

CTEI Working Papers

21st Century Regionalism and Production Sharing Practice^a

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Abstract

One important feature in the more globalized and integrated world today is the proliferation of regional trade agreements (RTAs), which started to grow rapidly in the early 1990s. Not only in terms of numbers, the formation of RTAs during the last two decades also introduced many new features to traditional concept trade agreements beyond simple elimination of trade barriers, such as investment protection, competition policy and IPR protection. One hypothesis on this new development is the emergence of global production sharing practice that has swiped international manufacturing production management for more than three decades. This paper examines the linkage between the new production practice and the wider coverage in the 21st century RTAs.

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21st Century Regionalism and Production Sharing Practice

1 Introduction

One important feature in the more globalized and integrated world today is the proliferation of regional trade agreements (RTAs). The number of RTAs in force has rapidly increased during the last two decades. According to WTO data, there are over 300 regional trade agreements, up from less than a hundred in the early 1990s. Today, more than half of world trade is governed by at least one RTAs (WTO 2011).

Beyond sheer numbers, the development of RTAs during the last two decades has involved many new features, what Lawrence (1996) called “deeper” provisions, thus extending the traditional concept of RTAs. This includes many policy areas related to commercial regulatory areas that go beyond the conventional market-access goal of traditional trade agreements.

Horn et al (2010) studies 28 agreements involving EU and US and list 52 policy areas that appeared in at least one agreement. These include commitments on investment protection and liberalization, adoption of best practice of competition policies both for private and state-owned entities, protection of intellectual property rights, and liberalization of government procurement. These, along with the deepening of commitments in facilitating trade, e.g. custom facilitation, adoption of more flexible rules of origin, and also liberalization of services, have become the primary focus of RTA negotiations. Implementation of those measures needs some kinds of legal incorporation into domestic regulatory framework and involvement behind border policy reforms. However, not all new policy areas in RTAs seem to be aimed at shaping the trade and investment environment.¹ While both theoretical and empirical literature on determinants of RTA is quite large, the existing literature on the new features of trade agreements is still limited².

This paper attempts to shed light on why deeper provisions are so common in 21st century trade agreements. There are two main contributions of this study. First, it

¹ Many of those new provisions have little commercial weight and seem more related to socio-political issues. Any attempt to examine economic provisions in RTAs needs to pay attention on this issue.

² More descriptive discussions on this issue are, however, quite abundant. WTO (2011), for instance provides a thorough survey on the contents of these RTAs. Essays in Chauffour and Maur (2011) give comprehensive discussion on several important policy areas in RTAs.

offers more systematic methods in classifying trade agreements based on provisions of commitments. Some statistical methods are utilized to get better insight and more meaningful way of classification. The second is to econometrically identify the determinants and driving factors behind it. The categorization discussed in the earlier part serves as a dependent variable in the econometric work.

Some driving factors may be related to political economy motives, both as an instrument in international geopolitical relation and as a commitment device for regulatory reforms³. However, economic and trade-related aspects remain to be major factors behind the inclusion of new behind-border issues in current RTA negotiations. Even some political-economy motives, e.g. commitment devices and the delay of multilateral talks, can also be seen as the extension of the economic motives.

One of the important economic motivations may come from the recent development of global trade and production practice, which is known in many terms such as international production network, international production sharing, fragmentation of production or the second unbundling. As Baldwin (2011) points out, the second great unbundling of production has defined the current production model where trade in goods is intertwined with international investment in production bases, long term business relationships, together with international service provisions⁴. With this new business model, firms can utilize comparative advantages by slicing-up production at finer stages and placing them in different location according to the intensity and the abundance of factors of production.

However, the heavy reliance on cross-border economic activities creates new kind of problems rarely found in traditional production process. Business deals involving two or more parties originated from different countries with different legal background increase business risks and uncertainty. Long term business relationships based on bilateral bargaining might be subjected to various coordination and hold-up problems. Such problems can be addressed by an agreement on a set of internationally accepted

³ Mansfield and Pevehouse (2000), for example, examines military conflict and RTAs, and found evidence that membership reduces possibility of conflicts. Vicard (2011) is the only study in our knowledge that extends the examination of geopolitical situation with the “depth” of trade agreement, although the concept of depth is based on traditional distinction between single market and partial scope agreement, rather than coverage of issues and policy areas.

