
	(0.067)		(0.069)		(0.071)		(0.075)
SRGDP	0.104***		0.042*		0.125***		0.051*
	(0.016)		(0.021)		(0.019)		(0.025)
DRGDP	-0.089**		-0.080**		-0.124***		-0.114***
	(0.028)		(0.029)		(0.032)		(0.033)
DPCY	0.217		0.210		0.268		0.257
	(0.156)		(0.157)		(0.165)		(0.166)
SQDPCY	-0.109*		-0.114*		-0.085		-0.091
	(0.053)		(0.054)		(0.055)		(0.055)
DROWPCY	-0.164		-0.203#		-0.207		-0.258#
	(0.107)		(0.106)		(0.135)		(0.134)
Services share	2.016***		1.247**		1.683***		0.744
	(0.395)		(0.431)		(0.455)		(0.504)
BTG		0.043***	0.036***			0.052***	0.047***
		(0.007)	(0.010)			(0.008)	(0.012)
SREG				-0.473***	-0.556***	-0.556***	-0.594***
				(0.050)	(0.055)	(0.054)	(0.059)
DREG				-0.496***	-0.442***	-0.471***	-0.431***
				(0.094)	(0.104)	(0.099)	(0.109)
Common language				0.342**	0.212#	0.173	0.136
				(0.109)	(0.129)	(0.117)	(0.134)
Common colony				-0.051	-0.030	0.132	-0.012
				(0.190)	(0.244)	(0.196)	(0.255)
Common legal origin				-0.118	-0.214*	-0.111	-0.200*
				(0.083)	(0.099)	(0.087)	(0.101)
Constant	-10.797***	-7.946***	-8.573***	-4.128*	-3.966	-0.877	-0.481
	(2.297)	(1.692)	(2.350)	(1.650)	(2.414)	(1.723)	(2.594)
N	4139	4520	3783	4973	4139	4520	3783
df_m	12	5	13	9	17	10	18
pseudo-R2	0.11	0.06	0.11	0.11	0.19	0.15	0.20

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets. Sample restricted to dyads for which an STA entered in force in the year 2008 and beyond.

Table A4: Robustness results from estimating equation (2)

	PPML estimation: Dependent variable $DREG^{lev}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	-1.070***	-1.164***	-0.944***	-1.270***	-1.079***	-1.182***	-0.946***
	(0.224)	(0.180)	(0.225)	(0.183)	(0.228)	(0.182)	(0.225)
Rjg	-0.048	-0.068	-0.066	-0.120	-0.068	-0.077	-0.078
	(0.101)	(0.103)	(0.104)	(0.099)	(0.100)	(0.102)	(0.102)
Ris	1.037***	1.194***	0.914***	1.283***	1.041***	1.210***	0.916***
	(0.222)	(0.179)	(0.224)	(0.182)	(0.226)	(0.181)	(0.223)
Rjs	-0.006	0.059	0.014	0.085	0.004	0.061	0.019
	(0.097)	(0.100)	(0.100)	(0.096)	(0.096)	(0.099)	(0.098)
Remote	-0.020***		-0.022***		-0.020***		-0.022***
	(0.005)		(0.005)		(0.005)		(0.005)
Natural	0.029		0.071**		0.039		0.075**
	(0.026)		(0.027)		(0.026)		(0.028)
SRGDP	-0.001		0.015*		-0.001		0.016*
	(0.005)		(0.007)		(0.005)		(0.007)
DRGDP	-0.075***		-0.076***		-0.074***		-0.075***
	(0.009)		(0.010)		(0.009)		(0.010)
DPCY	0.000		-0.009		-0.003		-0.008
	(0.043)		(0.046)		(0.043)		(0.046)
SQDPCY	0.021#		0.023#		0.022#		0.023#
	(0.012)		(0.013)		(0.012)		(0.013)
DROWPCY	0.140***		0.169***		0.144***		0.173***
	(0.034)		(0.036)		(0.034)		(0.037)
Services share	-0.414**		-0.232		-0.383**		-0.256
	(0.141)		(0.165)		(0.144)		(0.167)
BTG		-0.008***	-0.011***			-0.007***	-0.011***
		(0.002)	(0.003)			(0.002)	(0.003)
Common language				-0.170***	-0.134**	-0.147***	-0.124**
				(0.036)	(0.042)	(0.037)	(0.043)
Common colony				-0.016	-0.043	0.003	0.012
				(0.046)	(0.055)	(0.049)	(0.059)
Common legal origin				0.075**	0.070*	0.094***	0.101**
				(0.027)	(0.030)	(0.028)	(0.031)
Constant	6.053***	4.399***	5.428***	5.111***	6.385***	4.557***	5.560***
	(0.663)	(0.513)	(0.708)	(0.504)	(0.702)	(0.526)	(0.747)
N	4139	4520	3783	4973	4139	4520	3783
df_m	12	5	13	7	15	8	16
r2	0.049	0.014	0.056	0.015	0.053	0.019	0.061

