

How Preferential are Preferential Trade Agreements? :

Analysis of Product Exclusions in PTAs

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Abstract

Many studies on preferential trade agreements (PTAs) tend to consider a trade agreement as a binary choice: either a particular country chooses to establish a PTA with its partners or it does not. However, free trade agreements are not alike. The value of preferences in PTAs can vary tremendously and may even be different towards different partners, which is embodied in the list of product exclusions of a PTA. A detailed examination of product exclusions sheds a light on the value of preferences in PTAs. This study examines the pattern of product exclusion in several PTAs and explores relevant factors influencing the decision to include or exclude a particular product. The econometric estimation in this study indicates that product exclusions in PTAs are partly the outcome of a bargaining process conducted by negotiating countries, but at the same time the trade policy of the reporting countries heavily influences the decision to exclude a particular product.

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1. Introduction

1.1. Objectives of The Study

While one of the basic principles of multilateral trading system under the WTO requires the member countries to apply the principle of non-discrimination, famously known as Most Favored Nation (MFN), it also provides an exception that allows its members to give a series of tariff concession to a certain number of countries. The preferential trade access usually comes as a part of a preferential trade agreement, which commonly goes regional, comprising of countries that are regionally closed, or most frequently as a free trade agreement involving two or more countries with significant trade activities. Preferential trade agreement has become words of fashion in economic world, as virtually most countries are involved in at least one short of preferential agreement with others. As of January 2008, there are 199 PTAs that have been in force and notified to the WTO, and more others are still in the negotiation process or underway for the implementation.

The vast popularity of PTA might be attributed to the discriminatory nature of this type of trade agreement, which allow countries to provide greater market access to selected partners and maintaining protection to other trading partners. This partial liberalization offers bigger chance for the countries to maximize political economic gain from trade¹. Preferential treatment in PTA is not only limited to partner countries and the rest of the world. A country engage in a PTA may also extent the discriminatory treatment by differentiating market access provision to different partners with which it forms agreements.

This characteristic of preferential treatment in PTA is embodied in the list of products that are excluded from greater market access provision in an agreement. This list, known as product exclusion, is a common feature to current trade agreement, particularly the preferential one. It is related to the fact that preferential liberalization in a PTA does not apply immediately after the agreement comes into force; there are certain periods and conditions before products are fully liberalized exclusively to the partners. The staging of

¹ While economic theory shows that free trade offers biggest advantage from trade, countries usually pursue liberalization through trade agreement. Theoretical framework section presents one explanation to PTA. More general explanation on trade agreement can be found in Bagwel and Steigler (2002)

liberalization and exclusion from preferential provision may be different from one agreement to another, leading to discriminatory treatment to different partners.

This study is an attempt to examine the pattern of product exclusion in several PTAs and to look at factors influencing the decision to include or exclude a particular product. There are some aspects of PTA that can be derived by looking at product exclusion in careful way. An examination of product exclusions allows better understanding to the discriminatory nature of PTA. While discriminatory treatment between partner and non-partners is a familiar feature of a preferential trade agreement, discrimination between different partners is less recognized. Product exclusions in a PTA reflect the latter type of discriminatory feature of the trade agreement.

A study on the pattern of product exclusions also provides an insight to bargaining process behind tariff concessions in PTAs. One concern about PTA is associated with the negotiation process between the countries involved, particularly the one involving developed and developing countries. It is a general perception that negotiation process of a PTA tend to give more bargaining position to the more powerful economies in order to pursue their interests and to put pressure on the less powerful ones. There is also a suspicion that big countries tend to follow certain “templates” in conducting trade negotiation, which give less room for negotiation, particularly to the developing countries.

Grossman and Helpman (1995) explain that product exclusion is an outcome of a bargaining process in a PTA negotiation. It serves as a solution to accommodate conflicting interests from the two countries involved. The decision to include or exclude a product reflects the equilibrium between those two conflicting interests. Looking at various factors affecting product exclusions from both sides provides information on how bargaining process conducted in a PTA negotiation.

The study is organized as follow. After looking at how this study fits into the existing literature of trade agreements and how it relates to other studies in the field, Section 2 provides descriptive picture on the pattern of product exclusions. It is followed by a section briefly explaining theoretical framework that accounts for product exclusions in PTAs, which form a basis for methodology and strategy used in the empirical work. Section 4 present and discuss the results of the empirical work. The final section presents the conclusions and a discussion of the policy implications.

1.2. Related Literature

Looking at the literatures on PTA, one can loosely classify them into the ones explaining the effect of PTA and the literature that looks at the motivations behind the formation preferential agreement. The first category, which has been discussed for quite a long time in academic analysis and policy making, relates to the welfare effects of PTA, both to the participating countries and to the non-members. While the formation of a PTA can be seen as a move towards freer trade by eliminating barriers to trade, there are various concerns over the formation of a PTA. Concerns over preferential trade liberalization revolve around the discriminatory nature of PTAs. As early as 1950, Viner has noticed that PTA might lead to welfare reduction to the extent of trade diversion occurred as a result of limited liberalization. The work from Viner underlines the second-best nature of preferential free trade. The theoretical debate has also encouraged empirical works on the effect of PTA and economic welfare, to find the evidence of famous terms of trade creation and trade diversion.

The nature of second-best from PTA gives rise to another question regarding the effect of a PTA: if PTA is the second-best solution, how it affects the first-best solution of having global free trade arrangement? The question whether proliferation of PTA would be a building or a stumbling block towards the goal of reducing trade barriers worldwide is a central question in this type of studies on PTA². Discussions on the effects of PTA on multilateral trading arrangement mostly focus on factors that encourage or discourage PTA members to also engage in multilateral negotiation³. Several empirical works has also contributed to the discussion, most notably the work from Limao (2006), who directly compare tariff reduction under preferential agreement and MFN tariff of the US.

Beside the impact of PTA, some studies try to provide explanations on why countries are eager to form preferential agreement. These studies are quite distinct from the previous one as they, simply put, place PTAs as the left hand side variable of the equation, while other studies find PTA in the right hand side.

² Bhagwati, Greenaway and Panagariya (1998) differentiate the first and the second types of the study by referring to static and dynamic effect of PTA respectively.

³ See for example Levy (1997) or Khrisna (1998), or more recently Furusawa and Konishi (2007). Domino effect from Baldwin (1993) offers different perspective by explaining situation to support the enlargement or creation of PTAs, which eventually setting up foundation for global free trade.

The mainstream of this type of literature explores what factors influencing the likelihood of pairs of countries in forming a PTA. One essential feature of these studies is the use of binary choice on the decision of countries to form a PTA or joining an existing one. That treatment finds a solid ground of real-life practice based on Article XXIV of GATT that requires PTA to be formed as a complete agreement, not a partial one. A notable study from Baier and Bergstrand (2004) empirically explores economic reasons behind the formation of PTAs. Several other studies provide theoretical explanations on the phenomena, ranging from the failure of multilateral trade negotiation to competition of market access and foreign investments⁴.

Early studies on the endogeneity of PTAs revolve around models that treat countries as unified rational actors seeking to maximize national welfare. Grossman and Helpman (1995), latter on GH95, offers political economy motives on the formation of a preferential trade agreement. This theoretical model takes into account bargaining process between governments involved in the negotiation, as well as the domestic political economy process. The decision in this model is taken in two stages. The first stage involves political competition and bargaining process between different interest groups in the government's decision by means of political contribution. The second stage of the process takes place in an international negotiation between governments. Each stage affects the other one. In this model governments can no longer negotiate preferential agreements that would simply maximize welfare, but rather constraints by domestic political economy environment.

Since special interest groups in each country also try to influence the negotiations in order to prolong the existing protection they have received, there are a set of domestic industries that are perceived as sensitive. While the decision of participating in PTA is a binary choice in country level, the political-economy process takes place on industrial or product level. This process forces the governments of the countries to negotiate tariff concessions among them, including provision of product exclusion in the agreement. The outcome of the negotiation is affected by bargaining power of the two countries involved. Instead of looking at the decision of entering a PTA as a binary variable, this model explains the variation of outcome in the form of product exclusion.

⁴ See for example Mansfield and Reinhardt (2003) for multilateral reason, and Baldwin's domino theory (1993) for competition and interdependency effect.

This has a solid foundation in the real world. While GATT article XXIV does not allow member countries to form a partial PTA, in practice the structure of agreement itself depends on negotiation between participating countries, which leads to a huge variation in the implementation of trade agreements. The fact that product exclusion is a common feature of most PTAs, and also variation of other common features across PTAs, gives motivation to look at the presence of trade agreements not only as a binary variable. However, only few studies on determinants of PTA focuses on those specific aspects of the agreement, such as variation on the rule of origins and different provision of tariff concessions, including the presence of product exclusions⁵.

To our knowledge, only one study looks at the presence of product exclusions in PTAs. Using the model from GH95 as the basis for empirical work, Gawande, Sanguinetti and Bohara (2001) investigate product exclusions in a PTA between Argentina and Brazil. The paper finds that products having trade creation effect after the PTA takes place are likely to be excluded, as in line with the hypothesis in GH95. The proposed empirical specification in the paper prevents them to do a larger scale cross-country examination on product exclusions due to the availability of data and information required. Another study from Olarreaga and Soloaga (1998) also briefly examine the lack of common external tariff in Mercosur when explaining the endogenous tariff formation in the common market.

In the same spirit of the two papers above, this paper empirically examine the presence of product exclusions in the preferential trade agreements. Different from the previous study, this study is a cross country examination looking at the pattern of product exclusions in various PTAs using the theoretical model developed in Grossman and Helpman (1995) as theoretical background.

⁵ Studies in this branch of the literature are very scarce. See, for example, Kowalczyk and Davis (1996), for example, analyze the feature of tariff phase-outs in trade agreement, particularly for the case of NAFTA; Portugal-Perez (2006) looks at the determinants of ROO and found that political-economy factors increase the restrictiveness of rules of origin implemented in an FTA.