⁴ The first great unbundling took place as a result of lower transport cost that allows international dispersion of production in accordance to comparative advantage.

rules and adoption of international best practice to the domestic regulatory framework.

Here is where new features of RTAs play an important role. The 21st century regionalism, with its behind-border and deeper commitments, provides deeper disciplines of international trade and production in the 21st century trade to ensure efficient practice of international production sharing.

Given this reasoning, the main axis of investigation in this paper is an attempt to look at the linkage between the new international production sharing practice and the deepening of commitments in RTAs. It is related to the literature of determinants of RTAs, notably from Baier and Bergstrand (2005) that examines various economic variables that shape the decision of trading partners in establishing preferential trade agreement. This paper extends the analysis by examining the patterns of deeper commitments beyond simple tariff reduction and trade liberalization.

While empirical literature of deeper commitments in RTA is still limited, some efforts have been initiated to look at the issue in more systematic way. Among others are Horn et al (2010) that, whilst does not provide empirical testing, offers organized framework to assess the deepening of commitments in RTA. WTO World Trade Report (2011) also presents comprehensive outlook on the issue, as well as providing dataset of deeper commitments. Orefice and Rocha (2011) look at the similar issue faced by this study, which is the linkage between deeper commitments in RTAs and the production network.

The rest of the paper proceeds as follows. In the next section, we describe possible linkages between deeper integration in RTA and the emergence of new production sharing model. Here, we look at how new production practice requires certain conditions that can be provided by various new commitments in trade agreement. The third section explores a new classification of trade agreement by accounting for commitments commonly present in new type of RTAs, before looking at some empirical evidences on the linkage between deeper commitment and production network in the fourth section. The last section discusses the finding and presents our concluding remarks.

2 Deeper Integration in RTAs and Production Networks

This section discusses the linkage between deeper commitments and provisions commonly found in recent RTAs and the emergence of international production sharing practice. In framing the argument we examine several important features of the new production practice. We then discuss some issues related to those features and shows how the commitments in RTAs are attempts to address the problems.

2.1 Development of International Production Networks

The business practice of sourcing intermediate inputs internationally is hardly new. International trade in parts and components could be observed even in the early 1960s, although it mostly happened between developed countries. However, the last three decades have witnessed major escalation of such trade. This increasing trend is actually part of the bigger development of global production network where production takes place in different but interconnected locations in order to fully utilize comparative advantages. Baldwin (2006) describes this practice as the second great unbundling due to its characteristics of opening-up “the black-boxes” of production entity, which are previously organized within a single firm located in one site or in close proximity.

Several factors can be attributed to the raise of such practice. Advances in telecommunication reduced communication costs and this, in addition to low-cost transportation, allowed firms to offshore tasks to distant locations. The early literature, such as Jones and Kierzkowski (1990), calls these as the reduction in service costs related to trade and production. Baldwin (2006) emphasizes efficient telecommunication and long distance information sharing to make coordination cost of remote activities become easier and cheaper. Innovation on production methods and management also create the type of organization that is much easier to coordinate.

According to Baldwin (2011), the internationalisation of production, or second great unbundling as he calls it, is composed of two major elements: (i) doing business and production abroad and (ii) connecting international production facilities. Slicing-up production process into several stages and placing them in different countries require firms to conduct international business activities. This is normally performed through the establishment of overseas subsidiary or international outsourcing through foreign investment and international business contract with transfer of production technology. Cross-border investments on production facilities, as well as overseas application of

technical and managerial know-how, by multinational companies have become the major aspects of this 21st century trade.

The dispersed production bases remain disconnected without the activities to bond them together. Organizational management and coordination, as well as cross-border movement of goods, in particular parts and components, of people and ideas, become the ties to link those separated production activities and to form the global production network. Lower cost and high quality of communication infrastructure and services, again, has allowed such interconnection to work smoothly and efficiently.

