Providing Protection: Agricultural Support and the Flexibility of Preferential Trade Agreements in Democracies

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Jeheung Ryu

University of Rochester

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Abstract

What explains the variations in escape clauses in trade agreements? This paper examines how agricultural support affects the design of preferential trade agreements (PTAs). I hypothesize that democratic political elites with survival incentives choose flexible trade agreements as they are concerned more about domestic agricultural sectors. Flexible design of treaties enables members to shirk their contractual duties temporarily and can be often used as protectionist measures. To validate this argument, I construct a measure of flexibility using a Bayesian item response theory that treats flexibility as a latent characteristic of trade agreements. With this index and panel data covering 648 PTAs signed from 1948-2017, I find that political leaders are more likely to introduce flexibility provisions when entering into trade agreements as they confer more agricultural subsidies to farmers. In addition to providing a continuous index to measure PTA flexibility, the paper introduces a robust predictor of trade agreement flexibility that has been overlooked in previous work.

Contents

1 Introduction

The focus of trade liberalization has shifted from multilateral to regional negotiations, and the resulting proliferation of preferential trade agreements (PTAs) has inspired a growing body of research. Agricultural interests have largely escaped notice in the recent literature on the design of PTAs, however. This is surprising, because the progress of multilateral trade negotiations has been blocked in large part by agricultural protectionism, and a well-developed body of literature studies political support for agriculture. This paper argues that the strength of agricultural interests plays a key role in determining the design of flexibility mechanisms in PTAs. Political leaders prioritize agricultural interests because most democratic election rules over-represent rural populations, and the degree of agricultural power depends on the degree of this malapportionment. Agricultural interests are not consistently protectionist, but they lobby for flexibility provisions as a form of insurance against the price volatility that is characteristic of agricultural production.

Why do farmers continue to hold political influence in democracies out of proportion to their share of the population even while their economic role has declined? Some accounts of agricultural influence focus on the organization of interest groups (Abler 1991; Hansen 1991; Sheingate 2003; Gawande and Hoekman 2006), but this does not explain persistence of influence in the face of demographic change. Building on work on the effects of domestic institutions on agricultural policies, this study argues that domestic agricultural bias is mainly driven by the overrepresentation of agricultural population in electoral districts.[1] As the discrepancy between the share of legislative seats and the share of population in geographical districts is widespread in democracies (Samuels and Snyder 2001), rural voters have greater weight than their urban counterparts. It is thus cost-effective for political leaders to appeal to a small subset of the population by providing agricultural subsidies to farmers at the expense of consumers and general taxpayers.

Besides agricultural subsidies, political leaders also seek to find trade defensive mechanisms for farmers. Despite the importance of this dramatic transition to regionalism, relatively little study has been conducted on how domestic agricultural protection affects bilateral- or regional-level trade agreements. This lack of emphasis on political considerations for trade defensive mechanisms of

1. Others focus on how different electoral systems shape politicians' incentives on agricultural support policies, although their empirical findings are mixed (Persson and Tabellini 1999; Rogowski and Kayser 2002; Bawn and Thies 2003; Park and Jensen 2007; Broz and Maliniak 2010).

PTAs is understandable if the determinants of PTAs are exclusively economic. However, domestic politics do matter and reelection incentives drive political actors to design PTAs in certain ways to benefit domestic constituencies. Identifying roles and preferences of domestic electorates, some scholars began to examine how domestic politics affect the design of PTAs (Kucik 2012; Allee and Elsig 2017).

Trade politics is not simply about protection and liberalization; politicians erect trade barriers to insulate the domestic market from price volatility. Indeed, flexibility provisions are key components of the deal that opens up markets when countries enter into trade agreements. Defensive mechanisms include "escape clauses"—antidumping, safeguards, and countervailing duties—that allow countries to temporarily suspend their contractual duties, and these provisions increase the flexibility of the agreement by granting political leaders more discretion (Rosendorff and Milner 2001). Trade-defensive mechanisms in PTAs are particularly important to agricultural interests, because fluctuations in the weather and in commodity prices expose agricultural producers to substantial financial risk. Consequently, democratic political leaders make efforts to include higher levels of flexibility in trade agreements when the domestic agricultural sector is politically influential. The institutional foundation of agricultural power is malapportioned electoral districts, which create a rural bias in representation.

To validate the main argument of how agricultural protection affects the design of PTAs, I use data on 648 PTAs from 1948-2017 from the Design of Trade Agreements (DESTA) database (Dür, Baccini, and Elsig 2014)[2] and construct a latent measure of treaty flexibility using Bayesian Item Response Theory (IRT). This approach improves over studies using additive composite measures of flexibility (Kucik 2012; Dür, Baccini, and Elsig 2014; Allee and Elsig 2017), because it makes use of more information, allows different provisions to assume different weights in the index, and generates a continuous measure that facilitates use of fixed effects and more complex estimators. Using this measure of flexibility, I demonstrate strong empirical evidence that higher levels of agricultural subsidies are associated with more flexible regional trade agreements. To address concerns about potential endogeneity bias, I further use a malapportionment measure to instrument for the agricultural subsidies, finding substantively similar effects on the likelihood of including more flexible provisions in PTAs. This provides evidence consistent with the proposed mechanism

2. Source: https://www.designoftradeagreements.org

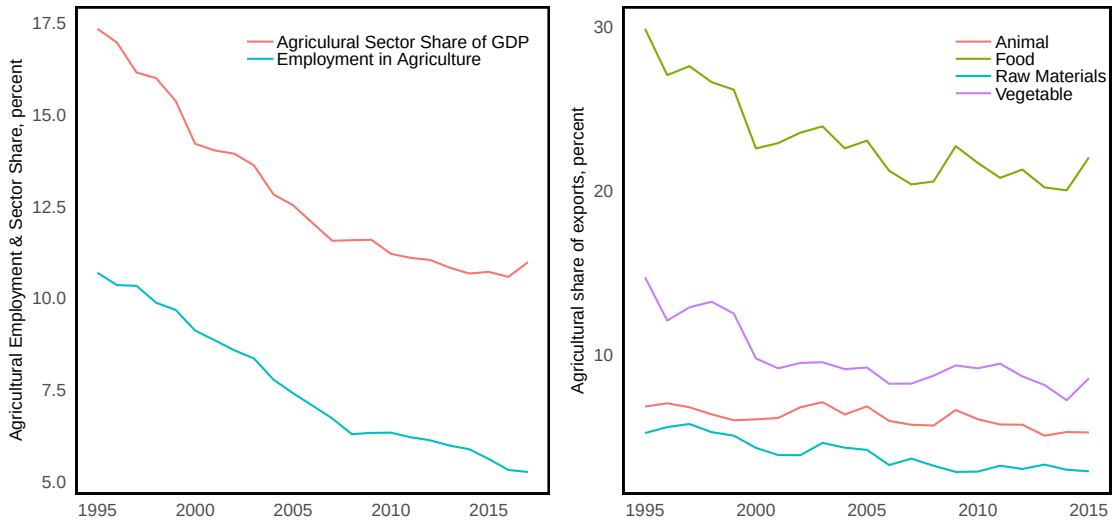
that links malapportionment to defensive mechanisms of PTAs, using agricultural support as a mediating variable.

This study makes three contributions to scholarship on the design of international treaties. First, this study provides systematic analyses of the relationship between domestic agricultural protection and the flexible design of PTAs in democratic countries. Despite an abundance of research on the effects of agricultural issues on multilateral trade agreements, existing studies largely ignore this link. Second, while the existing literature has typically explained the design of trade agreements comparatively little research has focused on developing an index to measure the degree of treaty designs. A latent measure of flexibility I create in this study is advantageous in analyzing large-N studies because its continuous measure provides more variations between PTAs. In addition, a Bayesian IRT produces two characteristic parameters, which provide more information about PTAs. Finally, by providing robust evidence using an instrumental variable, this paper demonstrates a robust finding linking agricultural support and trade defensive mechanisms in PTAs.

2 Agricultural Bias, Subsidies and PTA Flexibility

2.1 Democratic Rural Bias and Agricultural Support

Rural bias is prevalent in democracies, where agricultural producers are sheltered by politicians from market competition. Political leaders in democracies are more responsive to rural constituencies than to their urban counterparts in their policymaking because electoral rules favoring the rural population help farmers gain political allies to support their demands. In developing countries with large rural majorities, this is a matter of catering to the median voter. According to the work of Varshney (1998), for instance, farmers became an important political group in India's electoral calculus soon after independence. The specific focus of rural bias was on tax incentives offered to agricultural groups. Although the agricultural sector in India accounts for 35 percent of national income, farmers generate less than 11 percent of tax revenue, so farmers are substantially exempted from income taxes. Farmers also enjoy subsidized utility rates for water and electricity, and subsidized lending by public banks (Cole 2009). Kasara (2007) also finds a rural bias in African countries, where democratic regimes impose lower taxes on crop production. In contrast to the



Source: COMTRADE data in the World Integrated Trade Solution (WITS) and World Development Indicators (WDI) in the World Bank

Figure 1: The Declining Share of Agriculture in Employment, GDP, and Merchandise Exports for Democratic Countries, 1995-2015

standard accounts of urban bias in authoritarian regimes in African countries,[3] more political and electoral competition in rural areas incentivizes democratic leaders to provide benefits to rural voters as the regimes become democratized. In a similar vein, Stasavage (2005) finds that democratic governments are responsive to the preferences of rural voters on public education spending in Africa. Since the majority of the electorate lives in rural regions in Africa, rural demands are more likely to be reflected in governments' public policies.

All else equal, politicians seeking to stay in office have an incentive to seek favor with the voters by conferring rents on them. The rural bias is not limited to cases in India or recently-democratized countries in Africa. "Virtually all democracies provide generous support for their farmers through trade policies, direct subsidies, and various other programs" (Persson and Tabellini 2002). As noted by Gardner (1992), it is reasonable for politicians to intervene in agricultural affairs when a substantial majority of the population lives in rural areas and there is a substantial income gap between agricultural and non-agricultural sectors. However, countries with advanced democracy

3. According to the urban bias arguments by Lipton et al. (1977), Schultz (1977), and Bates (1981), authoritarian incumbents have incentives to favor the urban population because they can either present a more credible political threat or provide reliable support. Potential political unrest is more likely to arise from the concentration of citizens in densely populated cities than rural regions. For recent works on urban political bias, see Wallace (2013), Hendrix and Haggard (2015), and Ballard-Rosa (2016)

and a high level of economic development consistently provide assistance to farmers even after rural populations decline (Anderson and Hayami 1986).

In Figure 1, the left panel shows that the agricultural sector's share of gross domestic product (GDP) in democracies has fallen from about 17.5% in 1995 to around 11% in 2015. Mirroring that decline, the share of employment in the agricultural sector has fallen by more than half since 1995, dropping from around 11% to little more than 5%. The right panel displays the agricultural share of exports for several agricultural commodities. Regardless of the product type, these commodities' shares of exports exhibit a declining trend. Given the small and declining importance of agriculture in the economy, it may seem surprising that political leaders care so much about agricultural issues and continue to provide subsidies to farmers.

A well-developed body of literature provides explanations for the consistent support for agricultural production in economically advanced democracies. Some scholars contend that lobbying advantages of agricultural interest groups increase agricultural support (Abler 1991; Hansen 1991; Sheingate 2003; Gawande and Hoekman 2006). These arguments generally rely on two theoretical foundations. First, according to the logic of collective action (Olson 1965), farmers have mobilizational advantages compared to consumers or taxpayers because of the homogeneity of their economic activities. Farmers that engage in the production of the same agricultural products have common economic interests, which reduces the costs of organization (Persson and Tabellini 2002). Second, according to "demand-side" policy-making models (Grossman and Helpman 1994; Lee and Swagel 1997), politicians maximize their objective functions by balancing political contributions by lobbies against voters' aggregate welfare. Interest groups exert influence over trade policy by making political contributions. The existing literature elaborates a theory of the activities of lobbying groups (Mitra 1999; Gawande and Bandyopadhyay 2000; Gawande and Hoekman 2006).[4,5]

Although explanations on agricultural lobbying activities provide useful frameworks to analyze what causes consistent rural support in democracies, this approach has practical limitations. Since

4. Unfortunately, due to a lack of comprehensive data on agricultural interest groups and their lobbying activities, empirical findings are usually limited to the U.S. case.

5. Other scholars focus on how legislators' preferences influence agricultural protection (Vesenka 1989; Abler 1991; Bellemare and Carnes 2015). Identifying legislators' personal ideological convictions or predispositions as a determinant of agricultural support, these studies seek to provide micro-level explanations using data on U.S. roll call votes. For instance, Bellemare and Carnes (2015) investigates two agricultural bills, the 2002 Farm Security and Rural Investment (FSRI) Act and the 2008 Food, Conservation, and Energy (FCE) Act, and analyzes data on the voting behavior of 783 lawmakers who previously worked as farmers.

data on lobbying activities is limited to the U.S. after passage of the Lobbying Disclosure Act of 1995, it does not allow for comparative analysis on interest-group activities. Voting data on legislators in the world is also very limited and labor-intensive to gather, if not impossible, to explore how individual ideological convictions affect agricultural support. This naturally leads us to focus on institutional systems of democracies.

2.2 Agricultural Bias and Malapportioned Representation

A variety of arguments have sought to link majoritarian or proportional electoral institutions to persistent distributional policies. For example, Persson and Tabellini (1999) compare majoritarian and proportional systems and argue that distributional policies tend to be targeted to voters in majoritarian systems. In contrast, Bawn and Thies (2003) claim that legislators are more likely to be responsive to diffuse interests than organized ones in majoritarian systems. Since legislators in majoritarian systems have incentives to cultivate a personal vote, they focus more on broadly shared interests. Rogowski and Kayser (2002) make similar arguments and argue that majoritarian systems prioritize broadly-defined consumers because of high seat-vote elasticities. On the other hand, Park and Jensen (2007) argue that electoral systems that encourage politicians to appeal to narrow constituencies tend to have more agricultural subsidies.[6]

This paper takes a different approach to explaining rural bias in democracies, focusing on malapportionment of representation. Malapportionment arises when the share of legislative seats allocated to geographical units differs from the share of voters in those districts, so that the votes of some voters count more than those of others. The normative concerns caused by such disparities not only conflict with a belief that democratic institutions should provide voters with an equal vote (Balinski and Young 1982; Verba, Schlozman, and Brady 1995), but also have important socio-economic consequences (Stewart and Weingast 1992; Lee 1998, 2000; Rodden 2002; Hauk Jr, Wacziarg, et al. 2007). In the case of the U.S., Lee (1998) shows that the distributions of federal funds are biased towards overrepresented states. Malapportionment is an almost universal feature of democratic systems, but the degree of malapportionment varies substantially. Assigning two senators to every state without considering the geographical distribution of the population

6. Other work studies political institutions from a different angle and investigate how the number of veto players affects producer supports (Thies and Porche 2007).

makes the Senate one of the most rural-biased chambers in the world (Samuels and Snyder 2001). This disparity is not limited to the U.S., however, and we can find similar effects in other countries. Through a series of enlargement procedures, the EU transfers a larger share of fiscal benefits to small member countries with stronger representation in terms of per capita voting power (Rodden 2002). The disproportional transfer of benefits also occurs domestically in Germany. Pitlik, Schneider, and Strotmann (2006) show empirically that malapportionment in the German upper house leads to disproportional state shares of per capita transfers. It is generally believed that the widespread malapportionment is largely caused by a dramatic demographic change as a result of urbanization, which leads to overrepresentation of the rural population. It seems obvious that malapportioned electoral districts are a dominant feature of upper chambers; in many countries, however, lower chambers have similarly malapportioned systems (Samuels and Snyder 2001). As noted in the previous literature, malapportionment has unequal distributional outcomes that favor voters in rural areas (Jackman 1994; Lee 1998; Horiuchi and Saito 2003; Horiuchi and Lee 2008). For example, as Thies (1998) shows, Japan and the U.S. continued agricultural-support spending even after mass movements of rural population toward the cities.