2. Product Exclusions in PTAs: Descriptive Analysis

Pattern of product exclusions in PTAs provide insight on several aspects of negotiation and bargaining process in bilateral trade agreements. In this section we explore the pattern of product exclusions in several major PTAs for a starting point of further empirical analysis. This descriptive analysis shows discriminatory treatments in the agreements that extend not only between partners and the rest of the world, but also across different agreements.

2.1. Product Exclusions: Data Construction

The analysis will be carried out by looking at a sample of product exclusions in 15 bilateral agreements. This sample represents bilateral agreement of the four largest trading economies: United States, European Union, Japan and Canada, with their main trading partners. This sample aims to cover agreements between industrialized and developing countries, as well as among industrialized countries themselves to give better picture on the bargaining. However, there are only few agreements currently takes place among industrialized countries. Table 1 presents agreements in the sample of this empirical analysis, along with the information about time table of the agreements.

Table 1. Sample of Preferential Trade Agreements

Reporter	Partner	Launched	Negotiation
US	Australia	2004	March 2003 - March 2004
US	Canada	1994	1991-1992
US	Korea	2007	Feb 2006 - Feb 2007
US	Mexico	1994	1991-1992
US	Morocco	2006	Jan 2003-Feb 2004
US	Peru	2007	May 2004 - Dec 2007
Japan	Malaysia	2006	Dec 2003-Dec 2005
Japan	Mexico	2005	Oct 2002-Sept 2004
Japan	Thailand	2007	Dec 2003-Apr 2007
Japan	Chile	2007	Nov 2005-Sept 2006
EU	Mexico	2000	Oct 1998-Nov 1999
EU	SA	2000	1998-July 1999
Canada	Chile	1998	Dec 1995-Dec 1996
Canada	Mexico	1994	1991-1992
Canada	US	1994	1991-1992

Product exclusions in a PTA is decided at the original tariff line of each reporting countries in Table 1, making the number of products for each countries varies accordingly. Some

countries implementing 10 digits HS code for their tariff structure might report around 8,000 to 10,000 products, while others use less classification of 8 or 9 digits that makes up to 8,000 products. Each product in the tariff line is then categorized into binary classification which 1 represents the products included in a PTA with a particular trade partner and 0 for the products excluded from the agreement. While in principle the definition of excluded product is relatively clear, the coding of a product into binary variable for inclusion or exclusion in a particular agreement is far from straightforward.

Detail inspection on the text of our sample of agreements shows that there are four main possibilities of the outcome of agreement: (i) for some products, import tariffs were either removed completely when the agreement came into force or the MFN tariffs were already zero; (ii) import tariffs of other products in the agreement were reduced consecutively to zero in several years, beginning at the first year of implementation; (iii) a small number of products might be temporarily excluded from the agreement by having a series of reduction until the tariff reach zero starting from several years after the agreement came into force; (iv) lastly, a very small number of products in various agreements were permanently excluded from the agreement.

For our analysis, the list of product exclusion from our sample of agreements is constructed by classifying products that do not receive preferential tariff in the first year of the PTA's implementation. This includes all products that are temporarily and permanently excluded from the agreement. Products receiving preferential tariff right after the introduction of PTA, both with complete elimination or sequential reduction, and those with zero MFN tariff are classified as products included in the agreement. In short, products fall at category (iii) or (iv) are treated as the excluded products, while the rest as the included products.

The coding process needs also take into consideration the presence of non-tariff barriers negotiated in the PTAs, namely the application of tariff quota. Tariff concession for certain products might only valid to limited amount of imports from the partner country⁶. The presence of tariff quotas reduces the provision tariff concessions on those particular products. Subjective judgment is needed to classify these products into excluded or

⁶ Trade agreement between US and Australia, for example, provide duty free opportunity for imported butter from Australia. However, this duty free provision subject to a quota, which is no more than 3000 tonnes per year for the first year of implementation. For exceeding amount of imports, butter from Australia is subject to normal MFN tariff rate.

included ones. In this coding process, an arbitrary threshold of 50% of bilateral imports from the partner countries is set. If the quota for good in question is less than 50% of its bilateral imports, the good is declared to be excluded from PTA. In some cases, the situation is more complicated, since the tariffs applied for the exceeding amount of imports after the quota is fulfilled, is lower than the MFN tariff for those goods. In our sample, those goods are classified as the products included in the agreements.

2.2. Descriptive Analysis

While agreements in our sample specify the schedule of tariff elimination for each countries involved, our dataset is constructed based on the tariff elimination schedule of reporting countries in Table 1. Thus the dataset on “product exclusion” refers to products excluded, in the sample agreements from the perspective of the United States, the European Union, Japan and Canada only.

Table 2. General Picture of Product Exclusions

	Total Observations		Non Zero Trade		Non Zero Bilateral Trade	
	No.	%	No.	%	No	%
Excluded	11,058	7.37	11,008	7.36	7,658	6.71
Included	138,950	92.63	138,643	92.64	106,512	93.29
Total	150,008	100	149,651	100	114,170	100

Source: Author’s Calculation

There are 150,008 tariff lines described in the dataset constructed from 15 agreements in our sample. As previously mentioned, the definition of products represented in each tariff line varies slightly from one country to another, although the product classifications follow international consensus up to 6 digit classification. Table 2 presents general picture of product exclusions in the sample. There are around 7.3% of tariff lines in the dataset, comprising around 11 thousand products, classified as products excluded, either temporarily or permanently, from the trade agreements. Looking at only on tariff lines in which reporting countries recorded bilateral trade with their partners during the negotiation period, proportion of excluded products falls to only 6.7%.

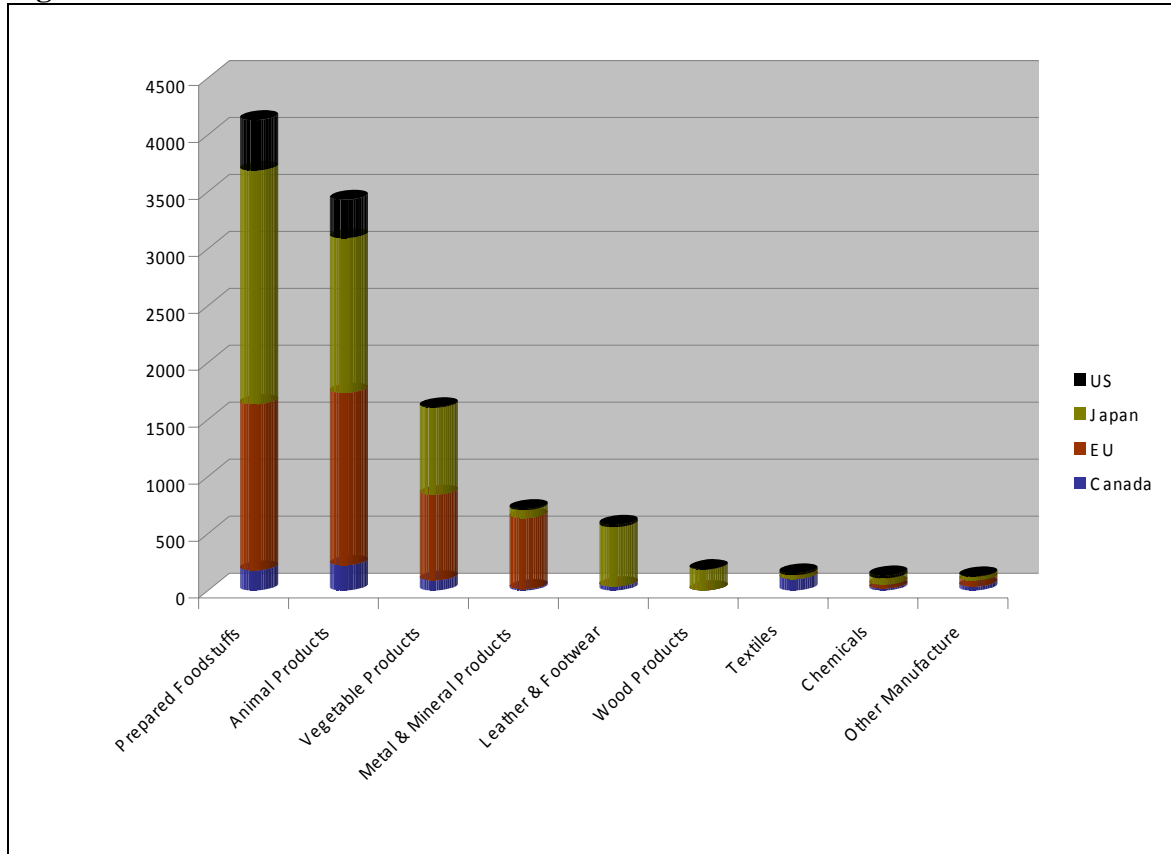
One interesting feature of the list of excluded products in the sample agreement is that the exclusion of a product from a country’s list of tariff concessions does not need to be matched by the exclusion of a similar product in the other’s. It is quite sensible to expect

that when a reporting country put a particular product into its exclusion list, the partner would also exempt the product from its preferential treatment. However, the dataset only shows that less than 30% of products, classified at 6 digit HS, that are excluded from tariff elimination schedule of the reporting countries, are also excluded in the partner countries' schedule. While it is somewhat difficult to do comparison in the original tariff line level, the real percentage of match excluded products is likely to be lower. This indicates that each negotiating countries hold a great range of flexibility in determining which products to be in each country product exclusion list. In fact, most agreements do not specify reciprocity principal in the schedule of tariff elimination. Some exceptions appear on the agreements involving Japan, particularly for certain products such as textile and footwear, which require the partner countries to provide tariff concession in order to obtain preferential treatment from Japan.