Baldwin (2011) points-out those two elements as the principal feature of 21st century trade, which is indicated by the intertwining of international trade, cross-border investment, and intensive use of infrastructure services. This trade-investment-service nexus has brought the complexity of production, flow of knowledge and flows of goods, previously took place within proximity, to the global venue in a much bigger scale. The internationalization of production activities also introduces many problems that were unknown in the traditional model of production. We discuss this aspect further below to see the link between deeper commitments in RTAs and the development of such production network.

3 A Framework Linking International Production Sharing and RTAs

The conceptual framework we use in approaching the empirical work separates the main need for beyond-tariff-reduction provisions as those related to: (i) doing business and production abroad, and (ii) connecting international production facilities.

3.1 Problems in Doing Business Abroad

The establishment of overseas production bases or the signing of long term contract with foreign supplier increases exposure of multinational firms to unfavourable legal, political and regulatory arrangement of foreign countries' governments, as well as harmful business conducts from private entities. Such practices can be described as behind-border barriers that may hamper the 21st century trade and hold back the development of global production network.

One problem related to the overseas activities is the lack of protection to investors' assets. Multinational companies feel the need of protection of their assets against the financial damages from political and legal risks that might occur in the host countries.

The risks affect not only financial and physical assets but also intellectual properties. Firms subcontracting some works to suppliers in other countries may require sharing their proprietary knowledge, such as trademarks, industrial designs and patents. The risk of losing valuable assets increases as the practice become substantial in production process of the firms.

Bilateral investment treaties (BITs) that have been around for more than a half century between developed and developing countries are actually aimed to provide protection against political and legal risks. In many recent RTAs, such protection has been incorporated into investment provision of the trade agreements. Agreement on intellectual property assets protection is also now become a common feature of trade agreements.

Harm to foreign corporate interests can also come from anti-competitive behaviour by other players in the host nation. In a country with weak competition, private sector barriers such as collusive agreements or restrictive practices in distribution can replace government-erected trade barriers. Long term, non-competing and exclusivity nature of the related organizational relations may create vertical market power of a final producer by restricting access to intermediate inputs. Moreover, the monopoly practice of state-owned enterprises in many countries can exacerbate unfavourable business situation to the firms operating in foreign countries. Introduction of competition rules and disciplines to deal with such abusive behaviours could minimize the problems. Competition policy and state owned enterprises provisions in current RTAs are intended to provide protection for firms against such anti-competitive problems.

Behind border barriers can also come in the form of behind border market access restrictions. While, for instance, there is no barrier for foreign firms to invest in a country, they may only open up subsidiaries and operate in some regions and on limited activities. Discriminatory treatment towards foreign firms, such as higher investment requirements or stricter regulations, can also increase the cost of doing business internationally and affect the performance of production network. Provision of services trade in RTAs normally deals with behind-border market access restrictions that often directed to services sector.

Here we can see that some provisions in RTAs are in place to address problems in conducting the operation and production activities overseas. Several of them provide protection against unfavourable business, political and regulatory situation, while few others deal with behind border market access restrictions and discriminatory treatment. Others provisions of current RTAs deal with the second element of 21st century trade, namely the international linkages of those production and business units.

3.2 Problems in Connecting International Production Facilities

Placing production in several countries becomes economical when the cost of moving all aspects of production is lower than the benefits from cost-saving in production. Timely and economical movement of goods, capital, knowledge and people become one of the principal requirements of the 21st century trade.

In response to such needs, developing countries have aligned their trade policy to allow greater market access for trade in parts and components. In early 1980s, countries started unilateral tariff cuts to attract FDI indicating tight competition for being alternative manufacturing sites of MNCs⁵. In many countries the cuts were also complemented by other policies to promote export-oriented products and components, such as duty-drawback policy and the establishment of export-processing zones. As a result, the applied MFN tariff rates of many developing countries had declined significantly in early 1980s to early 1990s. Southeast Asian countries, for instance, reduced average MFN tariff in parts and components from over 20% to around 14% by early 1990s.