In this paper, I investigate how malapportioned representation affects agricultural support, and further influences trade defensive mechanisms of PTAs. Generally, in response to protectionist demands from domestic farmers, the government uses various protectionist tools such as import tariffs, quotas, or export subsidies to insulate the agricultural market from price influences abroad. As a result, this government intervention causes substantial trade-distorting effects in the world price of agricultural commodities. Combined with these protectionist measures, agricultural subsidies typically raise domestic consumer prices of agricultural products and thus induce overproduction. Governments thus have to find ways to sell surplus products, and they end up trading them below the international market price at a loss, which distorts the world market price (Anderson and Martin 2005).

2.3 Agricultural Protectionism and Treaty Flexibility

While most democratic countries are reluctant to compromise on agricultural subsidies, their distortionary price effects damage farmers in other countries. Therefore, countries have made efforts to regulate agricultural subsidies and tariffs through multilateral negotiations. However, it was

only with the establishment of the WTO in 1995 that agricultural trade was brought under multilateral discipline through the Uruguay Round Agreement on Agriculture (URAA). Through the URAA, developing countries have expected to get access to the highly protected markets of wealthy countries, but developed countries have been unwilling to open their domestic agricultural markets. In spite of continuous negotiations, the level of agricultural protection still remains high, and this thorny issue has blocked progress in the current multilateral trade round, the Doha Development Agenda.

After witnessing the failure of multilateral trade negotiations, countries have turned their attention to bilateral and regional trade agreements. Accordingly, the number of PTAs has dramatically grown in the recent two decades (Mansfield and Pevehouse 2013; Mansfield and Milner 1999). Figure 2 shows the geographical distribution of PTAs signed from 1948-2017. As shown in the Figure 2, most countries in the world are members of regional-level trade institutions. Instead of relying on multilateral forums for trade liberalization, countries seek to further their access to international markets through regional approaches, which are less costly to negotiate and more ambitious in terms of the depth and scope of trade liberalization (Schwab 2011). Pairs of democracies are involved in more liberal trade agreements and have lower tariffs (Mansfield, Milner, and Rosendorff 2000; Milner and Kubota 2005). Given the spread of this new trend, how have countries maintained agricultural protection mechanisms while pursuing trade liberalization within the framework of PTAs? Regional liberalization raises the stakes for the institutional design of PTAs, and a degree of flexibility may be the necessary concession to achieve liberalization (Rosendorff and Milner 2001).[7] Compared to multilateral trade treaties like the General Agreement of on Tariffs and Trade (GATT), the institutional design of bilateral- and regional-level treaties are more deliberate because the limited number of members enables them to better reflect countries' preferences.[8]

PTAs differ greatly in their designs (Koremenos, Lipson, and Snidal 2001; Rosendorff and Mil-

7. A growing body of research has begun to study the design of PTAs focusing on specific aspects such as depth and scope (Frankel, Stein, and Wei 1997; Baccini 2010; Hicks and Kim 2012; Mansfield and Milner 2012; Dür, Baccini, and Elsig 2014; Baccini, Dür, and Elsig 2015). Kucik (2012) argues that the optimal level of flexibility in PTA design is a function of competition between import-competing and export-dependent industries. More recently, Allee and Elsig (2017) argues that veto players are the key determinants of PTA design and shows that greater veto-player constraints lead to less liberalization, weaker dispute settlement, and more flexible treaties.

8. This study follows the tradition of the rational-choice approach to the design of international institutions in that "states use international institutions to further their own goals, and they design institutions accordingly" (Koremenos, Lipson, and Snidal 2001). For more work detailing the Rational Design project, see a special issue of *International Organization* (Autumn 2001, Volume 55, Issue 4).

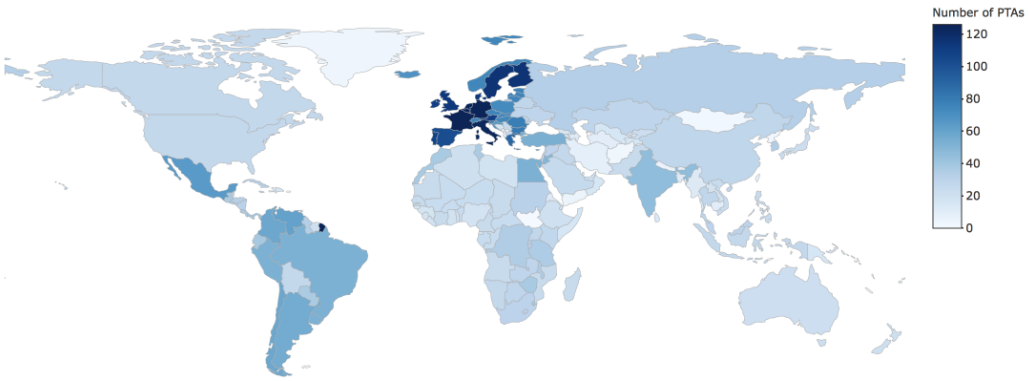


Figure 2: The Number of Preferential Trade Agreements, 1948-2017

ner 2001; Koremenos 2005). The differences of each PTA in the scope of covered topics, the depth of trade liberalization, dispute settlement mechanisms, the level of flexibility, and membership are due largely to domestic demands (Koremenos, Lipson, and Snidal 2001).[9] Among these dimensions, this study focuses on the variations of PTA designs in terms of flexibility. While seeking deeper liberalization of trade through PTAs, political leaders have to find a way to protect rural coalitions which remain largely opposed to liberalizing domestic markets. As flexible designs of PTAs can be generally used as defensive mechanisms, including more flexibility provisions can help political leaders to appease farmers. According to Koremenos, Lipson, and Snidal (2001), flexibility refers to institutional rules or procedures that enable countries to cope with unanticipated circumstances, external shocks, or new demands from domestic coalitions.[10] In other words, flexibility allows member countries to bend the rules temporarily. More formally, it is "any provision of an international agreement that allows a country to suspend the concessions it previously negotiated without violating or abrogating the terms of the agreement (Rosendorff and Milner 2001)." Flexibility design is the prominent feature of most trade agreements. Then how is this flexibility design related to the protectionist mechanisms in agriculture?

9. The approach of Koremenos, Lipson, and Snidal (2001) to explain variation in institutional design considers the following six variables: distributional problems, enforcement problems, number of actors and the asymmetries among them, uncertainty about behavior, the state of the world, and others' preferences.

10. Koremenos, Lipson, and Snidal (2001) defines two types of flexibility: adaptive and transformative one. "Escape clauses" are an example of adaptive flexibility. Treaties with escape clauses allows members to suspend certain duties of the treaties in the face of external shocks or domestic circumstances. "Sunset provisions" are an example of transformative flexibility. They permit members to terminate the concessions or conditions of the treaties within limited amount of period. For the purpose of this study, I focus on the adaptive flexibility.

Volatility in agricultural commodity markets makes flexibility mechanisms particularly valuable to the agriculture sector. Over the last several decades, the world has experienced periodic spikes and plunges in the prices of major agricultural products such as corn, soybeans, wheat and rice (Trostle 2010). There are many factors contributing to the dramatic changes in these products. On the supply side, agricultural production cannot rapidly react to market conditions. On the demand side, factors such as the production of biofuel, using food crops as feed, and the rising demand from India and China contribute to unstable market price conditions (Trostle 2010). The high volatility of the world price of agricultural commodities causes uncertainty and vulnerability to producers. In the face of adverse market conditions, domestic agricultural groups increase their demands for protection and political leaders respond to these demands to earn support from rural voters. When entering into trade agreements, democratic countries with a rural bias seek to find ways to satisfy domestic agricultural constituents by including more defensive mechanisms in treaties to cope with unexpected emergencies.

An additional argument for flexibility mechanisms as the protectionist tool of choice relies on voters' bounded rationality. The median voter prefers liberal trade policies that lower import prices and raise real incomes. According to a study by Kono (2006), however, the incentive for democratic leaders to liberalize trade depends on the transparency of trade policy, because voters have imperfect information (Mansfield, Milner, and Rosendorff 2002). Among the broadly used forms of protection, tariffs have straightforward effects for consumers as import tariffs directly raise domestic consumer prices. In contrast, while nontariff barriers such as antidumping, countervailing duties and quantity controls raise import prices, they raise fewer objections because consumers do not have perfect information about their price effects. Therefore, it is optimal strategy for political leaders to introduce more flexibility provisions to protect domestic farmers because lower tariffs satisfy general voters, whereas nontariff barriers provide protection for farmers. With these "optimal obfuscation" policies, political leaders can balance the interests of general consumers with those of agricultural producers and maximize their political support (Magee, Brock, and Young 1989; Kono 2006).

In summary, I argue that democratic political leaders provide protection for domestic agricultural groups in exchange for electoral support. In particular, agricultural interests lobby for flexibility mechanisms in regional trade agreements because agricultural production is subject to

price volatility. The degree of rural influence in politics is a function of the malapportionment of representation. This leads to the following hypothesis:

Hypothesis1: In democracies, political leaders become more likely to include flexibility mechanisms in PTAs as the power of domestic agricultural groups grows.

3 Measuring Flexibility of PTAs

3.1 Previous Measures of Flexibility

A small but burgeoning literature studies treaty flexibility empirically in the field of international political economy. Kucik and Reinhardt (2008) explores how domestic flexibility mechanisms measured by antidumping provisions promote cooperation. In this study, they operationalize cooperation by joining the WTO and agreeing on lower tariff bindings and find that countries joining the WTO are more likely to adopt domestic antidumping mechanisms, and in turn they are more likely to agree on tariff rates. Other works on flexibility mainly focus on trade agreements. Baccini (2010) examines how the European Union (EU) finds trade partners. The EU is concerned with economic and political transparency of potential trade partners because successful transition to the market economy guarantees credible commitments. This study argues that the EU does not allow potential trade partners to retain high levels of flexibility when they show a low level of transparency. Other work by Kucik (2012) studies the determinants of flexibility in PTAs. In this article, he examines the domestic distributional concerns of import-competing and export-driven industries and finds that the level of flexibility of PTAs is determined by the composition of these two sectors. Finally, an article by Baccini, Dür, and Elsig (2015) tests the hypothesis about the relationship between depth and flexibility of PTAs. The mechanism behind this is that flexibility provisions can play a role as a safety device that allows countries to respond to domestic contingencies without violating the substantial terms of an agreement. They test this hypothesis using their new dataset and find that deep trade agreements tend to be more flexible especially in non-democratic countries.

Although these studies have provided some empirical evidence for the conjectures of the rational treaty design approach (Koremenos, Lipson, and Snidal 2001), their operationalizations of

flexibility vary substantially. First, some scholars only use a subset of escape clauses to define flexibility. For example, Kucik and Reinhardt (2008) mainly consider antidumping provisions. They gather information on whether countries have antidumping regulations in their domestic judicial system and create a binary indicator that shows whether a country has antidumping laws in a certain year. Similarly, Baccini (2010) chooses antidumping and safeguard measures to create a measure of flexibility. He mainly counts the number of antidumping and safeguard provisions in the PTA texts and operationalizes flexibility using formula he proposes. These approaches come with substantial drawbacks. If one only considers a subset of escape clauses, it could lead to biased results because some countries may prefer a certain type of escape clauses over others. With this partial consideration, one is also likely to miss variations within each PTA. Second, others consider a broader range of escape clauses and define flexibility based on their own coding of PTAs. Kucik (2012) gathers information on 330 PTAs from the WTO's Regional Trade Agreement Database[11] and codes PTA flexibility based on five procedural rules of three each escape clauses.[12] Baccini, Dür, and Elsig (2015) use a similar approach. They analyze 587 PTA texts and code more than 100 items.[13] These studies measure the same dimension of flexibility, but use different components.

Although these measures are extensive in scope and provide some degree of variation, they do not properly capture the characteristics of treaty flexibility. A simple additive measure assumes that there are no individual differences in components. The composite measure does not consider obvious differences among escape clauses and does not explain which clauses contribute more or less to the sum score.

3.2 Measuring Flexibility Using Bayesian IRT Models

To overcome the drawbacks identified in the previous measures of flexibility, I create a new measure of treaty flexibility using a Bayesian IRT model. In fact, there are several methods available to use to make this index. For instance, one popular approach is factor analysis methods and it is less intensive in terms of computation (Clinton, Jackman, and Rivers 2004). Factor analysis is

11. Source: https://www.wto.org/english/tratop_e/region_e/region_e.htm

12. For example, Kucik (2012) codes safeguard measures based on the following five criteria: investigation is required for authorization; safeguards are eligible for dispute settlement; state must demonstrate injury; limit on size of safeguard measure; and limit on duration of safeguard measure.

13. They consider the presence of absence of suspension of tariff cuts in the case of balance of payments problems, a safeguard provision, a provision allowing for a safeguard measure, a provision allowing for an imposition of countervailing duties, and a provision allowing for an imposition of antidumping duties.

fundamentally about correlations among individual responses. When forming a correlation matrix, information on individual level correlation is lost and as a result, factor analysis makes it difficult to learn about estimated measures and properties of questions concerned (Clinton, Jackman, and Rivers 2004). Another major approach using ideal point methods is to depend on "NOMINATE" score algorithms (Poole and Rosenthal 1985), which estimate ideal points using approximate Maximum Likelihood Estimation (MLE). Despite its wide popularity in its use in political science, some limitations discussed in more detail in Clinton and Jackman (2009) guide this study to use a Bayesian models.

In the Bayesian IRT model, I conceptualize "flexibility" as a latent characteristic of a treaty in a one-dimensional policy space ranging from highly flexible at one end to entirely rigid at the other. I assume that when countries enter into PTAs, the likelihood of including escape clauses increases when they have domestic distributional concerns. From the DESTA dataset, I select variables related to escape clauses, including antidumping, safeguards, and subsidies. A total of 27 variables are selected, and some are recoded to fit the purpose of measuring flexibility. A list of selected variables is in the appendix.