Agriculture and food products are known as the most protected products in many countries, including countries involved in the trade agreements in our sample. The same attitude towards agriculture and food products can also be observed easily in the list of product exclusion. Of all agriculture and food products represented in 20,915 tariff lines recorded in the sample, around 27% are among products that are excluded from the provision of tariff elimination. In comparison, only around 1% of manufacturing products are excluded from the agreements. This pattern is commonly observed across all reporting countries. Japan, for example, maintain MFN tariff rate of 40% of agriculture and food products for its partners in the preferential trade agreements. Figure 1 presents more detail breakdown of product exclusions across reporting countries categorized into several aggregated product classifications.

Among four reporting countries in the sample, United States recorded the smallest number of products in the exclusion list. Six agreements in the sample revealed that only around 1% of the products are excluded from the agreements between the US and its main trading partners, mostly on agriculture and food products. Meanwhile, Japan places significant numbers of products in the exclusion list of its four trade agreements in the sample. Around 13.5% of tariff lines described in Japan's trade agreements with four trading partners are exempted from preferential treatment, at least temporarily. European Union is also quite firm in giving preferential concession to its trading partners, mostly because of the application of tariff quota following the provision of tariff concessions.

Figure 1. Breakdown of Product Exclusions



Source: Author's Calculation

Our dataset also reveals another interesting feature on how the set of excluded product from a particular reporting country differ towards one partner to another. A quick look of list of product exclusion demonstrates that there is preferential treatment among different partners of preferential trade agreements. Looking at only trade agreements pursued by the US during the period of 2000's, we can see that while the country puts 315 tariff lines into the list of excluded products in the agreement with Australia, it agrees to put only 103 lines as excluded products in the agreement with Peru. Although in less striking scale, other countries follow similar pattern. Japan has 1320 tariff lines excluded from preferential treatment to Chile, while it retains 1180 in the agreement with Thailand.

Table 3 presents one way to look at differences between trade agreements. The table give a picture on the number of products appear in product exclusion lists of the agreements involving the reporting countries of Table 1. The first three columns provide the number of products excluded in all agreements for each reporting country, while the last three presents the number of products excluded.

Table 3. Product Exclusions in Each Agreement

Products	Number of Excluded Products Appears In					
	All Agreements			At Least One Agreement		
	US	Japan	EU	US	Japan	EU
Prepared Foodstuffs	48	370	514	179	697	944
Animal Products	7	270	481	143	417	1034
Vegetable Products	0	137	323	3	312	428
Metal & Mineral Products	3	0	0	9	146	624
Leather & Footwear	1	55	0	20	194	0
Wood Products	0	26	0	1	72	0
Textiles	12	6	0	25	21	0
Chemicals	11	4	8	24	52	26
Other Manufacture	9	0	0	14	77	53
Total	91	868	1326	418	1988	3109

Source: Author's Calculation

From 179 food products excluded in the US agreements with six partners, only 91 appear in all agreements, while 88 others are excluded only in one or more agreements. Sugar product and confectionary, such as chocolate, appears to be excluded in most US agreements, while some dairy and animal products exclusively excluded in the agreement with Australia. The same pattern can also be observed in Japan and European Union's product exclusion list. Only small number of products is excluded in all agreements. Some are just excluded specifically to a certain partner.

The differences in product exclusions across trade agreements with different partners provide evidence toward the discriminatory feature of PTAs that does not only distinguish the PTA's partner and the rest of the world, but also between different partners. This finding does not confirm common perception towards preferential trade agreements, particularly the ones involving big countries like those in the sample. It is commonly believed that trade negotiators pursue trade talks with a specific agreement template on hand and limit the bargaining process in the negotiation. The product exclusion lists in our sample shows that the bargaining process might lead to different outcomes to different partners, at least for tariff concessions.

2.3. Analysis of Variance

An alternative way to look at differences in product exclusions across bilateral trade agreements is by looking at the tendency of exclusion or inclusion for a particular product in each agreement using an analysis of variance. The idea behind this analysis is to examine whether there is a significant differences in the likelihood of a product for being included in a particular agreement with the likelihood for being included in other agreements. Ideally, the comparison should be conducted at the original tariff line level, using a binary and a

probability model. However, since the classification of products in original tariff line differs in each country the analysis is carried out by comparing products at 6 digit HS level.

At this classification, we no longer look at whether a product is excluded or included. Rather we see the proportion of the included tariff lines (at original tariff line level) in each HS 6 digit classification. With this consideration, the analysis of variance is conducted by running an OLS regression on the specification below.

$$\Pr(I)_{ji} = \beta_{1j} \text{CountryPair}D_j + \beta_{2i} \text{Product}D_i + e_{ji} \quad (1)$$

Where $\Pr(I)_{ji}$ is a proportion of included tariff lines in product i (classified at HS 6 digit) in trade agreement j . $\text{Product}D_i$ refers to dummy variables for each HS 6 digit product, $\text{CountryPair}D_j$ represents dummy variables for each agreement in our sample. Coefficient β_{2j} captures the mean of proportion of included tariff lines for each product, while coefficient β_{1j} captures the deviation from mean for each agreement. A statically significant coefficient associated to a particular country pair indicates that the agreement between that country pair treat products differently from a benchmark agreement. Furthermore, a significant F test on all coefficients β_{1j} in the above specification signify the differences between agreements in handling exclusion of products.

Table 4 present the results of this regression. All coefficient of β_{1j} appear to be significant except for PTA between Canada Chile. In this regression, the US-Canada bilateral trade agreement is set as a benchmark for proportion of product inclusion. The estimated coefficients can be interpreted loosely as the additional proportion of the included tariff lines at HS 6 digit level compare to the proportion in US-Canada trade agreement. A particular HS 6 digit at the US-Morocco trade agreement, for example, include 1.1% more tariff lines than the same HS 6 digit in the US-Canada agreement.

To see whether agreements involving a particular reporting country in our sample deals with a specific product coming from different partners differently, we need to conduct the F test for the relevant coefficients. The F-test on all coefficients β_{1j} shows that the overall differences are significant. The F-test for all agreement involving the United States also indicates that products are treated differently in trade agreements with different partners. Similar results can be observed on other trade agreements.

Table 4. Coefficient of Country Pair Dummies and ANOVA Tests

Trade Agreement	Coefficient	Standard Error
Canada - Chile	0.001	0.002
Canada - Mexico	-0.064***	0.004
Canada - US	0.003***	0.001
EU - Mexico	-0.052***	0.004
EU - South Africa	-0.125***	0.005
Japan - Chile	-0.093***	0.006
Japan - Malaysia	-0.082***	0.005
Japan - Mexico	-0.120***	0.006
Japan - Thailand	-0.080***	0.005
US - Australia	0.004***	0.002
US - Korea	0.013***	0.002
US - Mexico	0.001**	0.001
US - Morocco	0.011***	0.002
US - Peru	0.012***	0.001
F Test of β_1 (overall)	212.54***	
F Test of β_1 (US)	8.6***	
F Test of β_1 (Japan)	110.04***	
R Square	0.072	

Note: *** Significant at 1% level of significance, ** 5% level of significance

Again, our analysis does not show that a specific reporting country deals in similar way towards different partners. There is no evidence that the agreements are based on a definite agreement “template” that remove bargaining process in the negotiation. Rather, we find that product exclusions in PTAs extends the discriminatory nature of the agreement by excluding different products towards different partners. The next section explores some evidences of bargaining process in product exclusions using a theoretical framework developed by Grossman-Helpman (1995)

3. Theoretical Framework and Empirical Strategy

This section provides brief discussion on the theoretical framework in looking at the presence of product exclusions in a PTA. Unfortunately, theoretical work explaining such occurrence appears only in the work of Grossman and Helpman (1995) discussing political economy process behind the formation of a PTA. The theoretical model in GH95 would be discussed in order to provide guidance to empirically examine various factors behind the decision of a product being included in a PTA. The discussion on theoretical framework is presented in more informal way. The proposed empirical specification that follows is related to the theoretical model.

3.1. Political Economy of Preferential Trade Agreement

Grossman-Helpman model of preferential trade agreement discusses the situation in which two countries decide to form a PTA. GH95 presents the decision process involving two stages of strategic action. The first stage involves domestic political process between various interests in the economy to determine government's policy preferences. The subsequent stage is conducted in international level, where the concerned government negotiates each other to form the trade agreement. Each stage influences the decision taken in another stage. The international negotiation sets a certain parameter for domestic political process, while at the same time it is constrained by domestic political-economy interests.

In order to understand the process behind the formation of a PTA, we need to see how government's policy preference is determined in the domestic level. Grossman-Helpman (1994) develops a model to explain domestic political-economy process behind trade policy formulation. The model is based on multiple principals-agent problem. It sees trade policy as an equilibrium outcome of government as the agent that sets trade policy and interest groups as principals.

The government as policy maker receives contribution from various interest groups as an attempt to influence policy decision. This government, or more exactly politicians in the government, values the political contribution as it helps them in the next election. But the government also pays attention to general welfare of the economy as it increases their

credibility. Therefore, the government is trying to maximise a weighted sum of general welfare and political contribution from interest groups. This problem can be represented by the following government objective function.

$$\max G = aW + \sum_i PC_i \quad (1)$$

where W represents general welfare of the economy, and a is a weight of government's valuation of general welfare, while PC_i measures political contribution associated to industry or interest group i . The general welfare composes of various components of the economy, in particular consumer surplus, labor income, profits and tariff revenue.

Industries are willing to provide political contribution since trade policy increases the domestic price of goods, which in turn raise profits for the related industries. Thus industries have a strong incentive to influence policy in order to increase good's price. More organized industries find it easier to provide sufficient contribution that makes the government agree to set favourable policy. Their objective function is to maximize net profits, that is profits after political contribution.

$$\pi_i(p_i(\tau_i)) - PC_i \quad (2)$$

This political interaction between interest groups representing industries and the government determines trade policy implemented for products from industry i . While the model in GH94 is intended to explain trade policy structure across industries, this model also serves as a basis to look at what happens in the domestic political economy process during PTA negotiation.