However, faster and cheaper trade involves more than just tariff cuts, such as efforts for applying straightforward customs and trade procedures, simplifying standards and conformances, and removal of non-tariff barriers. Some of these efforts are less effective as unilateral trade liberalization policy. Standards and conformances that accommodate production sharing practice call for the consent of trading partners or other countries in the production network. Simpler customs and trade procedures have to be harmonized to get more effective results. All these need somewhat to take place as commitments at bilateral, regional or multilateral level.

⁵ Vezina (2010) provides empirical evidence on the contagion pattern of unilateral tariff cuts in East Asia from 1986-2006. It turns out that the moves were in response to the race in attracting investments from Japanese manufacturers.

Moreover, unilateral tariff cut is an unfinished business. While tariffs were relatively low in the mid 1990s, the results of Uruguay Round placed the bound tariff rate of developing countries much higher than the applied rate. There was a high degree of uncertainty as the countries could backtrack from their liberalization path and increase the tariffs up to the maximum allowable rate. This could jeopardize further development of international production network.

Some policy areas discussed in recent RTAs provide just those requirements. Some provisions, such as customs procedures and trade facilitation, aim to create simpler and faster trade procedures. Agreements on standard and conformance, as well as agreements on technical barriers, try to increase harmonization of such policies. Agreements of tariff and non-tariff barriers provide assurance for maintaining the level of existing liberalization. Other provisions on capital and labor movement in RTAs extend the facilitation to more than just trade in goods, as required by the 21st century trade.

3.3 RTA as a Solution

Based on this discussion of needed disciplines, it seems that many provisions in current trade agreements fit nicely into this fourfold classifications of disciplines: disciplines on behind-border problems related to 1) 'guarantees' (protection against unfavourable situations and business conduct) and 2) behind border 'market access' (assurances of being able to operate business units and sell to customers within the nation); and with regard to connecting international business units, provisions that provide 3) greater market access (from reduction of tariff and non-tariff barriers, and 4) trade facilitation (ensuring simpler, reliable, and more harmonized procedures on trade and movement of factors of production).

While many of new provisions in RTAs might be set to address the problems faced by 21st century trade, not all of them possess relevant commercial weight. Of the 52 policy areas discussed in Horn et al (2010), only some of them affect the global production network as described above. The next section looks at the issue in more detail in order to come-up with a core group of provisions in RTAs.

4 The Depth of a RTA: An Exploratory Analysis

4.1 Typology of RTA

Traditional way to classify regional trade agreement is to see how far the agreement affects members' and non-members trade flow. At the lowest level, trade integration might take form as partial trade agreements, in which members agree to eliminate barriers of trade from other member countries for a certain group of products or industries. The agreement might cover all or substantial amount of traded goods; this is known as a free trade agreement (FTA), where trade is liberalized among member countries, but each member maintains its own trade regime.

Higher level of integration requires members to adopt common trade regime to the rest of the world in addition to internal trade liberalization among them. This type of agreement is known as custom union (CU). Deeper level of integration is achieved through the implementation of single market (SM) by allowing free movements of economic factors, such as labour and capital, and also moving toward harmonization of various trade-related regulations. Single market and the next level of integration – monetary union (MU) – involve more than just eliminating barriers to trade. Steps toward harmonization of rules and beyond-trade aspects of economic integration become important features of this deeper agreement.

While this classification nicely fits the historical review of trade agreement before 1995, the emergence of the so-called new regionalism needs a little further examination on how to better classify regional integrations. From 250 active agreements notified to the WTO as of October 2010, more than 80% takes form as FTA. While the number of each type of agreement remained more or less the same until early 1990s, FTA has become the most popular type of agreement. In fact, except for EU enlargements, there have been only few numbers of custom unions formed during the last two decades.