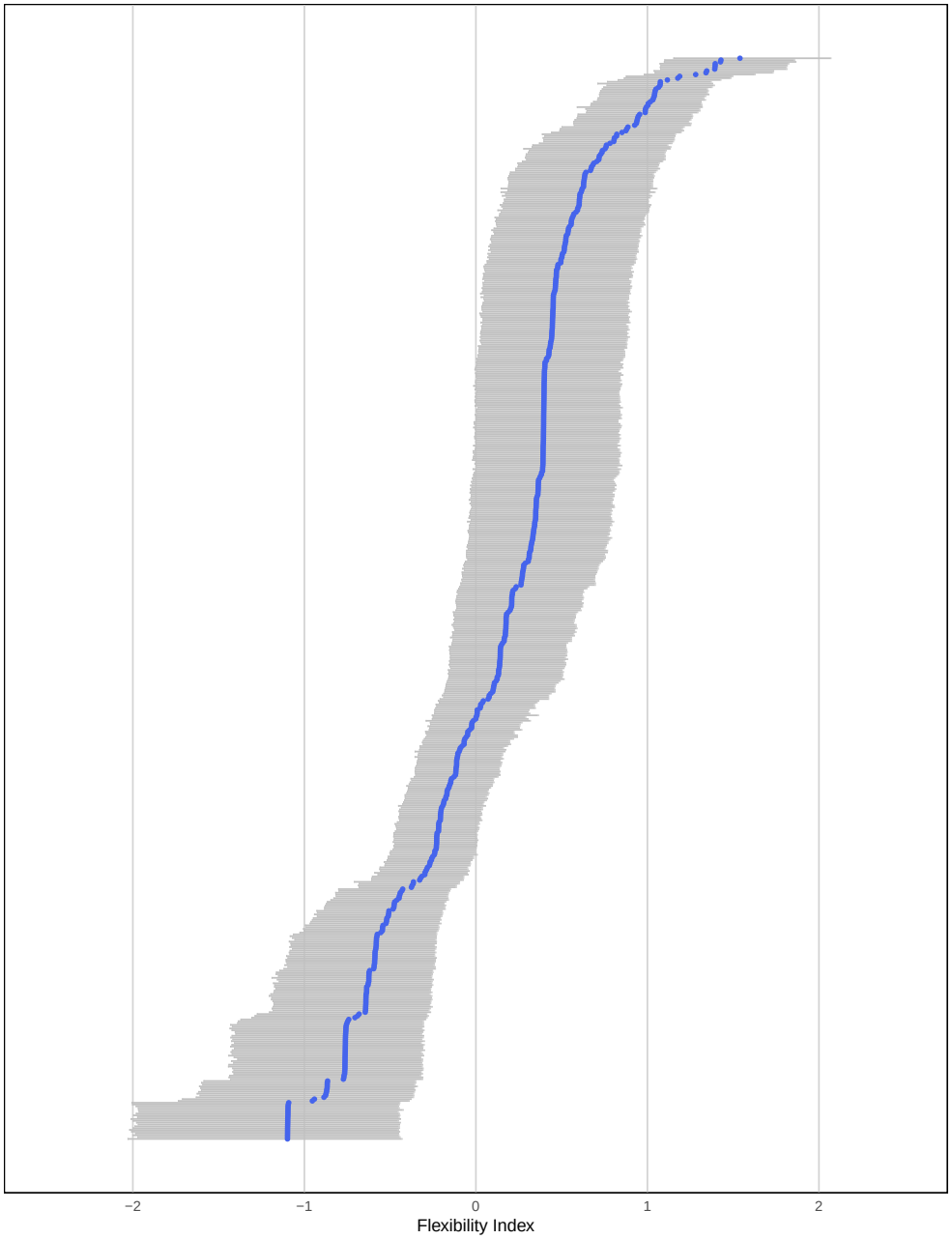
In the model, $y_{j,k} \in \{0, 1\}$ denotes an indicator variable equal to 1 if a trade agreement $j = 1, ..., n$ includes a trade flexibility clause $k = 0, ..., m$, and equal to 0 otherwise. The model parameter includes a latent trait θ_j and item parameters such as difficulty α_k and discrimination β_k. We then estimate the following model

$$Pr(y_{j,k} = 1|\theta_j, \alpha_k, \beta_k) = logit^{-1}(exp(\beta_k)(\theta_j - \alpha_k + \gamma)) \tag{1}$$

where the link function is assumed to be a logit-parameterized Bernoulli distribution. The difficulty parameter, α_k, indicates the degree to which countries report a clause k on average. The discrimination parameter, β_k, is equivalent to item specific slope for the logistic function and indicates how well including a escape clause k predicts including other clauses. I also include an intercept term γ, which represents the average agreement's inclusion of an average clause. The γ is used as the location parameter in the distribution of agreement's flexibility. Detailed discussions on the selection of priors, convergence diagnostics, and additional parameters are in the appendix.

Figure 3 provides a plot of the estimated flexibility measure. The measure is close to 1 for more

flexible PTAs and 0 for less flexible ones. The result shows that a treaty agreed between Finland and German Democratic Republic on 4 March 1975 is estimated to be the least flexible treaty among the list of PTAs in the DESTA dataset. The agreement was signed in Helsinki with the purpose of removing trade barriers between the two countries, but only identified some principles towards free trade without specifically establishing plans. On the contrary, the most flexible agreement is the Ukraine-EU Association Agreement signed in 2014. This agreement established a comprehensive political and economic relationship between the two parties. Concerning trade issues, they agreed to establish a free trade area known as the Deep and Comprehensive Free Trade Area (DCFTA) and eliminate custom duties on originating goods. Because of this landmark agreement, it was expected that Ukraine's largest trade partner would change from Russia to the EU. In the next section I test the main hypothesis of how domestic agricultural support affects the design of PTAs to be more flexible using this estimated measure of PTA flexibility.



Note: Blue points represent the mean of the posterior distribution. Grey lines represent 95% highest probability density intervals.

Figure 3: Estimated Measure of Treaty Flexibility

4 Empirical Analysis

4.1 Data and Variables

To test the main hypothesis, I use a hierarchical Bayesian IRT model, where estimated ideal points are the basis for a higher level (Gelman and Hill 2006). This estimated treaty flexibility is used as a main dependent variable to test the hypothesis that domestic supports for agriculture increase a level of flexibility of PTAs.

The key independent variable is the Producer Support Estimate (PSE) collected by the OECD. These agricultural support data cover 51 countries from 1986 to 2017. Compared to previous work on agricultural support, this cross-nationally comparable measure covers more countries and time periods (Sarker, Meilke, and Hoy 1993; Beghin and Kherallah 1994; Olper 2001). Agricultural support is defined as the annual monetary value of total transfers to farmers from consumers and taxpayers arising from government policies.[14] More specifically, the PSE comprises market price support, budgetary payments and the cost of revenue foregone. For the purpose of this study, I divide the PSE by employment in the agricultural sector,[15] because this per capita measure better captures actual government support for agriculture and to what extent individual farmers receive subsidies. Along with the PSE, I use another measure of agricultural support: General Services Support Estimate (GSSE). Similar to the PSE, the GSSE also measures government support for agricultural sectors, but only focuses on agriculture-related services. The GSSE includes support for development of private and public services, institutions and infrastructures, but it is different from the PSE in that it does not include any payments to individual producers. I also divide this measure by total employment in agriculture and use it as one of the main independent variables.

I include several sets of control variables that allow me to deal with possible confounding factors. These factors are grouped into macroeconomic conditions, levels of democracies, and organizational memberships.

First, I include four macroeconomic features of countries that potentially influence the design of trade treaties. I include the level of income, measured by the log of GDP per capita, which

14. Source: Producer and Consumer Support Estimates, OECD Database 1986-2017 at https://data.oecd.org/agrpolicy/agricultural-support.htm#indicator-chart

15. The data on agricultural employment is collected from the ILOSTAT Database of the International Labour Organization.

could possibly affect the flexible design of PTAs. To the extent that wealthier countries are better insulated against global economic shocks, these countries may be expected to prefer more rigid treaties (Kucik 2012). However, as these wealthier countries are also more likely to listen to the demands of domestic political constituencies, they may prefer to have more flexible defensive mechanisms. Thus, I am agnostic about the expected effects of this variable. The volume of trade is also expected to affect the level of treaty flexibility. All other things being equal, more trade may mean that countries prefer to design more flexible agreements because deeper concessions come with more trade defensive mechanisms. It is the conventional wisdom that there is a positive relationship between depth and flexibility (Downs, Rocke, and Barsoom 1996; Rosendorff and Milner 2001; Baccini, Dür, and Elsig 2015; Bearce, Eldredge, and Jolliff 2016). Countries are willing to make more concessions when there is "international insurance" that can be used in unexpected situations (Koremenos 2005). Next, I include the total population variable that could possibly affect defensive mechanisms of trade agreements. I expect that countries with large population are more likely to prefer flexible design of treaties because they need to care more about various interests of domestic constituencies. Finally, I include countries' overall tariff rate as a measure of protectionist barriers. It seems reasonable to assume that countries with higher levels of tariffs are reluctant to commit to free trade. Accordingly, these countries would prefer to have more flexible PTAs to use escape clauses as a means of protection. I thus expect that higher tariffs are positively related to more flexibility. These four macroeconomic variables are collected from the World Bank WDI.[16]

Second, I include two political institution variables that may affect the relationship between rural bias and treaty flexibility. To measure the degree of democracy, I use the polity2 score from the Polity IV project (Marshall and Jaggers 2012) to control for variations within democracies. As noted by Mansfield, Milner, and Rosendorff (2000), democratic countries are more likely to engage in free trade and enter into trade agreements. I thus expect that advanced democracies are more likely to prefer less flexible treaties. Among the democracies, political leaders in newly democratized countries are prone to be more commitments to international agreements for domestic economic reforms or international reputations (Baccini and Urpelainen 2014; Kono 2007). Thus democracies in transition are expected to make less flexible agreements. I include a dummy variable coded 1

16. GDP and GDP per capita are measured in current international dollars using purchasing power parity rates. Import and export data are measured current U.S. dollars. For levels of tariff rate, I use the most favored nation tariff rate calculated by the unweighted average of most favored nation rates for all products subject to tariffs.

if a country has introduced competitive elections within the last five years before PTA formation, and 0 otherwise.

Finally, to account for relative market power among members of PTA, I create a measure of relative share of GDP by dividing each country's GDP by the total GDP of other PTA members. This measure can be used as a proxy for a bargaining power among the members of PTAs. I also include the number of previous PTAs for each country. I expect that there is path dependence to PTA formation. As countries have more PTAs, it is more likely for them to modify previous PTAs (Koremenos, Lipson, and Snidal 2001). In this regard, it is more likely for a country to include escape clauses when they already have those clauses in their previous PTAs. Next, I include another forum effect by considering membership in the WTO. The WTO has well-defined escape clauses and dispute settlement mechanisms. Thus, if countries are WTO members, they can invoke WTO regulations more easily, which makes flexibility clauses in PTAs unnecessary. Accordingly, I expect that if countries are WTO members, it is less likely for them to include flexibility provisions in PTAs. I construct a dummy variable coded 1 if a country is a member of the WTO in a certain year, and 0 otherwise.

Some models include indicator variables for the regions to which countries belong, and all models include country fixed effects to control for unobserved factors that might affect PTA flexibility that are specific to fixed country characteristics. Some models include year fixed effects to control for factors inherent to a certain year that affects all countries globally. Descriptive statistics for all variables I use are in the appendix.

4.2 Results

Table 1 presents the estimated coefficients from a series of regression analyses. In model (1) – (3), the independent variable I use is the PSE and in model (4) – (6), I use the GSSE. Overall, positive coefficients of the two agricultural support measures at the conventional levels are identified in all model specifications. Because I use a fixed-effects estimator, these results can be interpreted as within-country changes over time. This indicates that increases in support for the agricultural sector are associated with increases in PTA flexibility. These results are consistent with the hypothesis that the political importance of agriculture measured in terms of government subsidies influences

Table 1: The Effects of Agricultural Support on PTA Flexibility

	Dependent Variable: Treaty Flexibility measure					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Producer Support (PSE)	0.010**	0.012**	0.007***			
	(0.005)	(0.005)	(0.002)			
Service Support (GSSE)				0.002**	0.002**	0.001***
				(0.001)	(0.001)	(0.000)
GDP per capita	1.517***	1.233***	0.164	1.521***	1.226***	0.106
	(0.334)	(0.311)	(0.128)	(0.336)	(0.313)	(0.123)
Trade volume	-0.414***	-0.230**	-0.261***	-0.439***	-0.245**	-0.242***
	(0.121)	(0.108)	(0.072)	(0.126)	(0.113)	(0.068)
Population	0.853	0.807	-0.466	0.905	0.808	-0.587*
	(0.697)	(0.637)	(0.321)	(0.701)	(0.648)	(0.341)
MFN Tariff	0.060**	0.067**	0.028	0.054**	0.061**	0.030
	(0.027)	(0.026)	(0.020)	(0.026)	(0.026)	(0.019)
Polity	-0.081**	-0.073*	-0.004	-0.076**	-0.071*	-0.002
	(0.038)	(0.039)	(0.022)	(0.037)	(0.038)	(0.022)
Democratization	-0.053	-0.013	0.096	-0.130	-0.050	0.150*
	(0.108)	(0.091)	(0.083)	(0.079)	(0.075)	(0.081)
GDP share	-0.001	0.001	0.001	-0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	0.015**	0.012*	-0.001	0.015**	0.012*	-0.001
	(0.006)	(0.006)	(0.003)	(0.006)	(0.006)	(0.003)
WTO membership	-0.420***	-0.510***	0.059	-0.393***	-0.485***	0.061
	(0.079)	(0.091)	(0.043)	(0.080)	(0.093)	(0.045)
Americas		-0.101	-0.174		-0.113	-0.158
		(0.138)	(0.191)		(0.144)	(0.191)
Asia		-0.061	0.036		-0.062	0.037
		(0.096)	(0.111)		(0.097)	(0.111)
Europe		-0.325***	-0.237***		-0.326***	-0.241***
		(0.021)	(0.018)		(0.021)	(0.021)
Oceania		-1.426***	-0.670*		-1.329***	-0.726**
		(0.415)	(0.335)		(0.418)	(0.307)
Intercept	-17.800	-18.795	12.786**	-18.083	-18.347	14.814**
	(12.271)	(11.252)	(6.120)	(12.342)	(11.420)	(6.516)
Country FE	✓	✓	✓	✓	✓	✓
Year FE			✓			✓
Observations	1,152	1,152	1,152	1,097	1,097	1,097
R-squared	0.016	0.016	0.201	0.011	0.014	0.172

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**} p < 0.05,^{*} p < 0.1$.

the likelihood of including higher level of flexibility in PTAs. To interpret the substantive meaning of the coefficient of agricultural support, I calculate the marginal effects in Model (3). When all other variables are held at their means, one standard deviation increase in the PSE from its mean will increase the probability of including flexibility provisions by 0.05.