Suppose that the governments of country A and B are in the process of negotiation for a PTA. Knowing that their governments are pursuing trade agreement, which might alter domestic price of goods and their profits, industries in each country change their political contribution following the action. If the governments decide to pursue on the PTA, the government's objective function for each country would change as much as

$$\Delta G^j = a\Delta W^j + \sum_i \Delta PC_i^j \quad \text{for } j = A, B \quad (3)$$

As mentioned above, the change in government's objective function depend on the change in general welfare, which compose of consumer surplus, tariff revenue and profits of industries,

and political contribution. From (2), we can deduce that in equilibrium political contribution that an interest group agrees to give equals to its profits π_i . Therefore (3) can be written as

$$\Delta G^j = a\Delta W^j + \sum_i \Delta \pi_i^j \quad \text{for } j = A, B \quad (4)$$

What happens to general welfare and profits of industries after the agreement in force determines the change in government surplus, which in turn affect the government's decision towards PTA. Therefore it is necessary to look at the effect of PTA on those three aspects.

If we have country B as an exporter of a specific product i , while country A acts as importing one, we can assume that price of i is higher in A than B , as a result of higher tariff in A : $p^a(t^a) > p^b(t^b)$. Under the PTA producers in B would be able to export their product to country A facing lower tariff barriers than the rest of the world. The effect of PTA to producers of i both in A and B might vary depends on various factors. GH95 gives three illustrations on the effects of PTA to the government objective in (4) and its components.

The first case is a situation where PTA results in an enhanced protection for exporting country producers. Suppose that country B , despite being an exporter, does not really have sufficient capacity to satisfy import demand in A at the associated domestic price of p^a . As a result, there is no change in the domestic price of i in country A . Producers in country B are now enjoying higher price and profits by exporting their products to country A . Profits of the import competing producers in A remain unaltered by the provision of lower tariff to exporters from B , as the price remains the same. Consumers in A also do not get benefits from the PTA. The only negative effect in this situation might come from the foregone tariff revenue previously collected by the government.

The opposite case takes place when exporting country producers has a capacity that allows them to fulfil the whole import demand at the lower price p^b after PTA takes place. This leads to price decline of the product in A . In equilibrium the price would fall to the level faced at exporting country. In this case, preferential tariff concession would lead to "trade creation". The trade creation effect makes the exporters receive the same level of price as it gets in B and do not enjoy additional benefits from PTA. On the other hand, import competing producers has to suffer from price decline, while consumers in A gain welfare benefits from lower price of the product. Government of country A loses its tariff revenue as imported price would no longer

pay tariff. In this situation, protection for import competing producers in A is reduced to the same level of country B .

The third case is an intermediate situation in which producers in B can only meet demand of i in country A for a certain level of price between p^a and p^b . In this situation the price level in A would fall, making the import competing producers losing their profits, while consumers enjoy higher consumer surplus from lower price. Government of country A again loses its tariff revenue.

From the illustrations, we can see that the effects of a PTA depend on the ability of exporting producers to fulfil the demand in importing countries. The effects to different parties in each participating country vary accordingly. The government in each country takes into account the changes in welfare of various groups in the economy as it might change political contribution it receives or general welfare of the economy. Each case leads to different support of PTA in the domestic level.

In the first case, government in country A would find that import competing producers feel indifferent to the PTA; neither support nor opposition towards PTA from producers. As the agreement does not change consumer welfare, the government might think that PTA does not change general political preference. However, if the forgone tariff revenue quite significant, the government may oppose conclusion of the agreement. Different situation might be observed in country B . As the profit of exporting producers increase, the government might gain supports in terms of political contribution to push for the PTA.

In the reduced protection case, the opposition towards PTA would take place in country A . Import competing producers would reduce their political contribution due to the fall in profits. But the government gains political support from consumers. The final change in government's objective function depends on the magnitude of change in contribution and how important general welfare accounted in the objective function. If the producers are less organized or have little economic power, and the government values general welfare higher, the change in political contribution might be negligible and the PTA would be underway. The government in country B might find that there is no change in political contribution from exporting producers.

In the intermediate case, the government of country A again finds itself losing political contribution from interest groups, but gain political popularity among consumers. In country B ,

the government gains more political contribution from the exporting producers that acquire higher profits from the PTA.

The decision whether both countries continue to pursue the trade agreement depends on the international negotiation between the government. GH95 assumes that the negotiation is settled following a Nash bargaining process. The equilibrium outcome whether the PTA would be endorsed or not thus can be reduced back to the equation (3). The PTA can be successfully negotiated only if (3) is positive, which means each government enjoy an increase in their “welfare”.

3.2. Product Exclusion that Saves PTA

Having expression (3) to be positive is a condition to ensure endorsement of the PTA. This condition leaves the government of both countries little room to negotiate. This situation might not appear all the time. GH95 characterizes the condition in which political-economy support is sufficient to pursue the PTA. It could only occur when potential trade under the PTA between the two countries is relatively “balance”. It means potential exporters, who would gain from the agreement, possess at least equal political contribution to the losing import competing producers.

The condition to endorse a PTA becomes more flexible if the countries are allowed to exclude particular products from the agreement. In that case, the government would find its objective function to be positive only for a set of products included in the agreement. The condition for pursuing the PTA now can be written as

$$\Delta G^j = \sum_{i \in E(T)} (a\Delta W_i^j + \Delta \pi_i^j) \geq 0 \quad \text{for } j = A, B \quad (4)$$

The first term on the right hand side of the equation measures the change in general welfare due to the inclusion of i into the FTA. While the second term represents the change in political contribution provided by the producers in industry i . The objective function is now calculated only over the included products, taking away $E(T)$, the set of excluded products in the PTA.

An important question is which products to be excluded. With permission to exclude products, each country needs to assess the effect of inclusion of every product into the agreement. If we

refer g_i^j as the change of government's objective function due to the inclusion of product i into the PTA, it can be written as

$$g_i^j = a\Delta W_i^j + \Delta\pi_i^j \quad \text{for } j = A, B \quad (5)$$

If there is no limitation on how many products can be excluded from the agreement, each government would simply exclude products with $\Delta g_i^j < 0$, and include those with negative effects to the objective function. If there is certain limitation on the number of products to be excluded, there would be a bargaining process between the governments over which product being included or excluded⁷. In GH95, the negotiation over product exclusions is solved using a Nash bargaining solution. The equilibrium agreement for every product i , is a reduced-form expression determined by a weighted average of the government's objective function. Assuming the weighted average takes form as linear function, condition for exclusion and inclusion of products can be written as

$$\begin{aligned} I_i^{*A} &= \omega^A g_i^A + \omega^B g_i^B \leq -\lambda \quad \text{when } I_i^A = 0 \quad \text{and} \\ I_i^{*A} &= \omega^A g_i^A + \omega^B g_i^B > -\lambda \quad \text{when } I_i^A = 1 \end{aligned} \quad (6)$$

Where ω^j is a weight associated to each country representing their bargaining power in the negotiation. The term $\lambda \geq 0$ refers to a multiplier associated to the constraint over product exclusions. Excluded products are represented by $I_i=0$ while $I_i=1$ refers to the products included in the PTA. Thus, if both negotiating countries can arrange the products orderly based on the weighted sum of their surplus for the associated product, they would seek to exclude products with the most negative values of the weighted sum.

Bargaining power between the two countries determine which products to be included in the agreement. GH95 describes bargaining power of participating countries to be affected positively by exogenous factors reflecting their bargaining strength. It is also negatively affected by the potential surplus received by the governments; the larger the gain from PTA, the more willing that government to compromise.

⁷ Agreements varies on what method to limit excluded products. Common practice is on setting certain fraction of trade volume, but number of products might also be considered.

3.3. Possible Empirical Strategy

Political-economy model of PTA from Grossman-Helpman (1995) sees product exclusion as a result of bargaining between countries considering what the government would “gain” from inclusion of a certain product. While GH (95) assumes linear function to represent Nash bargaining between two countries, the process can be also written in more general specification below.

$$I_i^{*A} = N \left[\omega^A, g_i^A(\Delta PC_i^A, a\Delta W_i^A), \omega^B, g_i^B(\Delta PC_i^B, a\Delta W_i^B) \right] \quad (7)$$

Where I_i^{*A} represents the result of Nash bargaining process, N , to decide whether a particular product i would be included or excluded in the PTA by country A. I_i^{*A} represents the likelihood of product i to be included in the PTA. As explained in previous section, this variable depends on the Nash bargaining weight for each country ω^j , and the change in governments’ surplus as a result of the inclusion of product i into PTA, g_i^j . Furthermore the governments’ surplus are shaped by the change in political contribution from industry i , PC_i^j , and the change in general welfare of the economy in each country W_i^j . This political contribution is related to profits received by the industry π_i^A , and how strong the interest group can influence governments’ decision, denoted by an indicator PI_i^A . Since the public welfare can be assumed to be affected by tariff revenue TR^j and consumer welfare C^j , the Nash bargaining result (7) can be elaborate further as written bellow.

$$I_i^{*A} = N \left[\Delta\pi_i^A, PI_i^A, \Delta C^A, \Delta TR^A, \Delta\pi_i^B, PI_i^B, \Delta C^B, \Delta TR^B \right] \quad (8)$$

In order to confront this model with schedule of product exclusions from PTAs in our sample, we need to specify data for each variable in (8). Unfortunately, we do not really have such pleasure, since most of the variables are either unobservable or not well recorded. We need to find certain data that highly related to the change of variable in the expression above. Again we look back to theoretical framework described in the last section with careful considerations on data availability.