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets. Sample restricted to dyads for which an STA entered in force in the year 2008 and beyond.

Table A5: Robustness results from estimating equation (3)

	PPML estimation: Dependent variable $SREG^{lev}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rig	-0.675***	-0.924***	-0.666***	-0.914***	-0.678***	-0.910***	-0.660***
	(0.097)	(0.101)	(0.098)	(0.092)	(0.094)	(0.093)	(0.092)
Rjg	-0.208***	-0.244***	-0.202***	-0.214***	-0.204***	-0.208***	-0.197***
	(0.044)	(0.046)	(0.045)	(0.044)	(0.044)	(0.045)	(0.044)
Ris	0.628***	0.902***	0.620***	0.898***	0.633***	0.892***	0.618***
	(0.096)	(0.099)	(0.097)	(0.090)	(0.093)	(0.092)	(0.091)
Rjs	0.106*	0.162***	0.103*	0.138**	0.101*	0.131**	0.097*
	(0.042)	(0.045)	(0.043)	(0.043)	(0.042)	(0.044)	(0.043)
Remote	0.009***		0.009***		0.008***		0.008***
	(0.002)		(0.002)		(0.002)		(0.002)
Natural	0.030**		0.041***		0.025*		0.039**
	(0.011)		(0.012)		(0.012)		(0.012)
SRGDP	0.008***		0.008**		0.009***		0.012***
	(0.002)		(0.003)		(0.002)		(0.003)
DRGDP	-0.022***		-0.024***		-0.021***		-0.023***
	(0.004)		(0.004)		(0.004)		(0.004)
DPCY	0.006		0.012		0.010		0.017
	(0.018)		(0.019)		(0.018)		(0.019)
SQDPCY	0.008		0.007		0.007		0.005
	(0.005)		(0.005)		(0.005)		(0.005)
DROWPCY	0.103***		0.101***		0.104***		0.102***
	(0.015)		(0.016)		(0.015)		(0.016)
Services share	-0.352***		-0.380***		-0.363***		-0.414***
	(0.059)		(0.069)		(0.061)		(0.071)
BTG		0.001#	-0.000			0.002#	-0.001
		(0.001)	(0.001)			(0.001)	(0.001)
Common language				-0.027#	-0.049**	-0.045**	-0.066***
				(0.016)	(0.018)	(0.017)	(0.019)
Common colony				0.144***	0.079***	0.170***	0.112***
				(0.019)	(0.023)	(0.019)	(0.023)
Common legal origin				0.050***	0.060***	0.063***	0.083***
				(0.011)	(0.013)	(0.012)	(0.013)
Constant	7.317***	7.183***	7.313***	6.936***	7.166***	6.943***	7.056***
	(0.294)	(0.252)	(0.312)	(0.233)	(0.303)	(0.245)	(0.321)
N	4139	4520	3783	4973	4139	4520	3783
df_m	12	5	13	7	15	8	16
r2	0.123	0.049	0.126	0.065	0.132	0.071	0.144

Note: Levels of significance: #10% * 5% **1% ***0.1%; standard errors, clustered by dyad, reported in brackets. Sample restricted to dyads for which an STA entered in force in the year 2008 and beyond.