The other findings mostly support our conjectures and previous literature. They additionally provide greater confidence in our models. Countries with higher GDP per capita increase the level

of flexibility. This indicates that rich countries are more likely to focus on demand from domestic constituencies. The trade volume is significantly associated with less flexibility PTAs, which is not consistent with the expectation because the trade volume does not accurately predict the depth of PTA concessions. Although countries trade more with others, this does not necessarily mean that they are more likely to commit to high levels of liberalization when having trade agreements. Population does not have consistent significant effects. MFN tariffs are also related to more flexibility, as expected. This means that countries with higher levels of tariffs are reluctant to commit to free trade, so that they prefer more flexible design of PTAs to be used as trade defensive mechanisms in the future. Among the two democracy variables, I could only find one significant effect from the level of democracy on PTA flexibility. It shows that countries with advanced democracies are less likely to include flexibility provisions, which can be seen as more commitment to free trade. In the case of PTA, countries in the transition towards democracy do not have any effect on treaty flexibility. Moreover, the pattern is consistent with path dependency in PTA formations: it appears that when countries enter in trade agreements, they are likely to refer to previous PTAs in designing flexibility mechanisms. As countries have more trade agreements, they are more likely to include flexibility clauses in PTAs. Finally, WTO membership also has a negative effect on PTA flexibility, as expected. Members of the WTO who seek to have regional trade agreements prefer to use well-established escape clauses of the WTO, so they have less incentive to include flexibility provisions in PTAs.

4.3 Instrumental Variable Approach

The results demonstrate that domestic agricultural protection is strongly associated with more flexible design of PTAs. Yet, the model may suffer from some other form of endogeneity for which I have failed to introduce a control. In this section, I present a strategy to address this concern.

As discussed in previous sections, malapportioned electoral district can be regarded as the basis for rural bias in democracies. The discrepancy between the share of legislative seats and the share of voters held by geographical units causes normative concerns, as well as public-policy bias. I use malapportionment as an instrumental variable for agricultural subsidies. Assuming that malapportioned electoral districts do not influence the design of PTAs other than through an effect on the agricultural support in democracies, the use of an instrumental variable approach should

address concerns that the main results of the previous section are driven by an endogenous variable.

To construct an instrumental variable for rural bias using malapportionment, I use data from Samuels and Snyder (2001) that provides the number of the population of the electoral district and the number of legislative seats in the electoral districts for 78 countries in the world. They also provide a formula to create a comparable index, MAL, which is given by:

$$MAL = \frac{1}{2}\Sigma|s_i - v_i| \tag{2}$$

where s_i is the percentage of all seats allocated to district i, and v_i is the percentage of the overall population (or registered voters) residing in district i.[17]

For the instrument to meet the assumption of exclusion restriction, malapportionment affects the design of trade agreements primarily through agricultural supports. One might raise the possibility that malapportionment directly influences flexibility of PTAs. However, this is unlikely because in most countries electoral districts were established long before making trade agreements. Malapportionment was determined in the constitutional era in most countries and the constitutional decisions are distant historical events. It is thus reasonable to believe that this instrument is valid.

Table 2 reports the results of the two-stage estimation of the flexibility of PTAs, instrumenting for agricultural subsidies using malapportionment index. In Model 1 and Model 2, I instrument for the PSE, and in Model 3 and Model 4, the GSSE is instrumented. In continued support of my theory, the effects of agricultural producer support measured by the PSE are still positive and statistically significant at the 1% level. In Model 3 and Model 4, I also instrument for agricultural bias measured by the agricultural service support, the GSSE, using the same malapportionment index and have a same result. The higher level of agricultural service support is more likely to make regional trade agreements more flexible.

Regarding other control variables, the standard macroeconomic controls are not much changed from the noninstrumental approaches. The volume of trade is negatively associated with the PTA

17. Samuels and Snyder (2001) provide malapportionment data for lower and upper chambers separately. To construct an overall index, I take an average value of the lower and upper chambers only if the upper chamber has an authority over public policy (Tsebelis and Money 1997). If there is no upper chamber or the upper chamber is not effective, then I only use the index of the lower chamber.

Table 2: IV Regression Results

	DV: Treaty Flexibility measure			
	Model 1	Model 2	Model 3	Model 4
Producer Support (PSE)	0.350***	0.319***		
	(0.127)	(0.111)		
Service Support (GSSE)			0.182**	0.148***
			(0.076)	(0.057)
GDP per capita	0.284**	0.172	0.130	0.040
	(0.121)	(0.109)	(0.126)	(0.115)
Trade volume	-0.168***	-0.128**	-0.299***	-0.225**
	(0.062)	(0.056)	(0.114)	(0.091)
Population	0.200***	0.151***	0.403***	0.307**
	(0.066)	(0.058)	(0.153)	(0.121)
MFN Tariff	0.013	0.016	0.034*	0.033**
	(0.010)	(0.010)	(0.019)	(0.017)
Polity	0.006	0.027	0.076	0.077*
	(0.027)	(0.027)	(0.052)	(0.043)
Democratization	0.131	0.147*	0.142	0.175*
	(0.083)	(0.089)	(0.093)	(0.095)
GDP share	0.000	0.001	-0.002*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	0.001	0.002**	0.004**	0.004**
	(0.001)	(0.001)	(0.002)	(0.002)
WTO membership	-0.003	-0.033	-0.119	-0.113
	(0.060)	(0.057)	(0.089)	(0.072)
Americas		-0.275***		-0.331***
		(0.095)		(0.103)
Asia		-0.003		-0.127
		(0.073)		(0.108)
Europe		-0.239***		-0.224***
		(0.028)		(0.032)
Oceania		-0.725***		-0.722***
		(0.171)		(0.184)
Intercept	-0.877	-0.182	-0.232	0.420
	(0.785)	(0.683)	(0.729)	(0.647)
F statistics	205.9	169.9	47.2	61.8
Observations	928	928	873	873
R-squared	0.61	0.642	0.526	0.59

Notes: Table 2 reports 2SLS estimates. The malapportionment measure is the instrument for the PSE and the GSSE. Robust standard errors clustered by country in parenthesis. All specifications include year fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

flexibility. Also, a larger population and MFN tariffs are positively associated with flexible treaty designs, and its coefficient is statistically significant at the conventional levels. Other political variables such as the polity score and democratization are associated with more flexible PTAs. The path dependency effect measured by the number of previous PTAs is also continuously positive and statistically significant. Finally, among several indicators of region, countries in the America, Europe and Oceania are less likely to prefer flexible treaties. The coefficients of the PSE and GSSE are greater than those in Table 1, which improve the efficiency of estimates. Additionally, the Wald

F statistic from the excluded instruments suggests that the first stage does not suffer from a weak instrument problem.

In this section I dealt with a potential concern that the positive relationship between agricultural subsidies and the flexible design of PTAs is driven by the endogeneity bias. By introducing the malapportionment index as an instrument for agricultural subsidies, I demonstrated that the positive relationship between malapportionment and flexibility does not disappear; in fact, it becomes much stronger. With these results, I reconfirm a powerful effect of agricultural bias in democracies on the flexible design of regional trade agreements.

I further test the robustness of the findings in mainly two types of sensitivity: variables selection and sample selection. First, I examine whether the results are sensitive to other control variables. I include more control variables and other time-specific fixed effects in the main regression analysis. Also, I use different independent variables to capture the share of agricultural sector such as the share of rural labor, the share of rural population, and the land-labor ratio. I find similar results based on using these different control variables, time fixed effects, and different independent variables. Second, I estimate the main regression using different samples to deal with concerns that the results are driven by biased samples. Excluding extensions and amendment of previous PTAs, I rerun the models using only base treaties. And then I replace the EU with Germany or France to deal with the possibilities that the results are driven by inflation of observations in the members of the EU. I still find that agricultural subsidies have a positive and strong effect on the flexibility of PTAs, suggesting that the results are not driven by sample selections. I present detailed discussions and empirical results of these additional analyses in the appendix.

In the next section, I further explore the relationship between agricultural support and PTA flexibility at the agricultural-product level. This approach helps us understand better which agricultural products are considered more protected than others.

4.4 Commodity-Level Analysis

The evidence I have presented so far demonstrates that agricultural subsidies in democracies help explain the level of flexible design of trade agreements because governments cater their trade policy choices to groups in society that have greater electoral influences. Though the evidence supports this study's argument, it only tests the aggregate amount of agricultural supports. Given that the

amount of agricultural subsidies is different in each commodity, further commodity-based analyses allow us to see to what extent some commodities are protected more than others.

Along with the aggregate agricultural support measured by the PSE, which covers all agricultural commodities produced in the country, the OECD database on Producer and Consumer Support Estimates provides individual amounts of subsidies for commodities that exceed 1% of the total value of production.[18] A total of 64 commodities is included in the database from 1986-2017.

Table 3 presents empirical results using several agricultural commodities such as wheat, soybeans, rice, poultry, and pork. Among these five commodities, the coefficients of wheat, soybeans and poultry are positive and significant at conventional levels. This means that as the level of agricultural supports for these commodities increases, the level of government protection is associated with more escape clauses when countries make trade agreements. The escape clauses permit countries to cope with any emergency that could potentially harm domestic agricultural industries. The coefficient of rice is positive but statistically not significant, and subsidies for pork show a negative coefficient that is not significant.

Wheat and poultry are among the most frequent sources of trade disputes at the WTO.[19] For example, Brazil raised a dispute against Argentina in 2001 regarding anti-dumping duties imposed by Argentina on imports of poultry from Brazil.[20] Alleging that imports of poultry from Brazil were taking place at dumped prices, which constituted a "threat of material injury" to the domestic poultry industry, Argentina justified its use of anti-dumping measures against Brazilian poultry products. After two years of legal procedures, the panel concluded that Argentina had not acted inconsistently with WTO regulations, meaning that Argentina's anti-dumping measures did not legally violate the WTO Agreement on Agriculture, and the case was concluded.

Nowadays soybean has becoming a major issue in trade protectionism. During the last decade, the world experienced a dramatic change in the world price of soybean.[21] The price surged from $256 per metric ton in 2007 to $552 per metric ton in 2008 and then plummeted to $380 per metric ton in 2009.[22] This high volatile price of soybean caused uncertainty and vulnerability for

18. Source: http://www.oecd.org/agriculture/agricultural-policies/producerandconsumersupportestimatesdatabase.htm
19. As of July 2018, wheat has been a target of trade disputes for 10 times and poultry for 9 times.
20. WTO panel report WT/DS241/6
21. For causes of the volatility of agricultural commodities, see Timmer (2008), Gilbert (2010), and Gilbert and Morgan (2010)
22. IMF Primary Commodity Statistic at http://www.imf.org/external/ np/res/commod/index.asp

Table 3: The Effects of Agricultural Support on PTA Flexibility

	Dependent Variable: Treaty Flexibility measure				
	Model 1	Model 2	Model 3	Model 4	Model 5
Wheat	0.013**				
	(0.005)				
Soybeans		0.051*			
		(0.029)			
Rice			0.028		
			(0.024)		
Poultry				0.090**	
				(0.040)	
Pork					-0.023
					(0.024)
GDP per capita	0.435	0.249*	0.211	0.095	0.133
	(0.280)	(0.133)	(0.152)	(0.155)	(0.263)
Trade volume	-0.053	-0.284***	-0.284***	-0.262***	-0.287**
	(0.442)	(0.079)	(0.091)	(0.089)	(0.133)
Population	-0.317	-0.179	-0.173	-0.663*	-0.110
	(1.194)	(0.323)	(0.335)	(0.359)	(0.456)
MFN Tariff	-0.014	0.056	0.019	0.016	0.005
	(0.014)	(0.037)	(0.032)	(0.018)	(0.024)
Polity	0.086	-0.019	-0.023	-0.019	-0.032
	(0.049)	(0.019)	(0.018)	(0.023)	(0.022)
Democratization	0.097	0.147*	0.158*	0.122	0.152
	(0.155)	(0.081)	(0.089)	(0.077)	(0.138)
GDP share	0.000	0.000	0.000	0.001	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	-0.002	-0.003	-0.003	-0.002	-0.013**
	(0.015)	(0.003)	(0.003)	(0.003)	(0.006)
WTO membership	-0.024	0.071*	0.078**	0.096**	0.110**
	(0.376)	(0.037)	(0.035)	(0.041)	(0.042)
Americas	-0.234	-0.235	-0.201	-0.212	-0.194
	(0.188)	(0.221)	(0.216)	(0.140)	(0.151)
Asia	0.021	0.072	0.073	0.034	-0.021
	(0.100)	(0.149)	(0.126)	(0.094)	(0.124)
Europe	-0.267***	-0.235***	-0.245***	-0.250***	-0.272***
	(0.072)	(0.020)	(0.020)	(0.019)	(0.018)
Oceania	0.015	-0.574	-0.341	-0.454	-0.037
	(0.218)	(0.560)	(0.528)	(0.306)	(0.446)
Intercept	2.358	6.939	7.858	16.458**	8.397
	(11.910)	(6.711)	(6.633)	(7.081)	(8.627)
Country FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Observations	235	990	1022	1194	876
R-squared	0.148	0.344	0.339	0.172	0.149

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

exporters. When the price of soybean dropped below the average level, governments intervene in domestic agricultural market and subsidies the farmers.

5 Conclusions

What explains the defensive mechanisms of PTAs in democracies? Existing literature has paid relatively little attention to the link between domestic agricultural sectors and protectionist mechanisms of regional trade agreements. Countries make liberalization commitments through PTAs because they want to reap the benefits of inexpensive imports while also having access to foreign markets. On the other hand, domestic political constituencies have diverse preferences over free trade because of distributional concerns. Democratic political leaders thus need to find ways to appease potential losers from free trade. In this article, I examine how domestic agricultural sectors affect the flexible design of PTAs given that in most cases agricultural sectors are the key electorates that affect policymaking in democracies. I argue that democratic political elites choose flexible treaty designs as a means to protect domestic agricultural sectors when they are more concerned about domestic farmers. As flexible treaty designs defined by escape clauses allow countries to shirk their contractual duties temporarily, political leaders can suspend liberalization commitments in trade and as a result, they can satisfy the domestic agricultural groups in the case of developments in unexpected events.

To validate the link between the agricultural support and the treaty flexibility, I create a measure of flexibility using a Bayesian IRT model and construct panel data using the DESTA covering PTAs contracted from 1948-2017. I find robust empirical support for my argument: political leaders are more likely to prefer flexible design of PTAs when they are more concerned about domestic farmers. To exclude the possibility that this relationship is driven by an endogeneity bias, I introduce an instrument for agricultural subsidies using exogenous variation in the malapportionment in electoral districts, where I continue to find a robust relationship between agricultural support and flexible design of regional trade agreements.