One issue that needs to be considered to translate the theoretical framework into empirical specification, particularly with regard to data availability, is the level of analysis. Since we are trying to look at whether one product is included or excluded from a trade agreement, the

analysis is carried out in a highly disaggregated level. Product exclusions are usually defined for a very specific product categorization, commonly known as tariff line, which is usually classified in 6 – 10 digits HS code, comprising around 5000-10000 products. To explain pattern of product exclusions, we need to find data at similar level of aggregation.

Change in Profits and Consumer Welfare

The change in profits of the associated industry is one of the main aspects in understanding government's decision to include or exclude the product. The theoretical framework describes that change in profits of both import competing industry in country A and exporters from country B are explained by how far domestic price of a particular product in A potentially falls as a result of that product being included in the PTA. The drop of domestic price reduces profits previously enjoyed by the import competing industry in A ; bigger price reduction means bigger loss to the industry. For the exporters from B , change in domestic price also affects the potential profits received after the PTA in force. If the domestic price falls significantly, the exporters might see small change in their profits; but if domestic price falls only slightly, their profits increase substantially. The relation between price change and the Nash bargaining outcome from import competing producers and exporters is explained below.

$$\frac{\partial I_i^{*A}}{\partial(\Delta p_i^A)} = \frac{\partial I_i^{*A}}{\partial(\Delta \pi_i^j)} \frac{d(\Delta \pi_i^j)}{d(\Delta p_i^A)} > 0 \text{ since } \frac{\partial I_i^{*A}}{\partial(\Delta \pi_i^j)} > 0 \text{ and } \frac{d(\Delta \pi_i^j)}{d(\Delta p_i^A)} > 0 \quad (9)$$

The change in consumer welfare in A also follows changes in domestic price of the product. Significant price reduction increases consumption which also improves consumer welfare, while small change in price might not increase the consumer welfare substantially. The effect of price changes to consumer welfare depends also on elasticity of imports. While expression (8) includes changes of consumer welfare in exporting country B , we assume here that it does not change substantially as exporters might divert their exports to A after the FTA is in force, but not from domestic selling, therefore the effect to the bargaining outcome is negligible. The effect of domestic price change in the bargaining outcome through the change in consumer welfare is specified below.

$$\frac{\partial I_i^{*A}}{\partial(\Delta p_i^A)} = \frac{\partial I_i^{*A}}{\partial(\Delta C_i^j)} \frac{d(\Delta C_i^j)}{d(\Delta p_i^A)} < 0 \text{ since } \frac{\partial I_i^{*A}}{\partial(\Delta C_i^j)} > 0 \text{ and } \frac{d(\Delta C_i^j)}{d(\Delta p_i^A)} < 0 \quad (10)$$

The importance of domestic price decline in shaping profits and consumer welfare, which in turn determine the outcome of Nash bargaining, provides background to identify data required in the empirical work. Therefore it is worth looking into some characteristics of the potential price change.

The previous section on theoretical framework provides three illustrations on how the inclusion of a product into preferential trade agreement potentially change domestic price of the product. The first one is trade diversion case, in which domestic price remain the same or falls only slightly. The other two cases are trade creation cases, in which change in price is quite significant. The illustrations describe that the potential decline in domestic price after the PTA is in force depends on several factors.

One of the main factors is the capacity of trading partner B in exporting the product. Preferential treatment to exporters from B encourage them to divert their exports to A . Large export capacity to supply A 's market is likely to lead significant decline of domestic price in A . Small capacity of export, while also drives down the price, might be resulted in less significant price drop. Thus, export capacity of the partner country in supplying a particular product i is a good candidate for explaining pattern of product exclusions.

While export capacity influence the potential price drop from the exporters side, the decline in domestic price is also affected by the import demand in importing country. Holding export capacity of the partner constant, large imports reduce the effect of preferential treatment received by the exporters from country B ; leading to less price decline compare to small import demand. The size of import, thus, might serve as an explanatory factor for the incidence of product exclusions.

The effect of the above three factors to pattern of product exclusions can be summarized below, with X_i and M_i represents export capacity and import demand.

$$\begin{aligned} \frac{\partial I_i^{*A}}{\partial(X_i^B)} &= \frac{\partial I_i^{*A}}{\partial(\Delta p_i^A)} \frac{\partial(\Delta p_i^A)}{\partial(X_i^B)} < 0 \text{ since } \frac{\partial(\Delta p_i^A)}{\partial(X_i^B)} < 0, \\ \frac{\partial I_i^{*A}}{\partial(M_i^A)} &= \frac{\partial I_i^{*A}}{\partial(\Delta p_i^A)} \frac{\partial(\Delta p_i^A)}{\partial(M_i^A)} > 0 \text{ since } \frac{\partial(\Delta p_i^A)}{\partial(M_i^A)} > 0, \end{aligned} \tag{11}$$

As noted earlier in the theoretical framework, the above relationships have to be taken carefully as it might take different direction subject to the attitude of government towards interest groups and consumers. Those only apply when the governments concern more on political contribution from related industry while take less attention to consumer welfare. If the governments see consumer welfare higher, the relationships could be in different direction, since price decline increases consumer welfare; the bigger the price falling, the bigger support for inclusion of the product.

Political Influence and Other Factors

There are several other factors influencing the result of Nash bargaining process in (8). While the potential decline of domestic price explains the change in profits and consumer welfare, change in tariff revenue represents the foregone government A 's surplus related to the inability of charging tariff to goods imported from B . One way to describe this foregone tariff is to look at the size of imports coming from the partner countries. Large imports from B correspond to substantial foregone tariff revenue after the PTA takes place, resulting on larger reluctance from the government of country A to include the product in the agreement.

As explained in GH 95, the decision to include product in a trade agreement is also affected by political influence of the interest groups in the economy. This political influence determine to what extent related industry can persuade governments to include or exclude a particular product. Good measurements of political influence of industries and interest groups have been suggested by several authors in endogenous tariff literature both in theoretical and empirical work. Gawande and Li (2006) include a subjective indicator to represent whether industries are properly organized or not, while Gawande and Hoekman (2004) examine the structure of US tariff in agriculture products by looking at PAC contribution of the industry. While indicator reflecting how organized an industry is a good choice to measure how powerful it is in affecting trade policy, the construction of the indicator depends heavily on subjective judgment⁸. The practice of political contribution recording is only common in the United States, making it more difficult to look at political contribution directly in other countries.

⁸ In a study to examine bargaining power between EU, Japan and US affecting each other's tariff structure, Gawande and Li (2006) assume that all manufacturing industries in those countries are well organized, except for

Less direct indicators to political influence of interest groups using various industrial characteristics might serve as an alternative. Olarreaga and Soloaga (1998) propose a list of indicators build from several characteristics of industries, ranging from industry concentration index to labor union proxy, as well as policy indicators, such as tariffs, to capture the level of protection received by an industry. Unfortunately, these indicators demand sufficient information of industry characteristics related to the product examined, which is hardly available in a disaggregated level.

In this study, the political influence of interest groups in the decision to include or exclude a certain product into trade agreement is proxied by MFN tariff rate for that particular product. High MFN tariff rate indicates that associated industry producing the product maintain strong influence to government's policy and put effort in lobbying in favor of protection for the product, while low rate suggest that the industry either do not have strong influence or do not see the product require high protection. Besides indicating political influence, MFN tariff rate also represents policy variable in this study. By including a product into trade agreement, tariff rate applied to the product originated from partner country is lower than the MFN rate. Tariff reduction enjoyed by the partner country equals to the MFN rate, if the preferential tariff is zero after the PTA comes into force.

Another factor that has to be considered in econometric specification of GH model is country A 's trade position on product i . While the theoretical framework is deduced on the assumption that country A solely imports the product and its partner, country B , acts as an exporter, in reality it is easy to find that country A carries out both exports and imports of the same product. We deal with the problem by introducing trade balance of country A on the empirical specification. Product with positive trade balance is expected to be more likely to obtain preferential treatment.

The logic of thinking describe above leads us to represent factors affecting the outcome of Nash bargaining process in (8) as export capacity of exporting country B , import demand of country A , bilateral imports of A from B , and MFN tariff rate applied to the product. The

a few. While the reference studies of this paper does examined producers organizations, it is still difficult to come up with such conclusion.

feasible empirical specification used in this study, however, needs some adjustments related to several problems explained below and availability of data.

3.4. Empirical Specification

Expression (8) describes bargaining process that leads to support of inclusion of product i into the PTA. This support refers to an unobserved variables I_i^{*A} . Condition (6) translates the political-economy and international bargaining process into the observed exclusion/inclusion decision for a certain product, which is represented as value 0/1.

This condition has a parallel logic in econometric theorem known as latent variable approach to binary variable. In an empirical specification with I_i^{*A} as a latent variable linearly related to a set of factors x and error term u , we can express (8) and condition (6) as

$$\begin{aligned} I_i^{*A} &= x_i \beta_i + u_i \\ I_i^A &= 0 \quad \text{if } I_i^{*A} < 0 \\ I_i^A &= 1 \quad \text{if } I_i^{*A} \geq 0 \end{aligned}$$

It can be shown that

$$\Pr(I_i^A = 1|x) = \psi(I_i^{*A})$$

Where ψ refers to a particular cumulative distribution function.

By considering the empirical strategy explained above, a binary econometric specification can be proposed to empirically examine the inclusion (1) or exclusion (0) of a product in a PTA.

$$\begin{aligned} I_i^A &= \beta_0 + \beta_1 BALANCE_i^A + \beta_2 \ln IMP_i^A + \beta_3 \ln BIL_IMP_i^A + \beta_4 RCA_i^B \\ &+ \beta_5 MFN_i^A + Z\delta + u_i \end{aligned} \quad (9)$$

where u_i is disturbance term, and

- I_i^A is binary variable representing inclusion (1) or exclusion (0) of product i into the PTA in the sample.
- $BALANCE_i^A$ is country A 's total trade balance of product i , which is defined as

$$\left[\frac{EXP_i^A - IMP_i^A}{EXP_i^A + IMP_i^A} \right]. \text{ This variable tries to capture the effect of domestic output in the}$$

decision to include product I into the agreement. Higher value of *BALANCE* increase supports for inclusion of the product.