This study emphasizes the importance of understanding the impact of domestic political groups on the trade policies at the bilateral or regional levels. Existing studies on the determinants and consequences of PTA formation overlook this relationship. One of the most prominent phenomenon of trade liberalization in the last several decades is a switch of focus from multilateral negotiations to regional-level agreements, and agricultural issues have been always considered a stumbling block for trade liberalization. This study provides systematic analyses by combining the link between

agricultural issues, demand for protection from domestic political groups, and the design of regional trade agreements. Furthermore, this article can improve an understanding on the effects of domestic salient groups on the optimal design of trade agreements.

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Providing Protection: Agricultural Support and the Flexibility of Preferential Trade Agreements in Democracies

September 2018

Online Appendix

Contents

A Data

A.1 Summary Statistics

Statistic	N	Mean	SD	Min	Max
Flexibility	3795	0.01	0.66	-1.11	1.54
Rural employment	1413	798.96	1499.31	2.00	8904.00
logged Producer Support Estimate (PSE)	1514	11.02	1.16	0	12.40
logged General Service Support Estimate (GSSE)	1483	6.09	1.03	0.39	10.72
Polity2 score	3435	4.95	6.78	-10.00	10.00
logged GDP	2490	25.38	2.09	16.94	30.62
logged GDP per capita	2490	9.40	1.10	5.48	11.65
logged import	2840	23.58	2.33	16.01	28.49
logged export	2840	23.49	2.49	14.06	28.49
logged trade	2840	24.24	2.39	16.78	29.13
logged population	3700	15.73	1.96	8.92	21.04
Malapportionment	1531	0.07	0.06	0.01	0.23
MFN tarriffs	2033	8.18	4.45	0	45.56
WTO membership	3794	0.46	0.50	0	1
GDP share among PTAs	2490	19.52	28.96	0	100
Previous PTAs	3794	18.28	19.79	0	94
Democratization	3795	0.04	0.20	0	1
OECD	3795	0.38	0.48	0	1
EU	3795	0.31	0.46	0	1
Africa	3795	0.07	0.25	0	1
Americas	3795	0.15	0.36	0	1
Asia	3795	0.08	0.27	0	1
Europe	3795	0.27	0.45	0	1
Oceania	3795	0.01	0.08	0	1

Table 1: Descriptive Statistics

A.2 Correlation Matrix

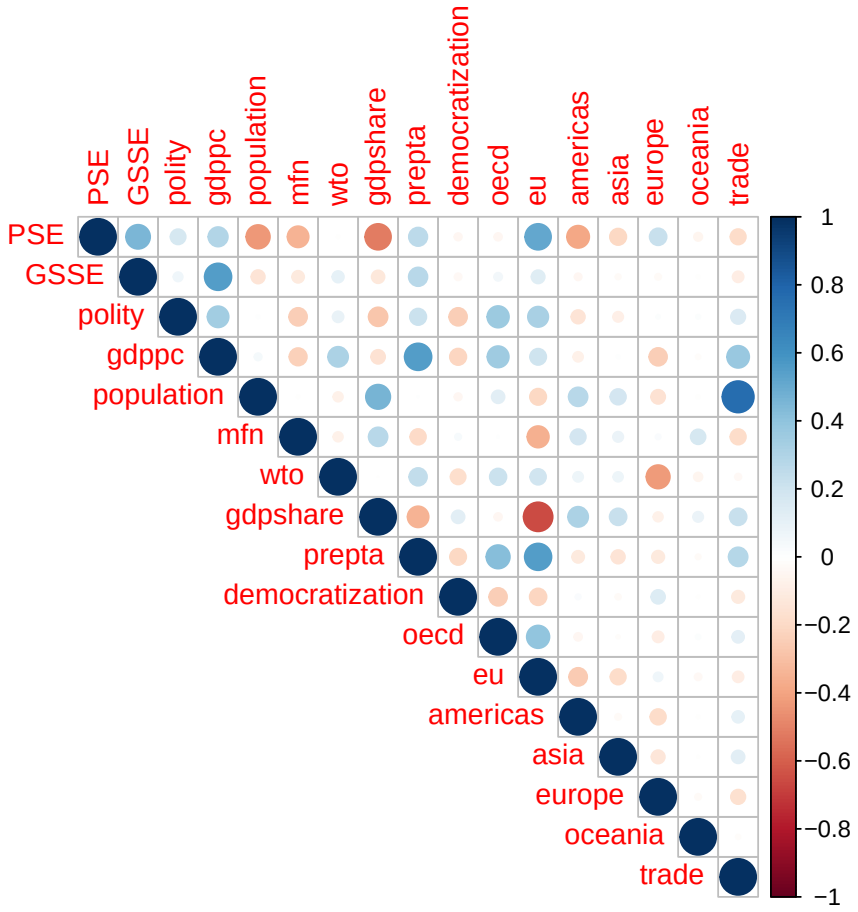

Figure 1: The Correlation Matrix Plot

B Bayesian IRT Models

B.1 Variable Selection

As of August 2018, the DESTA database provides coded data on market access, services, investment, public procurement, competition, technical barriers to trade, sanitary and phytosanitary measures, trade defensive instruments, dispute settlement, and non-trade issues. Among the categories of available data, I use trade defensive instruments database, which provides specific coding on anti-dumping, subsidies and countervailing duties, and safeguards. Using these variables, I create an index of treaty flexibility using Bayesian IRT models. Specific list of selected variables are as follows.

Variable	Content
Anti-dumping	
TR_AD_PROV	Is there an anti-dumping provision?
TR_AD_WTO	Is there a reference to GATT/WTO?
TR_AD_ALLOWED	Is it allowed to use AD measures?
TR_AD_OUTRULED	Is the use of AD explicitly outruled?
TR_ADMAS	Do parties search for mutually accepted solutions prior to investigation?
TR_ADDEMINIMIS	Do parties explicitly agree on a *de minimis* dumping margin (or dumped volume) that differs from the GATT/WTO?
TR_ADSUNSET	Do parties agree on a duration of AD duty that differs from GATT/WTO?
TR_ADLESSERDUTY	Do parties explicitly agree on a lesser duty rule?
TR_ADPUBLIC	Do parties agree on taking broader public interest in account (beyond s ector interests)?
TR_ADLEGAL	The PTA's dispute settlement does not apply to AD
TR_ADLEGALWTO	Parties agree that the resolution of a dispute can occur in the WTO
Subsidies and Countervailing Duties	
TR_SUB_PROV	Are there any subsidy provisions?
TR_SUB_GEN_REF	Is there a general reference to subsidies?
TR_SUB_WTO	Is there a reference to GATT/WTO?
TR_SUB_POLICY	Do parties develop a common policy on subsidies?
TR_SUB_ALLOWED	Is there an explicit reference to allowing subsidies?
TR_SUB_OUTRULED	Is there an explicit reference to outrule subsidies?
TR_COUNTERVAIL	Are countervailing duties mentioned in the agreement?
Safeguard	
TR_SAFE_PROV	Does the agreement contain specific safeguard provisions for PTA parties?
TR_SAFE_WTO	Does the agreement refer to GATT/WTO provisions on safeguards?
TR_SAFE_OUTRULED	Does the agreement outrule the use of safeguards?
TR_SAFE_GLOBEXCL	Do PTA members agree on conditions under which partners will be excluded from multilateral safeguard measures?
TR_SAFE_TRANS	Parties allow safeguard measures only during a transition period?
TR_SAFE_CEILING	Parties allow safeguard measures on products up to the MFN duty or the temporal suspension of a duty reduction
TR_SAFE_DUR	Parties agree on a duration (and extension) of safeguard duty that is different from GATT/WTO
TR_STRUCT_ADJUST	Is there a reference to a structural adjustment?
TR_BOP	Is there a reference to a balance of payment adjustment?

Table 2: Selected Variables from the Design of Trade Agreements (DESTA) Database for the Construction of Latent Trait of PTAs

B.2 Details on the Model

While existing literature uses a Markov Chain Monte Carlo algorithm with Just Another Gibbs Sampler (JAGS) for estimating IRT models (Hollyer, Rosendorff, and Vreeland 2014), this study uses the No-U-Turn Sampler (NUTS), an extension to Hamiltonian Monte Carlo (HMC) algorithm (Hoffman and Gelman 2014). NUTS uses a recursive algorithm to build a set of likely candidate points that spans a wide range of the target distribution and it automatically stops when starting to double back and retrace its steps. More importantly, NUTS performs more efficiently than other methods with significantly less amount of time. In addition, it estimates models from highly correlated data and works well with IRT models (Hoffman and Gelman 2014).

This study estimates the IRT model with Stan. This program language is based on C++ and specifically focuses on estimating Bayesian statistical models. The Bayesian IRT model in this study is estimated using four chains of 20,000 iterations each, and the first 5,000 of those iterations are discarded as a burn-in period. To deal with possible autocorrelation in the sampling procedures, I only select every 10th samples. If the drawn chains are strongly autocorrelated, they produce clumpy samples that are not representative of the posterior distributions. After running the models, I use Gelman-Rubin diagnostics statistics to assess the convergence with the threshold of 1.03 (Gelman, Rubin, et al. 1992; Gelman et al. 2014).

I use less informative half-Cauchy prior $\sigma \sim Cauchy(0, 0.25)$ for the two characteristic parameters, *difficulty* and *discrimination*. This half-Cauchy priors are more appropriate for hierarchical models (Gelman et al. 2006; Polson, Scott, et al. 2012). To estimate the latent flexibility, I use more restrictive prior, $\theta \sim Normal(0, 1)$, to keep the measure within the boundary of a unit interval.

B.3 Model Diagnostics

Among many diagnostic checks for Markov Chain Monte Carlo methods (Gill 2008), I report Gelman-Rubin convergence diagnostics here (Gelman et al. 2014). Figure 2 shows that most of the statistics are below 1.002. This is below the desired threshold, 1.03, and none of the estimated parameters have a value over this threshold. Therefore, these results show no sign of non-convergence for this model.

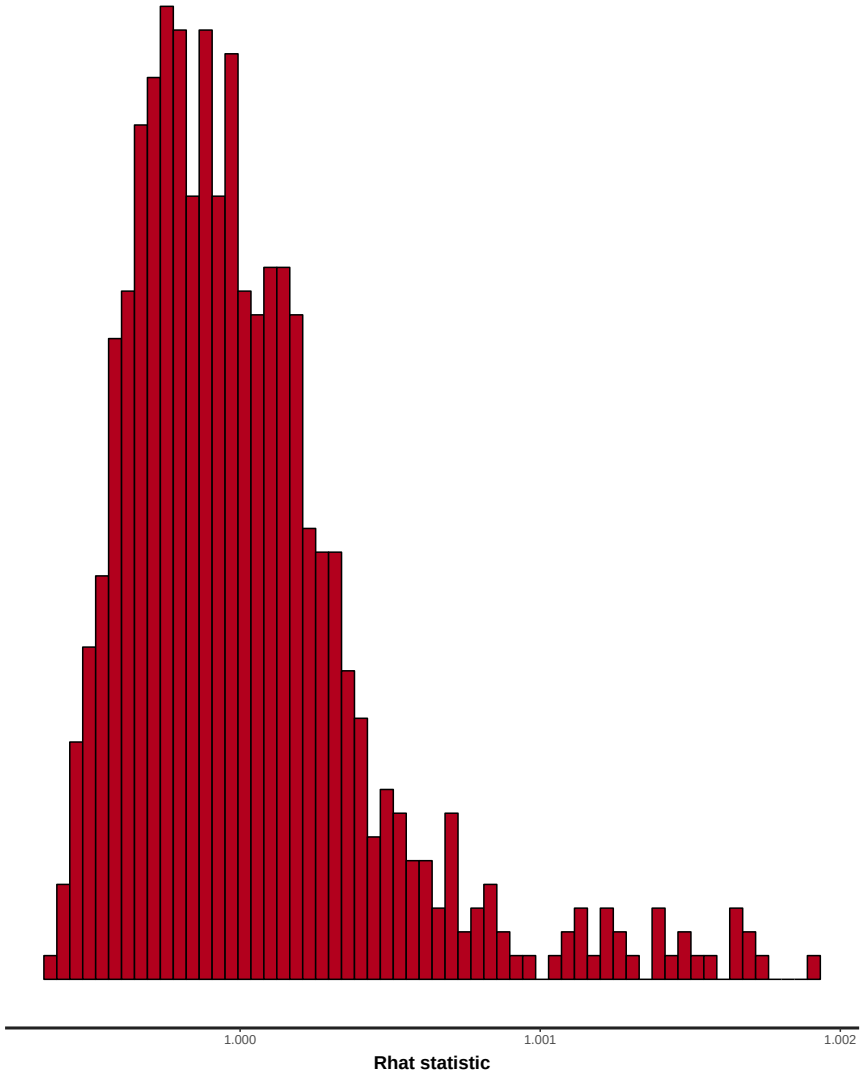

Figure 2: Gelman-Rubin Statistics for the PTA Flexibility

B.4 Item Characteristics Parameters

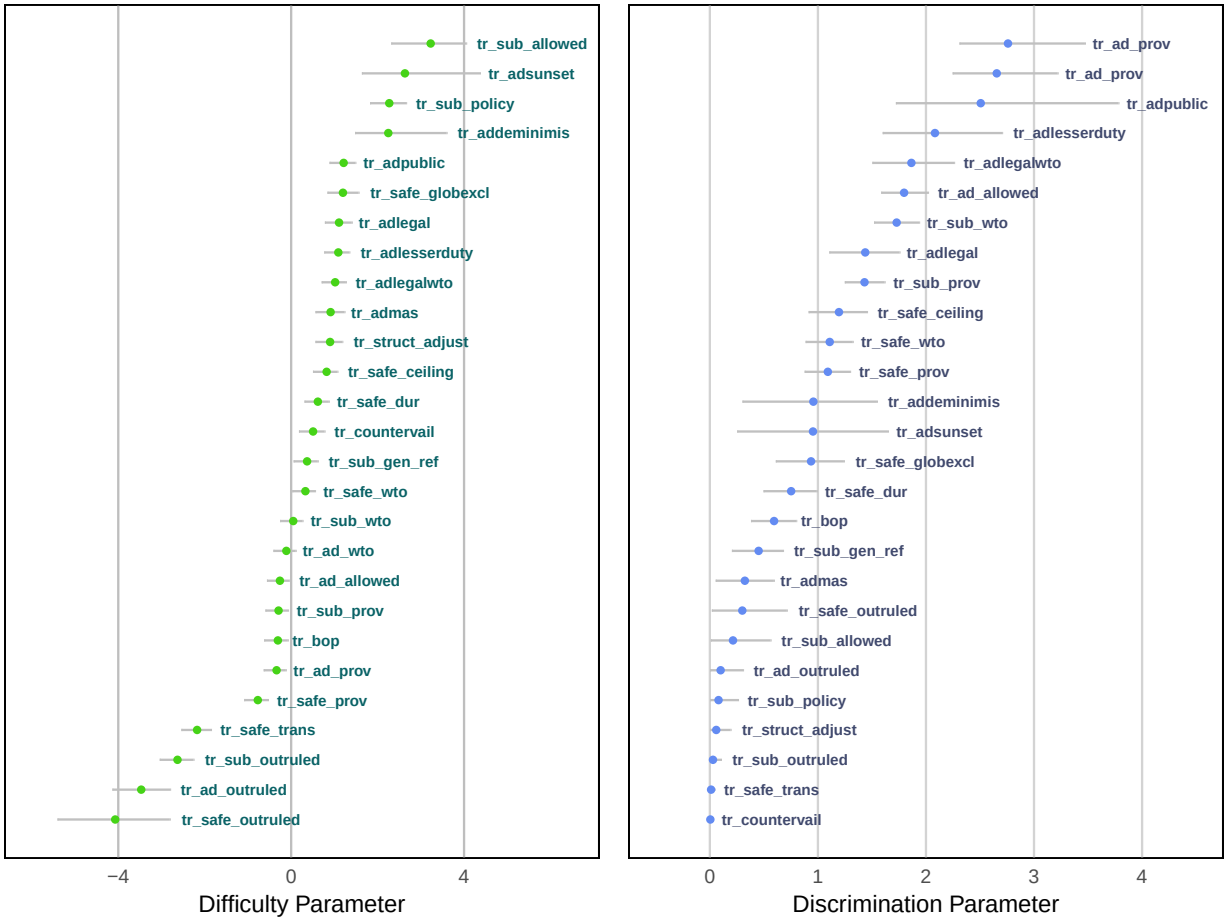

Figure 3: Item Characteristics Parameters

Although the latent trait of flexibility is of primary interest in this study, the characteristics parameters also provide qualitative knowledge about the provisions contained in PTAs. In this section, I discuss the two item characteristics parameters: *discrimination* and *difficulty* parameters (Johnson and Albert 2006). The discrimination parameter of the kth item, $\beta_j \in \mathbb{R}$, shows how the probability of including a certain provision responds to changes in the latent trait θ. In the item response curve, the probability of including flexibility provisions is an increasing function of the latent trait θ. The item response curve is in most cases a monotonically increasing function because increased flexibility leads to a greater likelihood of including more flexibility provisions. The discrimination parameter controls the slope of the item response curve and indicates how well a particular item discriminates between PTAs with various levels of flexibility. The discrimination

parameter is constrained to have only positive values because negative discrimination is undesirable and unlikely (Johnson and Albert 2006). I report the estimated discrimination parameters for each item in the left panel in Figure 3. As shown in Figure 3, a provision, 'Is there an anti-dumping provision? (TR_AD_PROV)' has the highest value of the discrimination parameter, meaning that including this provision is much more indicative of how likely a country is to include other flexibility provisions.

The difficulty parameter, $\alpha_k \in \mathbb{R}$ indicates the probability of including a clause regardless of changes along the scale of the ideal point θ. This difficulty parameter controls the location of the item response curve or the difficulty of an item. The estimated difficulty parameters are reported in the right panel in Figure 3. A provision, 'Is there an explicit reference to allowing subsidies? (TR_SUB_ALLOWED)' has the highest value of the difficulty parameter, whereas 'Does the agreement outrule the use of safeguards? (TR_SAFE_OUTRULED)' has the lowest value.

B.5 More IRT Graphs

In this section, I provide more IRT plots for PTAs concluded in the different continent. By separating PTAs based on the continent, I can present specific information about each PTA. Figure 4 plots the estimated flexibility index of African countries. Figure 5 plots PTAs in Oceania countries and Figure 6 plots countries in the North and Latin American countries. Figure 7 concerns PTAs contracted among Asian countries. Figure 8 is estimated flexibility among European countries. Finally, Figure 9 provides estimated plots for countries in different continents.