- IMP_i^A is country *A*'s total import value of product *i*. The data used in the econometric estimation comes from the period of negotiation for the associated PTA. From our discussion above it is expected that higher imports lead to higher support to inclusion of the product in the agreement.
- $BIL_IMP_i^A$ is country *A*'s bilateral import value of product *i*. The data used in the econometric estimation comes from the period of negotiation for the associated PTA. It is expected that higher bilateral imports reduce supports for inclusion into the agreement.
- RCA_i^B is an index of revealed comparative advantage from Balassa, representing country *B*'s capacity to export product *i*, defined as $RCA_i^B = \frac{EXP_i^B}{\sum_i EXP_i^B} / \frac{EXP_i^W}{\sum_i EXP_i^W}$, where EXP_i^B and EXP_i^W are export of product *i* from country *B* and the world respectively. The data is also extracted from the period of negotiation of the PTA. Higher RCA indicates less support of inclusion from country *A* point of view, as well as from country *B*' exporters.
- MFN_i^A refers to MFN tariff rate applied by country *A* for product *i* during the period of negotiation. It is expected that tariff rate is negatively correlated with the inclusion of the product.
- *Z* is a set of control variable affecting the decision to include or exclude product *i*. In this basic specification the control variables consists only dummy variables to represent pairs of country *A* and country *B*. Later, we include various variables on country level that affects the Nash bargaining process.

3.5. Translating Bargaining Power into the Empirical Model

A general concern over bilateral trade agreement, besides its effect to multilateral one, is the suspected unfair outcome due to imbalance bargaining power between negotiating parties. This concern becomes more crucial in the case of North-South bilateral negotiation. Our analysis of product exclusion can be extended to look at several factors that may affect bargaining and

negotiation process to include a product into PTA. Unlike various factors examined in the previous theoretical framework and basic econometric specification, which represents characteristics of a particular product, factors behind bargaining power attached to participating country characteristics.

As discussed previously, expression (8) describes bargaining process between two countries A and B that leads to support of inclusion of product i into the PTA. While factors that shape the process can be observed in product level, the outcome also depends on overall weighting ω^j for each country $j=A, B$. The weights determine how country's intention is accommodated in the negotiation. In a case where the weights of the countries are not equal, country with higher weight tends to have higher bargaining position and can pursue its intention to have the intended product included in the PTA. The basic empirical specification (9) takes the notion of bargaining weights by including pair dummy variables to capture effects of unobserved factors into the negotiation. This study explores various aspects that might be related to bargaining power between negotiating parties, and present them in the extended version of the empirical specification.

The source of bargaining weight in PTA negotiation can be look at in two categories: factors that attach to characteristics of the countries, and the ones that comes from dependency of a partner to each other and to the outcome of the agreement.

The economic size of countries involved in negotiation is one factor affecting bargaining power that shape decisions to include certain products in the agreement. Large economic size is associated with large domestic market. Countries with large domestic market depends less on international trade and tend to have higher bargaining power. Hence, we expect that importing country A with larger economic size tend to higher resistance to include products in the agreement. The effect of economic size to exporting country B is, however, ambiguous. While economic size increases its bargaining power, large domestic market might also reduce the incentive to push inclusion of products. In addition to economic size, the economy level of countries is likely to play role in negotiation of a PTA. It is captured by GDP percapita of the countries.

One important factor in preferential trade agreement is geographical proximity between the two countries involved. The notion of Regional Trade Agreements as a substitute for PTA

describes the tendency that PTAs are usually formed with nearby trading partners. The reason is because nearby countries tend to trade more with each other and therefore are likely to gain from free trade. While more trade between nearby countries increases the possibility of forming a PTA, bigger existing trade also means that import competing industries have to receive higher unfavourable effect of the PTA. It leads to higher resistance for the inclusion of import competing products into the agreement between nearby countries. The geographical aspect is captured by distance between two countries involved in the PTA. We expect that PTAs between distant countries to be more flexible in the inclusion of import competing products into the agreements.

In looking at factors behind bargaining outcome for product inclusion, we need to see dependence between partners to the outcome of trade agreement. Country that expects larger gain from the PTA tends to be more compromise in the inclusion of products. One way to see the importance of expected gain from the trade agreement is to look at how important the partner as export destination; the more important the partner is, the bigger the gain from the agreement (or the bigger loss if the agreement fails). This aspect is captured by the share of export from one country to another in each total exports. We expect that the more important importing country A to exporting country B , the more likely that import competing products in A to be excluded, since country B can expect bigger gain if the agreement prevail. On the other hand, import competing products in A would be more likely to be included if country B is an important market for A 's exports.

Considering the above discussion, a modified empirical specification below is proposed to explain the inclusion of products into trade agreement by taking into account various factors affecting negotiation and bargaining outcome between two countries A and B .

$$\begin{aligned}
I_i^A = & \beta_0 + \beta_1 BALANCE_i^A + \beta_2 \ln IMP_i^A + \beta_3 \ln BIL_IMP_i^A + \beta_4 RCA_i^B \\
& + \beta_5 MFN_i^A + \delta_1 \ln GDP^A + \delta_2 \ln GDP^B + \delta_3 \ln GDPCap^A \\
& + \delta_4 \ln GDPCap^B + \delta_5 \ln DISTANCE + \delta_6 Sh_EXP^{BA} + \delta_6 Sh_EXP^{AB} \quad (10) \\
& + \delta_7 FAST_TRACK + u_i
\end{aligned}$$

Where variables $BALANCE$, IMP , BIL_IMP , RCA , MFN and $ELAS$ follow description above. GDP^A and GDP^B describe GDP of two countries involved in the negotiation, while $GDPCap$

represents their GDP per capita. Variable Sh_EXP^{BA} correspond to the share of exports of country B to country A to its total exports, capturing the importance of market A to country B , and Sh_EXP^{AB} represents importance of B to A . Variable DISTANCE measures the distance between the two countries, while *FAST_TRACK* denotes the present of greater mandate to perform trade negotiation.

4. Econometric Results

4.1. Data for Explanatory Variables

Data for explanatory variables comes from various sources. Value of bilateral and total imports of reporting countries are collected from Comtrade database of UN Statistical division, which gathers yearly trade data at 6 digits HS classification. Data for RCA and trade balance calculation also comes from the same source. For our empirical purpose, the trade value is taken as three year average of exports and imports value during the period of negotiation for the countries involved in the agreements. Taking average is important considering we deal with highly disaggregated data which might suffer from yearly fluctuation.

MFN Tariff rates are collected from TRAINS database of UNCTAD. TRAINS database collects MFN tariff rate of each product according to original tariff lines classification, that comes under 6 to 10 digit HS classification, published by UN member countries for certain years. For the purpose of our estimation, the MFN tariff rate is calculated as simple average for each HS 6 digit product classification.

Data on GDP and GDP per capita is taken from World Development Indicator of the World Bank. Following the use of three years average of trade value, data on GDP and GDP per capita for each reporting and partner country is calculated as three years average for the period of negotiation. Data on distance between countries is taken from distance between the capital cities of two countries. In the case of European Union, the variable is represented by the distance between capital city of Germany, as the biggest trading country in Europe, and its partners.

Information on which reporting countries possess a mandate for trade negotiation equivalent to the Trade Promotion Authority of the US comes various news and articles. In our sample, only

United States hold “fast track” mandate that require the Congress to simply accept or reject trade agreements without having authority to change the outcome of negotiations. While the European Commission on Trade also possesses an equivalent authority, it was not until 2002 that the commission conducts trade negotiation under such mandate. The legal system of Japan and Canada does not allow provision of similar mandate from parliament, and need the parliaments of each country to ratify and accept the contents of trade agreements.

4.2. Main Results

In conducting econometric estimation, there is a problem related to dependent variable specification. In this model dependent variable takes value of 0/1. The application of OLS into this type of specification suffers from various problems, ranging from un-boundedness of dependent variable to heteroskedasticity. Binary response variable such as Logit and Probit regression provides solution to the related problems. With this type of regression, we can estimate the model using maximum likelihood techniques with logistic or normal distribution function as the cumulative distribution function.

The estimation of both specifications (9) and (10) is conducted using the Logit transformation regression. In examining various factors related to the decision for product inclusion into the PTAs, the estimation of specification (9) includes individual fixed effect for reporting and partner countries, while specification (10) is no longer capture individual fixed effect at the country level. To facilitate econometric estimation, there are several observations need to be removed from the dataset. The first is the observations with zero MFN tariff rate. Since the purpose of preferential trade negotiation is to provide tariff concession below MFN rates, there is no point to negotiate the inclusion of products having zero MFN rates into the agreement. While negotiation might try to get preferential treatment on non-tariff barriers, the constructed dataset only contains information about tariff reduction.

The second is tariff lines with specific or non-advalorem rates, which are incomparable and contain qualitative information. Fortunately, the TRAINS database provides the calculation ad-valorem equivalent of specific tariff rates for countries in the sample⁹. Nevertheless, the

⁹ The calculation of ad-valorem equivalent (AVE) is based on methodology developed by UNCTAD. Some AVEs are calculated very high. In order to reduce the possibility of having outlier in the dataset, I take away

calculation is incomplete, leaving a number of missing values to tariff rates that need to be taken away from the estimation. Finally some observations need to be drop from the sample following the unavailability of various data required for estimation. It leaves us with 99,421 observations in original tariff lines classification for the estimation using Logit model.

Table 5. Logit Estimation of Specification (9) and (10)

	Specification (9)		Specification (10)
	All Products	Agriculture	All Products
Constant	11.318*** (0.483)	3.393*** (0.316)	49.477*** (1.452)
Balance	0.295*** (0.026)	-0.560*** (0.035)	0.311*** (0.025)
ln_IMP	-0.045*** (0.007)	-0.087*** (0.008)	-0.036*** (0.007)
ln_BIL_IMP	0.008*** (0.001)	0.007*** (0.001)	0.006*** (0.001)
RCA	-0.119*** (0.006)	-0.017 (0.009)	-0.122*** (0.006)
MFN	-7.847*** (0.417)	-2.438*** (0.252)	-7.341*** (0.376)
ln_GDP ^A			-0.846*** (0.031)
ln_GDP ^B			-0.130*** (0.023)
ln_GDPCAP ^A			-1.085*** (0.065)
ln_GDPCAP ^B			-1.081*** (0.067)
ln_DISTANCE			1.011*** (0.060)
Sh_EXPA ^B			0.319*** (0.015)
Sh_EXPB ^A			-0.051*** (0.002)
FAST_TRACK			4.500*** (0.097)
N	93607	19750	99421
Adj. Count R²	0.167	0.444	0.150
R² (Mc Fadden)	0.275	0.273	0.277

Note: *** Significant at 1% level of significance, ** 5% level of significance. Numbers inside parenthesis represent standard error. Estimations for specification (9) include individual effect of reporter and partners. The large number of within group observations allows us to conduct the estimation by introducing dummy variables, which is computationally more efficient than having conditional logistic regression for a large dataset. Different number of observations for specification (9) and (10) is due to the elimination of PTA Canada-US from regression as a result of no product exclusion in the agreement.

observations with high calculated applying a filter of mean + 2 standard deviation calculated for product groups in HS 4 digits for each reporting country

Table 5 presents the results of Logit estimation for both specification (9) and (10), conducted in the original tariff lines classification. In this estimation, dependent variable is the inclusion of product into agreements (with value 1) or excluded (with value 0). The estimation is conducted for all products and for agricultural products only to see whether such products exhibit different pattern from other products.

Results of the estimation for all products show that both MFN tariff of reporting countries and RCA of partner countries significantly explain the choice of inclusion or exclusion of a product into PTAs. Coefficients of both variables also follow the prediction on theoretical framework. There are several other variables that yield significant coefficients, but mostly have different signs than the expected. Among others is the import value of a particular product, as a proxy of import demand, which does not correlate positively to the decision to include the product. Bilateral import value does not seem to follow the hypothesis either, although the variable seems to be significant. We discuss more on country level variables below to see their relevance with the bargaining power of the countries involved. It appears that those variables are significant and display the expected sign.

The estimation on agriculture products as a sample reveals somewhat different pattern of product exclusion. The only variable that follows the hypothesis is the level of MFN tariff for the product, which is negatively correlated with the decision. Variable that represent the support of product inclusion from the partner countries, namely variable RCA, appear to be with the wrong sign but not significant. The result for agriculture products might suggest that the decision to include a particular agriculture product is dominated by the reporter country preference, rather than as a result of negotiation between two countries involved.

In conducting the estimation above, we pay more attention to the fact that the dependent variable, product exclusions, are coded in a highly disaggregated level of original tariff lines. Unfortunately, data for the related explanatory variables is only available in less disaggregated classification. While tariff lines commonly come as 8 – 10 digits HS code, the available data for most of the regressors, such as export and imports, is limited to 6 digits HS level. This might affect the estimation significantly considering the dependent variable only takes two extreme values 0 or 1.

An alternative is to conduct the analysis in more aggregated level of HS 6 digits. Since the outcome variable is a binary variable, it is problematic to do the aggregation as it leads to non binary results. We can make an arbitrary assumption by declaring an HS 6 digits product to be excluded if there is at least one tariff line (less aggregated classification) comes up as excluded product. This strategy risks the analysis to be bias towards excluded products¹⁰.

This paper takes a different approach by looking at proportion of included product as the dependent variable¹¹. Thus, instead of taking 0 or 1, the I_i^A takes value between 0, which means there is no original tariff line of 8-10 digit HS appears to be included in PTA for related 6 digit classification, and 1, which means the whole tariff lines in the associated HS 6 digits being included in the agreement.

With a fractional dependent variable, binary-choice techniques might not be appropriate for estimation of the model. Papke and Wooldridge (1996) suggest the application of quasi maximum likelihood estimation (QMLE) method for a specific binary distribution. While this estimation is non-linear in nature and might be solved by NLS estimation, a special case of the estimation, when the distribution function is the logistic function, can be carried out in the Generalized Linear Model framework using binomial distribution as a link function. An important drawback of this GLM method, namely inconsistent estimator of standard error, can be overcome by calculation of robust standard error.

Our main empirical work for specification (9) and (10) is, therefore, carried out by applying the QMLE method. The estimations are carried out at the level HS 6 digits level of product classification by aggregating the dependent variable and transforming it into fractional data, leaving us with 50,177 observations to estimate the pattern of product exclusions based the hypothesis developed above.

¹⁰ As an illustration, assume that one product under HS 6 digit classification contains 10 more disaggregated tariff lines. With this strategy, if there is one tariff line excluded from the agreement, the value of I_i^A is 0, regardless how many other tariff lines under the same classification are parts of the agreement.

¹¹ Using this alternative strategy, the value of I_i^A for the same 6 digits HS classification in the above example is 0.9 instead of 0.

Table 6. Fractional Logit (QLME) Estimation of Specification (9) and (10)

	Specification (9)		Specification (10)	
	All Products	Agriculture	All Products	Agriculture
Constant	10.700*** (0.640)	3.326*** (0.405)	57.701*** (2.258)	48.076*** (2.501)
Balance	0.608*** (0.038)	-0.338*** (0.059)	0.596*** (0.038)	-0.331*** (0.058)
ln_IMP	0.057*** (0.011)	-0.045*** (0.013)	0.057*** (0.011)	-0.042*** (0.012)
ln_BIL_IMP	0.010*** (0.002)	0.008*** (0.002)	0.009*** (0.002)	0.008*** (0.002)
RCA	-0.092*** (0.012)	0.007 (0.017)	-0.093*** (0.011)	-0.001 (0.017)
MFN	-7.173*** (0.509)	-2.422*** (0.241)	-7.233*** (0.484)	-2.472*** (0.239)
ln_GDP ^A			-0.770*** (0.049)	-0.652*** (0.064)
ln_GDP ^B			-0.454*** (0.041)	-0.441*** (0.053)
ln_GDPCAP ^A			-1.477*** (0.117)	-1.503*** (0.174)
ln_GDPCAP ^B			-0.766*** (0.119)	-0.683*** (0.150)
ln_DISTANCE			0.918*** (0.082)	0.763*** (0.136)
Sh_EXPA ^B			0.319*** (0.020)	0.297*** (0.036)
Sh_EXPB ^A			-0.062*** (0.004)	-0.047*** (0.004)
FAST_TRACK			5.403*** (0.260)	5.257*** (0.219)
N	50177	7316	50177	7316
R² (Mc Fadden)	0.283	0.086	0.287	0.090

Note: *** Significant at 1% level of significance, ** 5% level of significance. Numbers inside parenthesis represent standard error. Estimations for specification (9) include individual effect of reporter and partners. Mc Fadden R² is calculated as a ratio of fully modelled and constant-only model log-likelihood, adjusted by the number of regressors.

Table 6 present the results of estimations using the QMLE/GLM method for product exclusions in our sample of PTAs with regards to all products and agriculture products only. Similar to the estimation using Logit regression, all coefficients appear to be significant. MFN tariff of reporting countries and RCA of partner countries again seem to be negatively correlated with the choice to include a product in PTAs, with a significant coefficient of estimation. Other variables also follow the predicted sign from the hypothesis above, except for the value of bilateral imports from the partners of PTAs.

For agriculture product, similar results can be observed from the estimation using this fractional Logit approach. Most coefficients of variables, except for MFN tariff, show different sign from the expected results. Coefficient of RCA that represents the partners' pressure toward the inclusion of product do not seem to be significantly correlated with the decision.

4.3. Interpretation of Coefficients

Theoretical framework based on Grossman-Helpman model describes product inclusion in a PTA is an outcome of bargaining process between the two participating countries considering a surplus or loss in government objective function. Estimation of specification (9) results in significant coefficient for various factors related to the two countries in explaining the pattern of product inclusion. It is interesting to see which factors play more important role in explaining an inclusion of a product by looking at the magnitude of coefficient for each relevant variable rather than only focus on the sign of the coefficients.

Unfortunately, non linearity nature of QLME technique used in the estimation does not allow direct interpretation to the coefficients. It leads to difficulties in comparing the magnitude of each coefficient. One common technique to interpret the non-linear estimators is by presenting it as marginal effects of estimator k at specific value of independent variable. The marginal or partial effects measure the change in dependent variable due to change in independent variable, calculated at certain values of independent variables. It is commonly defined as:

$$\frac{\partial E(I^A | \mathbf{x})}{\partial x_k} = g(\mathbf{x}^o \beta) \beta_k$$

Where $g(z)$ is the link function, in our estimation to be logistic function $\frac{\exp(z)}{1 + \exp(z)}$, and \mathbf{x}^o is specific values of independent variable. Table 5 gives illustration on marginal effect of selected coefficients from QMLE estimation, evaluated for all reporting countries in the sample, while keeping other independent variables at their mean (See Appendix A for mean point used in the evaluation of marginal effects).

One important variable is RCA index, which measure the capacity of partner countries to exporting the product into reporting countries market. Each point of increase in RCA index of partner countries reduces the possibility of having the product into schedule of tariff

elimination by 0.3%. Roughly speaking, the proportion of included products can also be interpreted as the probability of a product to be included in an agreement. Another important factor in explaining the inclusion of products is the imports value of the reporting country. Products with larger import value are more likely to be included. In our estimation the effect is quite substantial; probability of a product to be included in an agreement increases by 0.2% for a 1% increase in imports value from its average.