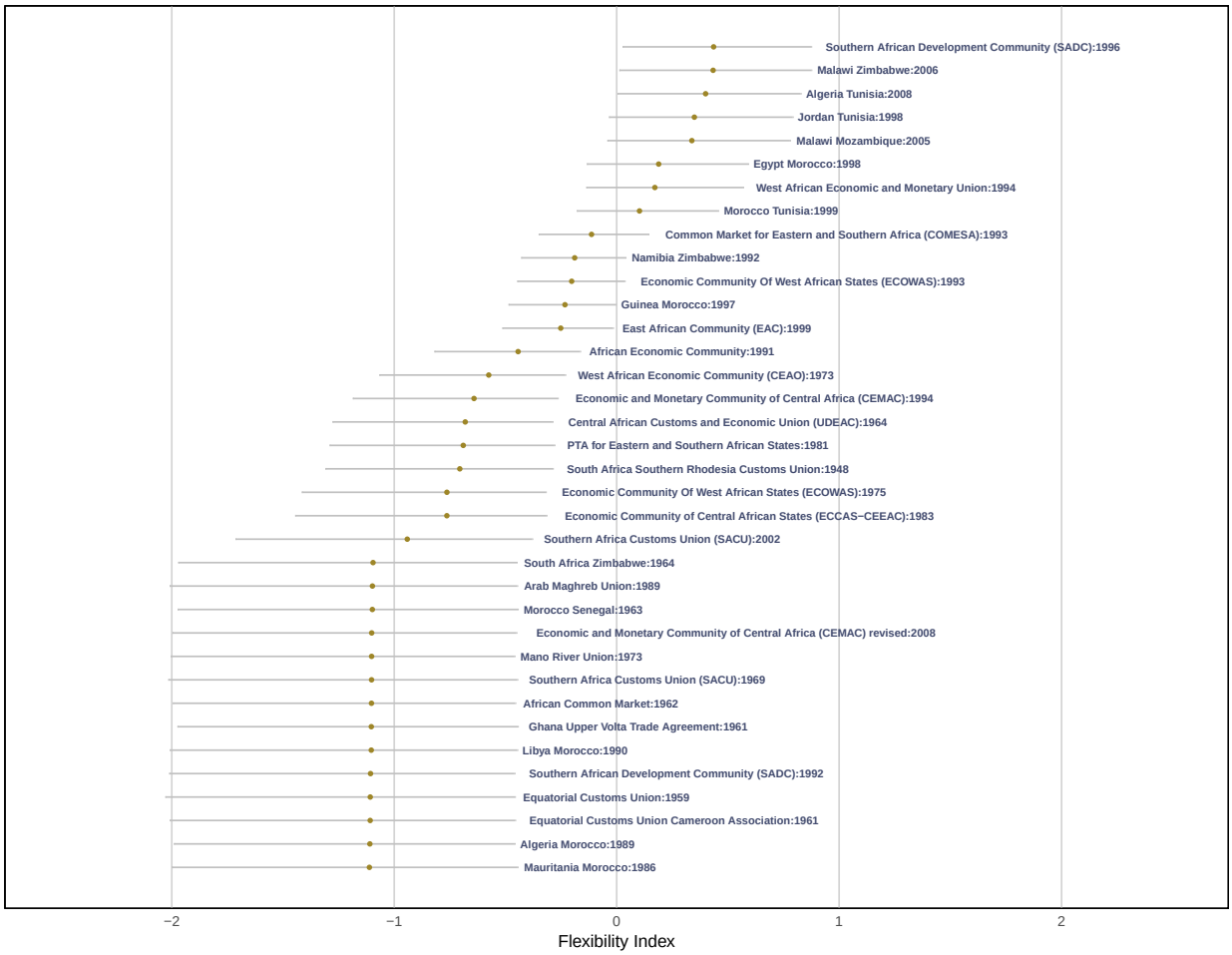

Figure 4: PTA Flexibility in African Countries

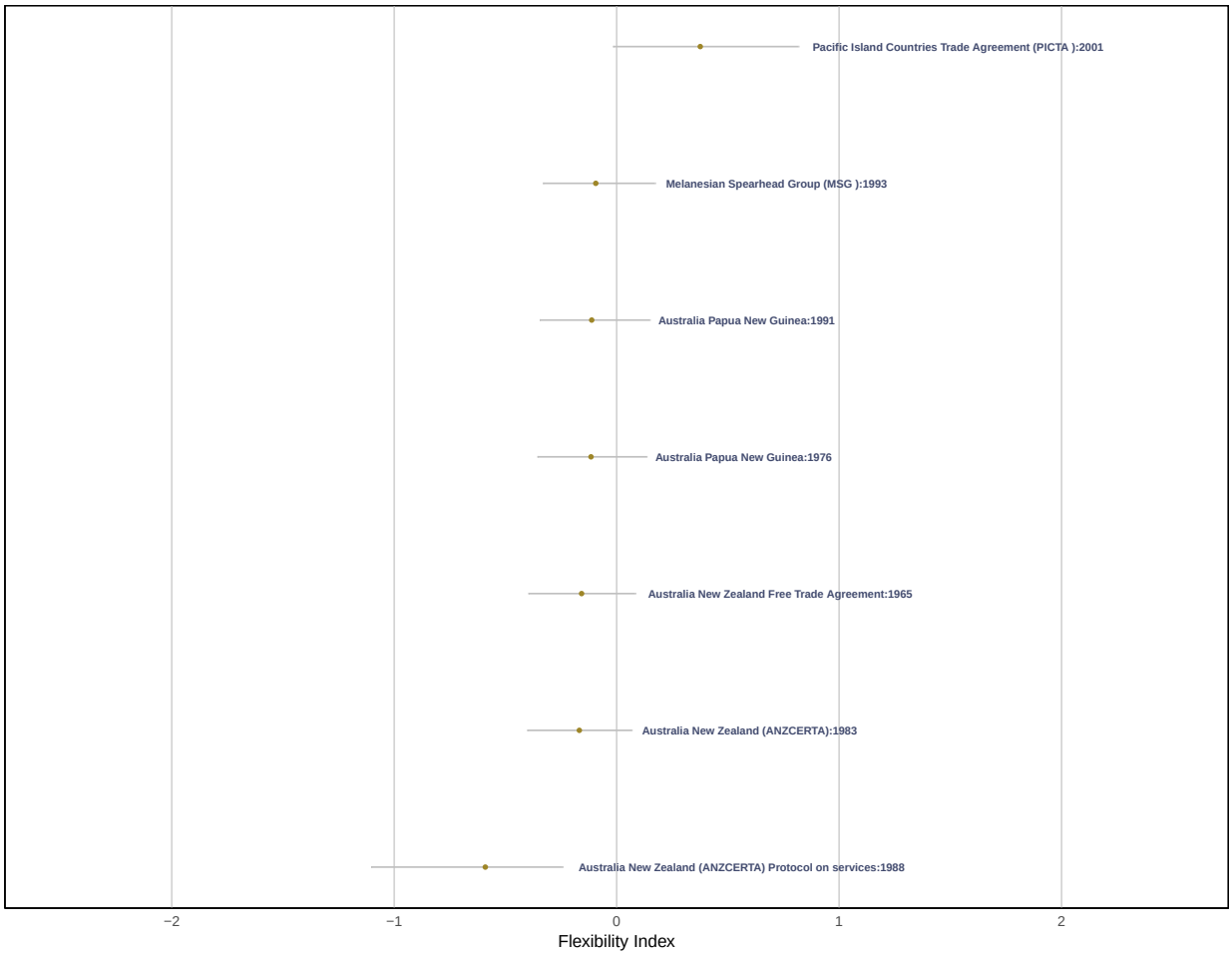

Figure 5: PTA Flexibility in Oceania Countries

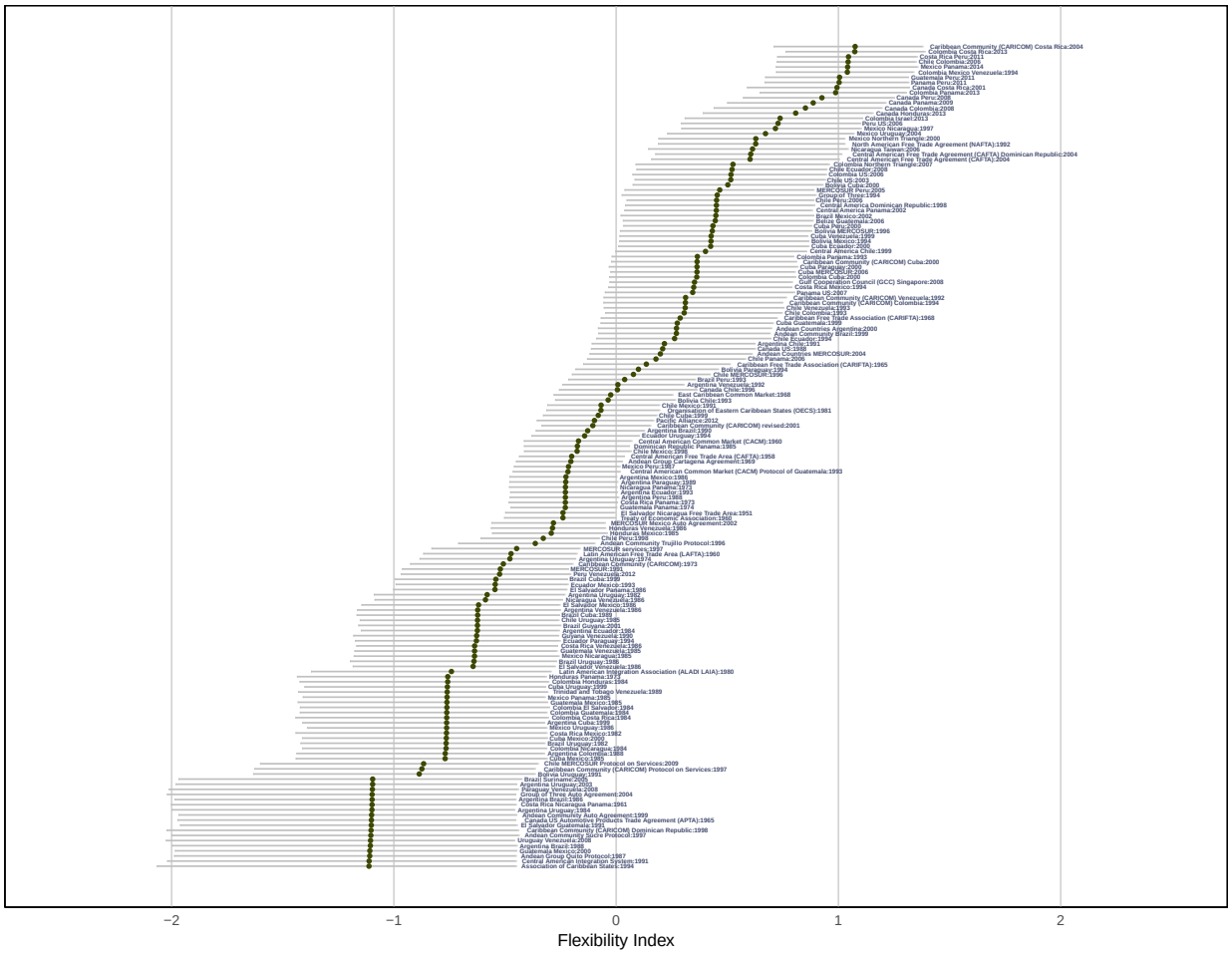

Figure 6: PTA Flexibility in American Countries

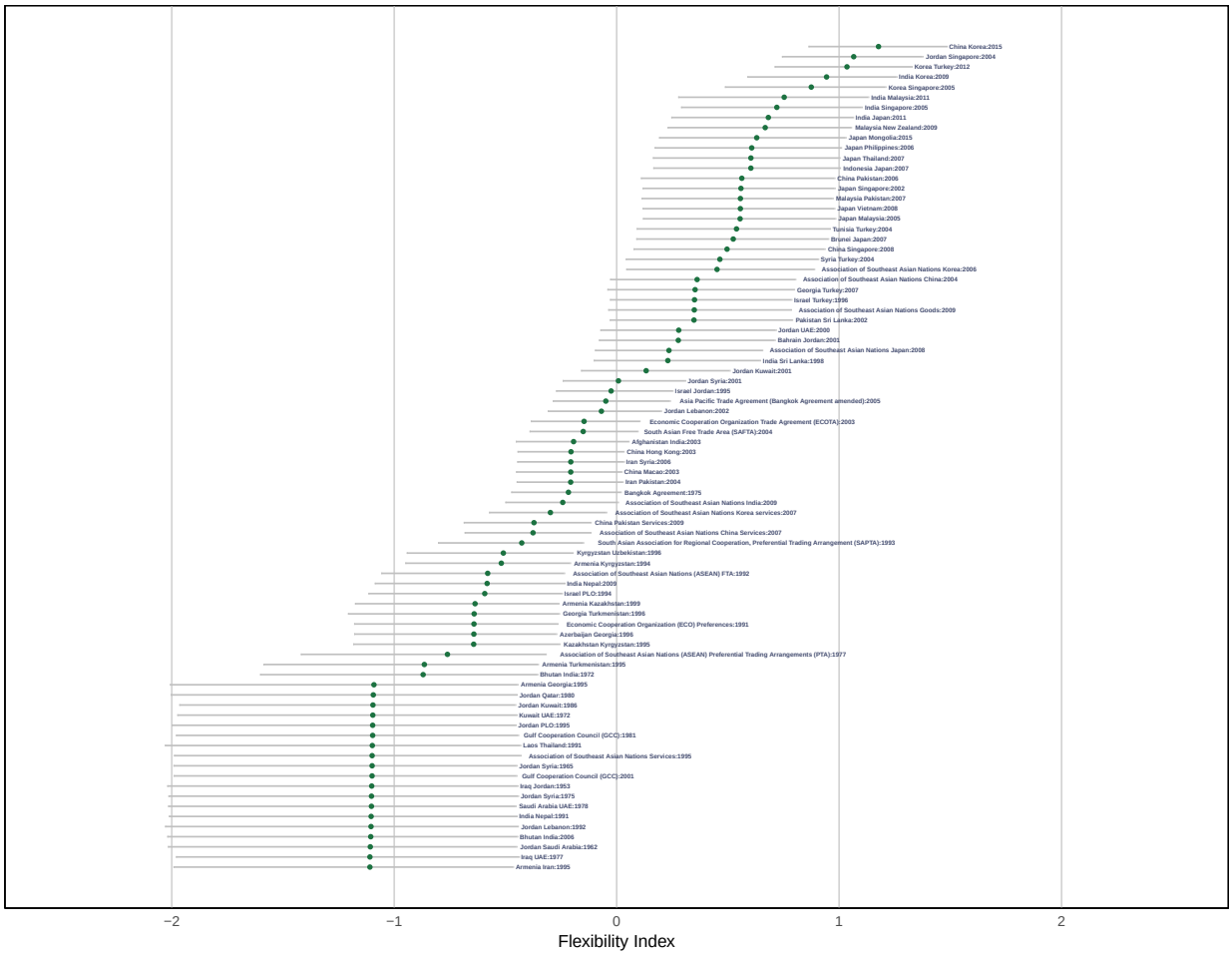

Figure 7: PTA Flexibility in Asian Countries

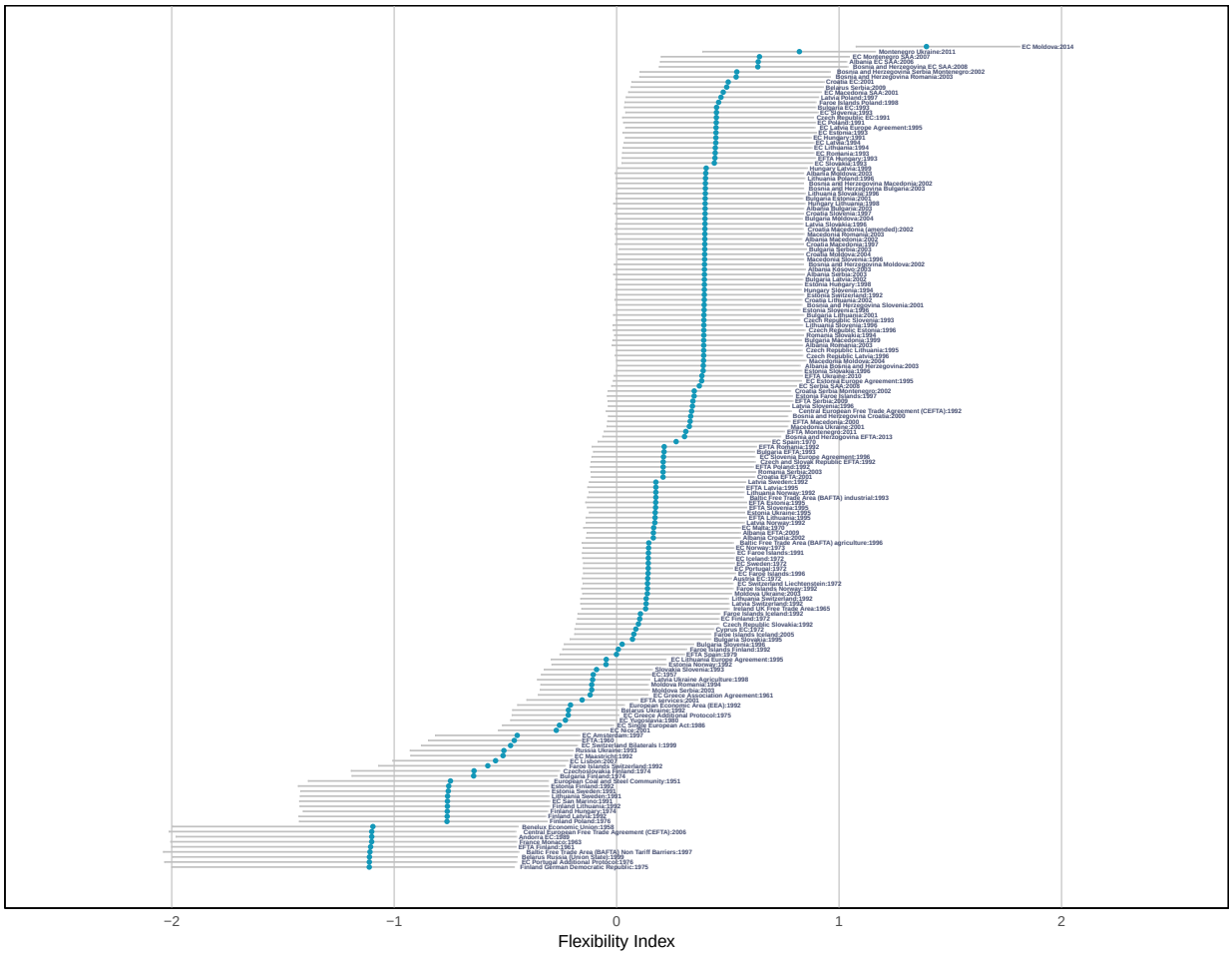

Figure 8: PTA Flexibility in European Countries

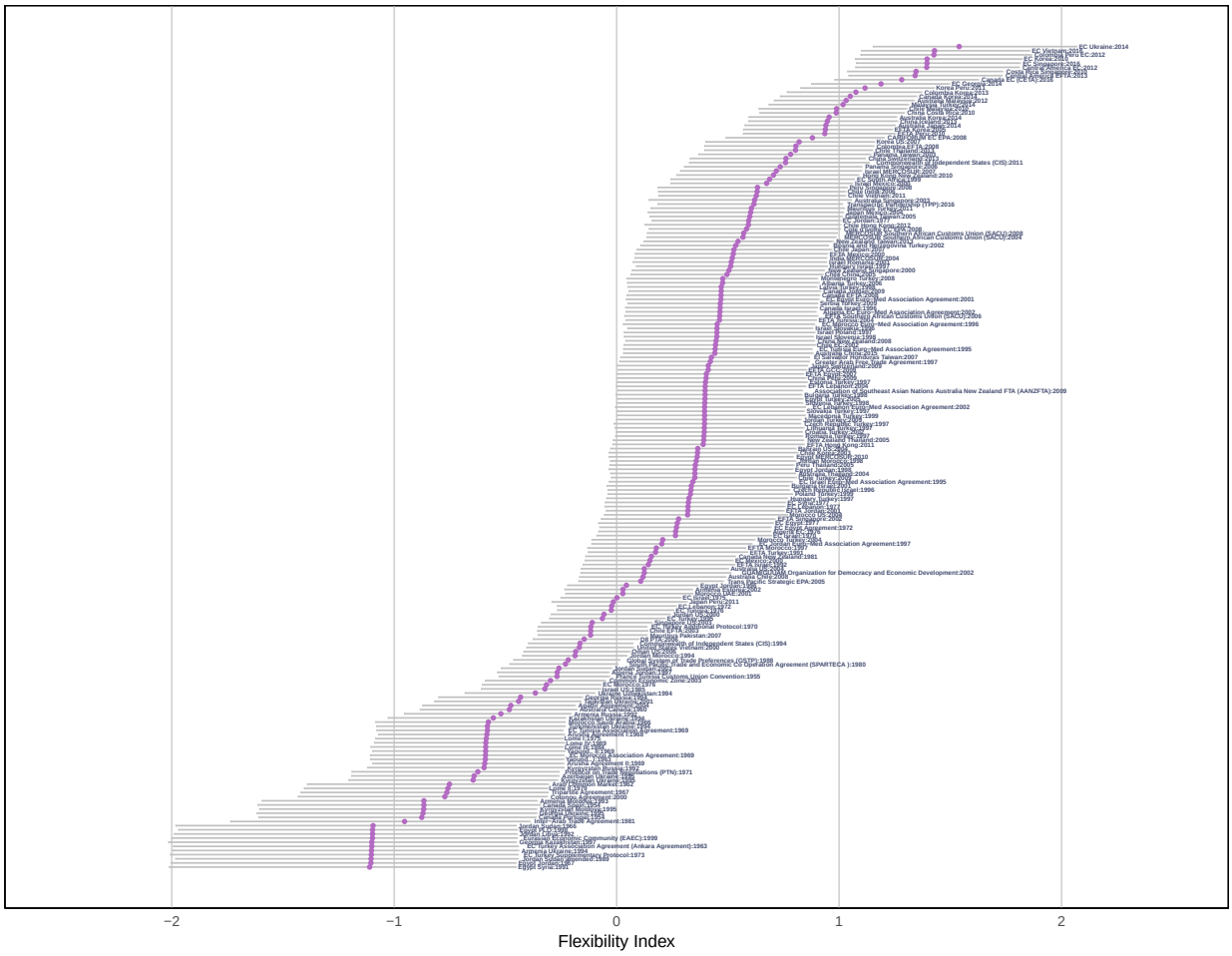

Figure 9: PTA Flexibility in Intercontinental Countries

C Additional Regression Results

C.1 Regression Results using Naive Measure of Flexibility

Existing literature examines the flexibility of PTAs using additive scores, i.e. summing the number of flexibility provisions (Kucik 2012; Dür, Baccini, and Elsig 2014; Allee and Elsig 2017). These approaches implicitly assume that including one flexibility provision is equivalent to including another. This may not be the case as some provisions may be more difficult to include than others. In addition, this rough measure does not allow for variations across PTAs.

To verify the effects of using this naive measure, I estimate the main regression models using this additive measure as a dependent variable. The results are reported in Table 3. In Model 1, 2, 4, and 5, agricultural support measures still have positive effects on PTA flexibility, but they do not have statistically significant effects. In addition, when I included the year fixed effects, a sign of the main independent variables has even changed.

	Dependent Variable: Naive Flexibility measure					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Producer Support (PSE)	1.045	1.120	-0.332			
	(0.752)	(0.701)	(0.383)			
Service Support (GSSE)				0.173	0.149	-0.067
				(0.419)	(0.388)	(0.460)
GDP per capita	6.207***	4.978**	0.066	5.987***	4.730**	0.114
	(1.914)	(1.857)	(0.804)	(1.857)	(1.790)	(0.788)
Trade volume	-1.995**	-1.224	-0.976**	-1.528*	-0.696	-1.041**
	(0.859)	(0.843)	(0.477)	(0.856)	(0.817)	(0.445)
Population	4.434	4.267	-3.342	3.546	3.310	-2.938
	(4.336)	(4.105)	(2.144)	(3.780)	(3.543)	(1.982)
MFN Tariff	0.211*	0.209	0.104	0.247*	0.245*	0.092
	(0.115)	(0.129)	(0.081)	(0.132)	(0.144)	(0.088)
Polity	-0.254	-0.255	0.050	-0.266	-0.268	0.047
	(0.221)	(0.224)	(0.163)	(0.218)	(0.224)	(0.176)
Democratization	-0.367	-0.022	0.951	-0.347	0.002	0.934
	(0.482)	(0.471)	(0.575)	(0.466)	(0.455)	(0.585)
GDP share	-0.007	-0.002	0.001	-0.007	-0.002	0.001
	(0.007)	(0.007)	(0.006)	(0.007)	(0.008)	(0.006)
Previous PTAs	0.065*	0.046	-0.001	0.067**	0.048	0.000
	(0.033)	(0.034)	(0.019)	(0.032)	(0.033)	(0.018)
WTO membership	-1.910***	-2.220***	0.799***	-1.924***	-2.234***	0.795***
	(0.453)	(0.530)	(0.284)	(0.455)	(0.533)	(0.283)
Americas		-0.811	-1.126		-0.772	-1.134
		(0.851)	(1.067)		(0.807)	(1.083)
Asia		-0.631	-0.266		-0.642	-0.261
		(0.403)	(0.440)		(0.386)	(0.452)
Europe		-1.362***	-1.120***		-1.354***	-1.124***
		(0.096)	(0.146)		(0.095)	(0.145)
Oceania		-2.770	0.022		-2.640	-0.098
		(2.319)	(1.496)		(2.327)	(1.732)
Intercept	-74.307	-78.163	92.350**	-64.450	-68.104	85.417**
	(72.871)	(68.684)	(40.445)	(67.037)	(62.402)	(37.754)
Country FE	✓	✓	✓	✓	✓	✓
Year FE			✓			✓
Observations	1,097	1,097	1,097	1,097	1,097	1,097
R-squared	0.024	0.024	0.111	0.007	0.006	0.124

Notes: All models are estimated using ordinary least squares. The dependent variable is naive flexibility measure. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

Table 3: The Effects of Agricultural Support on the naive PTA Flexibility

C.2 Regression Results with More Control Variables

Here, I include several more variables to control for unobserved bias. Instead of using MFN tariffs, I include applied tariff rates. It is calculated by simple averages for all products. I also include the overall level of government subsidies to control for government's welfare program effects. *Subsidy* refers to total subsidies and other transfers to general people. In addition, I include two fixed effects: Doha and Cold War fixed effects. As noted by Mansfield, Milner, and Rosendorff (2002), the Cold War era affects international economic relations and may have contributed to the establishment of PTAs. I also consider the Doha Round effects as that is the point countries began to turn their focus on bilateral and regional trade agreements.