Table 7. Marginal Effects of Fractional Logit Estimation and OLS

	OLS	Marginal Effects (QMLE)	
	(10)	(9)	(10)
Balance	0.030*** (0.002)	0.022*** (0.005)	0.018*** (0.002)
ln_IMP	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.000)
ln_BIL_IMP	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
RCA	-0.005*** (0.001)	-0.003*** (0.001)	-0.003*** (0.000)
MFN	-0.209*** (0.032)	-0.259*** (0.065)	-0.217*** (0.027)
ln_GDP ^A	-0.029*** (0.002)		-0.023*** (0.003)
ln_GDP ^B	-0.008*** (0.002)		-0.014*** (0.002)
ln_GDPCAP ^A	-0.050*** (0.008)		-0.044*** (0.006)
ln_GDPCAP ^B	0.002 (0.001)		-0.023*** (0.005)
ln_DISTANCE	0.001 (0.002)		0.028*** (0.004)
Sh_EXPA ^B	0.001*** (0.000)		0.010*** (0.001)
Sh_EXPB ^A	-0.001*** (0.000)		-0.002*** (0.000)
FAST_TRACK	0.133*** (0.003)		0.031*** (0.004)
N	50177		
R²	0.195		

Note: *** Significant at 1% level of significance, ** 5% level of significance. Numbers inside parenthesis represent standard error. Marginal effect is evaluated at the mean value of all variables. OLS estimation is presented as a comparison.

Both effects in the estimation are in line with theoretical framework from Grossman-Helpman (1995). GH95 predicts that products that potentially generate “trade creation” after the implementation of PTA would be likely to be excluded. Trade creation is likely to occur when export capacity of partner country is large and reporting country’s imports is small. In this situation, preferential tariff concessions would reduce domestic price, which is unfavourable to political support received by the reporting country’s government, leading to the exclusion of products. As mentioned in the previous section, this situation happens only when the governments place more emphasize on political support from import competing industries than from consumers. Results of our estimations indicate such case.

While export capacity of partner countries and imports value of reporting countries have significant effect to decision towards the exclusion of products into trade agreements, MFN tariff rate applied to the product appears to dominantly affect the decision. An increase of tariff rate by one percentage point reduces the proportion of included products at 6 digit HS classification by 0.25%. The effect of MFN tariff seems to be dominant in determining whether a product to be excluded from an agreement. Since this tariff policy is determined “unilaterally” by reporting countries even before the negotiation takes place, we can see that product exclusions are in some part determined only by the reporting countries. Moreover, the unilateral decisions appear to be quite major in constructing pattern of product exclusions.

4.4. Bargaining Power in Trade Negotiation

A general concern over bilateral trade agreement, besides its effect to multilateral one, is unfair outcome of negotiation. This concern becomes more crucial in the case of North-South bilateral negotiation. Econometric estimations in this study attempts to provide finding on this concern by looking at effects of various country characteristics on pattern of product exclusion.

Descriptive analysis on pattern of product exclusions in previous section reveals that the list of products exempted from tariff concession of reporting countries varies between one agreement to another. Results of the estimation confirm such finding. All country characteristics, both for reporting and partner country, appear to significantly explain the pattern of product exclusion. This imply that the same product, with similar features of various factors described in specification (9), from different partner countries receive different preferential treatment from a reporting country according to each partner country’s characteristics.

One of the main factors affecting the pattern of product exclusion is the size of economy. As discussed in previous section, it is expected that reporting countries with large economic size tend to exclude more. Our estimation follows the proposition as the coefficient for GDP or reporting country A is negative. Big countries have larger market, which increase their bargaining power in the negotiation. The level of economy also plays significant role in explaining the pattern of product exclusion in the sample. The same with size of the economy, the richer country tends to be more averse in providing tariff concession in trade agreement.

An interesting finding is exhibited by the coefficient of partner country's economic size. A descriptive look to our dataset roughly indicate that agreements involving developing countries as partners tend receive less excluded products than if the developed country partners. The estimation supports such indication by presenting negative coefficient for economic size of partner, GDP^B . A product from a partner with larger economic size is less likely to be included in preferential agreement. The estimated coefficient for economic level of the partner, $GDP\text{Cap}^B$, also shows that richer partners are likely to receive more excluded products in their agreements. While this finding has to be taken in with care, it shows that preferential trade agreements with developing countries might get more flexibility in terms of exclusions from tariff elimination schedule.

Distance between the two countries also affects the decision towards inclusion or exclusion of a product. The estimation reveals that reporting country become more flexible to include products in an agreement with distant partners rather than closer neighbours. It might be related to higher possibility of having "trade creation" as a result of preferential tariff provision.

Other two variables in specification (10), namely SH_EXP^{AB} and SH_EXP^{BA} , measure how important one country to another for their market destination, and how important the agreement to prevail for each country instead of to fail. The econometric estimation indicates that the more important reporting country A to the partner country B , represented by SH_EXP^{BA} , negatively correspond to the probability of products to be included. It is fit the intuition that the more important reporting country to the partner country the more compromise its position during negotiation. Moreover, it also indicates that partner country tends to accept proposal of exclusion from reporting country in order to save the agreement due to higher potential gains it might receive. On the other hand, reporting country also does not hesitant to

provide more concession if it is in negotiation with an important partner as shown by positive coefficient for the SH_EXP^{AB} .

The last factor in specification (10), variable $FAST_TRACK$ captures the domestic political institution of reporting countries dealing with preferential trade negotiation. Greater mandate that allow governments to negotiate the outcome, while at the same time limiting domestic political influence during the negotiation, increases the likelihood of products being in the list of tariff elimination. This type of mandate is known as Trade Promotion Authority (TPA) in the United States or part of Article 133 in Nice Treaty of European Union. Our estimation confirms that such mandate allows more inclusion of products into trade agreements.

Going back to the concern over uneven bargaining power in preferential trade agreement, our econometric analysis reveals that the concern is not really groundless. The country characteristics of negotiating parties are relevant in the bargaining process. Bigger and richer reporting country, for example, are more influential to exclude products from its tariff concessions. However, partner country's characteristics also play important role in the decision. Interestingly, the estimation result presents different implication than the common perception towards partner country's bargaining position. Instead of having richer and bigger partner on a better position in negotiation, the econometric analysis implies that smaller country is likely to get more preferential treatment from reporting country. Besides, the negotiation outcome is also related to how important one country to another and how it perceives the gain from trade agreement. These aspects might not depend on whether the participating countries have large or small economies, but rather on the intensity of economic relation between them.

5. Conclusion and Discussion

One common feature in Preferential Trade Agreement is the presence of some products that are excluded from provision of tariff concessions. This study is an attempt to provide more understanding on the pattern of product exclusion in PTAs. Having analyzed the pattern of product exclusion in a sample of 15 trade agreements involving four largest economies with their main partner, there are several aspects worth to discuss with regards to our analysis and its implication.

First is the pattern of excluded products which is a small part of an agreement. The presence of products excluded from tariff concessions is limited to only less than 15% of tariff lines discussed in a negotiation. Moreover, these excluded products are concentrated in several product groups, such as agriculture and food products, although some are observed in other industries. However, our analysis defines excluded products as temporary and permanent exclusions. It means we only look at products that do not receive preferential tariff rate at the first year of implementation of a PTA. If more strict definition is used, such as defining excluded product as the ones remain subject to tariff, although less than MFN rate, the number of products in exclusion list of our sample would be much higher.

Second is the finding that products exclusions vary from one agreement to another. Despite general opinion about trade agreements that have to follow a “template” prepared even before negotiation takes place, a quick look into dataset in our sample reveals different patterns of excluded products from each reporting country. This finding suggests that trade agreements are products of negotiating process between the two countries involved, in addition to the presence of agreement “template”. Econometric work in this study analyzes various factors determining the pattern of product exclusions in the sample, using a theoretical framework proposed by Grossman-Helpman (1995).

Several factors are significantly related to the pattern of product exclusions, such as export capacity of partner countries and import demand of the reporting countries. The econometric results confirm Grossman-Helpman (1995) proposition that products which potentially generate “trade creation” effect after the agreement put in force, are more likely to be in the exclusion list. Trade creation effect would reduce domestic price of the product significantly and increase opposition of import competing industries, while at the same time lessen incentive for exporters to push for tariff elimination. Moreover, the econometric estimations find several country characteristics that are significantly correlated to exclusions of products from an agreement. All these factors are related to the bargaining position of both countries involved in negotiation.

However, the empirical exercise also find that product exclusion is correlated with the regime of trade protection; the more protected an industry or the associated products, the more likely it is excluded in the trade agreement. In fact, this factor, which is unilaterally determined by the

reporting countries, turn out to be a dominant one in determining whether a product to be included or excluded in an agreement.

The significance of those two types of factors, the ones that are related to bargaining position of partner countries and the one solely determined by reporting countries, leads to a conclusion that product exclusions in preferential trade agreements are outcome of negotiation process, but heavily influenced by unilateral decision of the reporting countries.

This study is conducted by looking at a limited number of trade agreements, particularly the ones between developed and developing countries, although there are some trade agreements among developed countries in the sample. Small number of agreements in the sample might give bias results on the examination of bargaining outcome in the study. Further extension of bigger sample covering more agreements among developed and also developing countries might provide better picture on the pattern of product exclusions. Future study might also explore the phasing out feature of tariff elimination to obtain better understanding on discriminatory nature of preferential trade agreement.

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Appendix

A. Descriptive Statistics of the Data

	Obs	Mean	Std. Dev.	Min	Max
BILATERAL	51028	-0.161	0.620	-1.000	1.000
IMP	51028	127,428	1,746,634	0	189,000,000
BIL_IMP	51028	4,361	82,492	0	10,100,000
RCA	51028	0.903	1.929	0.000	15.854
MFN	50594	1.084	0.190	1.000	7.353
ELAS	51025	-14.393	56.740	-372.246	0.000