Table 4 reports the results of regression analysis with more control variables. The main relationship between agricultural support and the design of flexible PTAs is not affected by these new control variables.

	Dependent Variable: Treaty Flexibility measure			
	Model 1	Model 2	Model 3	Model 4
Producer Support (PSE)	0.006**	0.006**		
	(0.002)	(0.002		
Service Support (GSSE)			0.001***	0.001***
			(0.000)	(0.000)
GDP per capita	0.080	0.055	0.085	0.057
	(0.118)	(0.118)	(0.121)	(0.120)
Population	-0.373	-0.369	-0.386	-0.380
	(0.333)	(0.331)	(0.333)	(0.332)
Trade volume	-0.216***	-0.212***	-0.220***	-0.216***
	(0.065)	(0.063)	(0.065)	(0.064)
Tariff	0.059***	0.065***	0.057***	0.064***
	(0.019)	(0.015)	(0.020)	(0.015)
Subsidy	-0.015	0.000	-0.017	0.000
	(0.022)	(0.000)	(0.024)	(0.000)
Polity	-0.029*	-0.030*	-0.028*	-0.029*
	(0.016)	(0.016)	(0.016)	(0.016)
Democratization	0.115	0.134	0.111	0.131
	(0.121)	(0.110)	(0.122)	(0.110)
GDP share	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	-0.002	-0.002	-0.001	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)
WTO membership	0.088***	0.087***	0.092***	0.091***
	(0.030)	(0.030)	(0.031)	(0.031)
Americas	0.008	0.010	0.010	0.012
	(0.165)	(0.162)	(0.165)	(0.163)
Asia	0.093	0.088	0.094	0.089
	(0.192)	(0.194)	(0.192)	(0.194)
Europe	-0.244***	-0.245***	-0.243***	-0.244***
	(0.020)	(0.020)	(0.020)	(0.021)
Oceania	-0.968***	-1.041***	-0.940***	-1.023***
	(0.224)	(0.195)	(0.236)	(0.199)
Intercept	11.435*	11.518*	11.730*	11.749*
	(6.531)	(6.542)	(6.523)	(6.539)
Country FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Doha FE		✓		✓
Cold war FE		✓		✓
Observations	1,079	1,079	1,028	1,028
R-squared	0.244	0.255	0.234	0.246

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 4: The Effects of Agricultural Support on PTA Flexibility with More Control Variables

C.3 Regression Results using Alternative Independent Variables

In this section, I attempt to use alternative independent variables that indicate the importance of agricultural sectors. I use rural labor share, rural population share, and land-labor ratio as alternative independent variables. According to the Hecksher-Olin theory, countries with an abundance of land relative to capital or labor will have a comparative advantage in agricultural production. I calculate an arable land per labor by dividing the total arable land by the total labor force in. countries.

Table 5 presents the results of using alternative independent variables and shows that rural labor share and rural population share are good predictors of defensive mechanisms of PTAs. Although land-labor ratio has positive effects on the PTA flexibility, it does not have statistically significant effects.

	Dependent Variable: Treaty Flexibility measure		
	Model 1	Model 2	Model 3
Rural labor share	0.000***		
	(0.000)		
Rural population share		0.002**	
		(0.001)	
Land - Labor ratio			0.009
			(0.174)
GDP per capita	0.168	0.006	0.315*
	(0.144)	(0.062)	(0.181)
Trade volume	-0.220***	0.032	-0.354***
	(0.074)	(0.032)	(0.093)
Population	-0.379	-0.043	-0.352
	(0.285)	(0.026)	(0.363)
MFN Tariff	0.036*	-0.020***	0.001
	(0.020)	(0.005)	(0.010)
Polity	-0.004	-0.009	-0.062*
	(0.020)	(0.016)	(0.031)
Democratization	0.082	0.099	0.084
	(0.082)	(0.065)	(0.081)
GDP share	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Previous PTAs	0.000	0.000	-0.006*
	(0.003)	(0.001)	(0.003)
WTO membership	0.027	0.024	0.116**
	(0.045)	(0.042)	(0.046)
Americas	-0.171	-0.166***	-0.213
	(0.189)	(0.063)	(0.093)
Asia	0.043	-0.198***	-0.096
	(0.109)	(0.071)	(0.074)
Europe	-0.237***	-0.198***	-0.241***
	(0.018)	(0.020)	(0.015)
Oceania	-0.755**	-0.011	-0.059
	(0.321)	(0.172)	(0.279)
Intercept	10.092*	0.485	12.328*
	(5.518)	(0.407)	(6.923)
Country FE	✓	✓	✓
Year FE	✓	✓	✓
Observations	1,152	1,495	1,405
R-squared	0.269	0.584	0.103

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 5: The Effects of Alternative Independent Variables on PTA Flexibility

C.4 Regression Results using Only Base Treaties

One might argue that some PTAs are a mere extension or amendment of previous PTAs. In this case, flexibility clauses are less likely to be included in PTAs for an extension and amendment of previous treaties. Thus, I exclude these PTAs from the dataset and only consider the base treaties. As shown in Table 6, the main effects still survive and do not affect by this exclusion of cases.

	Dependent Variable: Treaty Flexibility measure					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Producer Support (PSE)	0.010*	0.012**	0.008***			
	(0.005)	(0.005)	(0.003)			
Service Support (GSSE)				0.002**	0.002**	0.001***
				(0.001)	(0.001)	(0.000)
GDP per capita	1.376***	1.105***	-0.019	1.375***	1.092***	-0.100
	(0.313)	(0.299)	(0.100)	(0.315)	(0.301)	(0.094)
Trade volume	-0.347***	-0.170*	-0.185**	-0.369***	-0.181*	-0.158**
	(0.106)	(0.098)	(0.077)	(0.110)	(0.103)	(0.067)
Population	0.850	0.854	-0.559	0.898	0.830	-0.724*
	(0.709)	(0.641)	(0.358)	(0.710)	(0.656)	(0.381)
MFN Tariff	0.066**	0.078***	0.037*	0.060**	0.072***	0.041**
	(0.027)	(0.026)	(0.021)	(0.025)	(0.025)	(0.019)
Polity	-0.067*	-0.053	0.011	-0.062	-0.050	0.013
	(0.038)	(0.038)	(0.023)	(0.037)	(0.037)	(0.023)
Democratization	-0.163	-0.131	-0.017	-0.237***	-0.153**	0.054
	(0.099)	(0.077)	(0.077)	(0.072)	(0.069)	(0.060)
GDP share	-0.001	0.000	0.001	-0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	0.016**	0.012**	0.002	0.016**	0.012*	0.001
	(0.006)	(0.006)	(0.003)	(0.006)	(0.006)	(0.003)
WTO membership	-0.409***	-0.492***	0.067**	-0.382***	-0.469***	0.070**
	(0.081)	(0.090)	(0.033)	(0.081)	(0.092)	(0.033)
Americas		0.058	-0.074		0.049	-0.050
		(0.089)	(0.150)		(0.093)	(0.147)
Asia		-0.019	0.038		-0.019	0.040
		(0.066)	(0.106)		(0.066)	(0.107)
Europe		-0.309***	-0.249***		-0.309***	-0.252***
		(0.015)	(0.017)		(0.016)	(0.019)
Oceania		-1.569***	-0.870**		-1.480***	-0.946***
		(0.400)	(0.335)		(0.400)	(0.304)
Intercept	-18.272	-20.099*	13.927*	-18.506	-19.311	16.697**
	(12.496)	(11.401)	(7.099)	(12.529)	(11.629)	(7.558)
Country FE	✓	✓	✓	✓	✓	✓
Year FE			✓			✓
Observations	1,123	1,123	1,123	1,069	1,069	1,069
R-squared	0.009	0.008	0.200	0.006	0.007	0.165

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 6: The Effects of Agricultural Support on PTA Flexibility

C.5 Dealing with EU Cases

C.5.1 Replacing EU with Germany

One might also argue that including all member countries in PTAs unnecessarily inflate the number of observations, especially for the EU. To deal with this concern, I replace the EU with Germany and France and rerun the models. As Table 7 and 8 shows, it turns out that considering all EU member countries do not necessarily change the link between agricultural supports and the defensive designs of PTAs.

	Dependent Variable: Treaty Flexibility measure					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Producer Support (PSE)	0.182**	0.153**	0.080*			
	(0.089)	(0.082)	(0.049)			
Service Support (GSSE)				0.015*	0.019*	0.059
				(0.069)	(0.065)	(0.052)
GDP per capita	0.817*	0.616	0.195	0.916**	0.681	0.244
	(0.413)	(0.420)	(0.387)	(0.411)	(0.419)	(0.361)
Trade volume	-0.372**	-0.283	-0.576***	-0.453**	-0.351*	-0.631***
	(0.169)	(0.169)	(0.211)	(0.210)	(0.200)	(0.192)
Population	0.332	0.538	-0.718	0.892	1.009	-0.698
	(1.157)	(1.061)	(0.631)	(1.098)	(0.992)	(0.902)
MFN Tariff	-0.027**	-0.021	-0.006	-0.022*	-0.016	0.000
	(0.012)	(0.016)	(0.017)	(0.011)	(0.015)	(0.021)
Polity	-0.066	-0.065	-0.006	-0.082	-0.076	-0.004
	(0.090)	(0.080)	(0.058)	(0.100)	(0.091)	(0.068)
Democratization	0.137	0.199	0.124	0.057	0.134	0.108
	(0.181)	(0.171)	(0.139)	(0.196)	(0.179)	(0.155)
GDP share	0.001	0.002	0.002***	0.002*	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	0.006	0.005	0.001	0.007*	0.006	0.000
	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
WTO membership	-0.038	-0.059	0.213*	-0.126*	-0.136*	0.223***
	(0.077)	(0.079)	(0.111)	(0.072)	(0.070)	(0.071)
Americas		-0.181	-0.168*		-0.194	-0.168
		(0.186)	(0.091)		(0.182)	(0.201)
Asia		-0.069	0.025		-0.067	0.027
		(0.098)	(0.106)		(0.094)	(0.101)
Europe		-0.291	-0.351***		-0.314***	-0.362***
		(0.046)	(0.064)		(0.040)	(0.046)
Oceania		-0.272	-0.382		-0.341	-0.557
		(0.244)	(0.498)		(0.223)	(0.440)
Intercept	-3.608	-7.176	24.557**	-11.160	-13.395	25.453
	(16.041)	(14.726)	(11.536)	(14.589)	(13.148)	(16.627)
Country FE	✓	✓	✓	✓	✓	✓
Year FE			✓			✓
Observations	431	431	431	431	431	431
R-squared	0.011	0.104	0.003	0.028	0.04	0.0003

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 7: The Effects of Agricultural Support on PTA Flexibility

C.5.2 Replacing EU with France

	Dependent Variable: Treaty Flexibility measure					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Producer Support (PSE)	0.122*	0.093*	0.052***			
	(0.065)	(0.049)	(0.011)			
Service Support (GSSE)				0.051*	0.051*	0.024*
				(0.042)	(0.041)	(0.054)
GDP per capita	0.586	0.426	0.241*	0.590*	0.413	0.413
	(0.352)	(0.306)	(0.137)	(0.316)	(0.308)	(0.385)
Trade volume	-0.450**	-0.363**	-0.148	-0.558***	-0.455***	-0.656***
	(0.157)	(0.148)	(0.092)	(0.158)	(0.154)	(0.185)
Population	1.567	1.605**	0.128*	2.129***	2.034***	0.404
	(1.221)	(0.672)	(0.077)	(0.647)	(0.639)	(0.963)
MFN Tariff	-0.022*	-0.014	0.001	-0.018	-0.010	-0.004
	(0.013)	(0.016)	(0.007)	(0.015)	(0.016)	(0.020)
Polity	-0.037	-0.036	-0.027	-0.036	-0.035	-0.019
	(0.081)	(0.054)	(0.018)	(0.055)	(0.055)	(0.065)
Democratization	0.043	0.088	0.191***	-0.031	0.026	-0.023
	(0.185)	(0.136)	(0.072)	(0.141)	(0.137)	(0.180)
GDP share	0.001	0.002***	0.002*	0.002**	0.003***	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Previous PTAs	0.013**	0.012**	0.004**	0.015***	0.014**	0.007
	(0.005)	(0.005)	(0.002)	(0.005)	(0.005)	(0.006)
WTO membership	-0.067	-0.137	0.025	-0.109	-0.172*	0.246**
	(0.111)	(0.092)	(0.059)	(0.088)	(0.091)	(0.115)
Americas		-0.174*	-0.180		-0.188**	-0.166
		(0.092)	(0.146)		(0.093)	(0.199)
Asia		-0.073	0.032		-0.066	0.013
		(0.108)	(0.059)		(0.108)	(0.094)
Europe		-0.298***	-0.407***		-0.310***	-0.344***
		(0.063)	(0.056)		(0.063)	(0.050)
Oceania		-0.461	-0.515		-0.475	-0.625
		(0.493)	(0.321)		(0.494)	(0.490)
Intercept	-20.203	-21.305**	-0.408	-26.624**	-25.832**	6.330
	(17.474)	(10.720)	(0.562)	(10.473)	(10.356)	(17.523)
Country FE	✓	✓	✓	✓	✓	✓
Year FE			✓			✓
Observations	431	431	431	431	431	431
R-squared	0.016	0.0226	0.488	0.013	0.013	0.151

Notes: All models are estimated using ordinary least squares. The dependent variable is *flexibility* index. Robust standard errors clustered by country in parenthesis. All specifications include country fixed effects. Africa is the omitted comparison group for the regions. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 8: The Effects of Agricultural Support on PTA Flexibility

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