4.2 Many Facets of Depth

However, the nature of FTAs after mid-1990s does not match the description of FTA above, since the agreements encompass broader aspects of the economic integration than just trade. While in terms of trade regime, the new wave of FTAs is normally less deep than the one described in CU, those agreements to certain extents also deal with rules making and regulatory issues among member countries, normally found in SM

type of agreement. Therefore, in order to classify RTAs more properly we need to extend the examination by looking at the contents of the agreements and go beyond the traditional Vinerian perspective.

When trying to assess RTAs, we have to keep in mind that there are many dimensions from which an agreement can be examined. Differentiating an agreement as PSA and FTA, for instance, emphasizes the assessment on “sectoral-coverage” dimension of RTAs; to examine if the agreement covers all economic sector or just few of them. While normally it applies on the coverage of tariff concessions, e.g. tariff reduction of agricultural and industrial products, this classification is also relevant for the coverage of other aspects of RTAs, such as trade in services and investment protection.

Another important dimension is the “liberalization level”, which emphasizes how far concession and agreements are provided among member countries. An agreement that eliminate tariff fully at the starting date of its implementation can be seen as having more “weight” to the one that needs 10 years of transition. An agreement that put forward mutual recognition agreement (MRA) on addressing technical barriers is more significant than just a statement for having future cooperation on the issue.

An alternative way to see the depth of a RTA is to emphasize “provisional coverage” of an agreement. Here, we don’t put too much effort to define the depth of the liberalization and sectoral coverage for each aspect of trade and economic integration, but rather only to see whether certain aspects of integration are mentioned and discussed in the agreement. An agreement that includes provisions on non-tariff barriers, for instance, can be seen as a “deeper” agreement than the one dealing only with tariff liberalization.

Most studies and datasets describing RTAs focus more or less in one of the dimensions explained above. Since current RTAs normally cover all or significant amount of economic sectors due to WTO requirement, datasets on sectoral-coverage may become less relevant, except for studies on product exclusions in RTAs⁶. Some studies and datasets put emphasize on the level of liberalization of RTAs, but limited only on certain provisions⁷. Horn et al. (2010) proposes an approach to map RTAs

⁶ The studies focus on tariff and non-tariff barriers as product exclusions are usually applied to trade in goods. See for example Damuri (2008).

⁷ Empirical studies are limited to the level of liberalization in good trade due to the availability of good quality tariff and NTMs statistics. There are some efforts to measure the level of liberalization in other

based on provision coverage in agreements, the third dimension we discussed above. What matters in this mapping approach is how far an agreement covers various aspects of economic integration; it only examines whether a particular provision is present or absent in the agreement, regardless the level of integration and liberalization for each aspect.

Study in this paper utilizes a dataset compiled based on the approach. With this we define the analysis of the depth of RTAs by focusing only on the third dimension of the depth, namely provision coverage of an agreement. We would see some patterns on provision coverages of the sample RTAs and try to infer “depth” characteristics of agreements from the available dataset.

4.3 Dataset on Provision Coverage of RTAs

Horn et al. (2010) lists 52 provisions commonly found in RTAs. The list is intended to be comprehensive covering all possible provisions or policy areas of trade agreements. It divides those provisions into two categories. The first one is ‘WTO plus’ (WTO+), which corresponds to provisions already discussed in the WTO but might be improved when RTAs’ members undertake the preferential treatments. The second one is ‘WTO extra’ (WTO-X), which describes other provisions currently not discussed in the WTO. Appendix A describes all 52 provisions listed in Horn et al. (2010) with relevant descriptions and explanations.

Based on this characterization of provisions, Horn et al. (2010) maps 14 agreements involving US and another 14 involving the EU, by looking at whether a policy area is covered by the agreements. In addition to identify the presence of provisions, it also tries to capture legal enforceability of provisions based on the occurrence of certain legal terms in the description of each provision.

The dataset from their study is later expanded by the Research Division of the WTO as described in WTO (2011), and Orefiche and Rocha (2011) to include more trade agreements involving other countries beside EU and US. It includes 118 agreements between WTO member countries, representing around 90% of world trade and covering most regions. The dataset takes form as binary variables containing one for each provision presents in an agreement and zero for the lack of it.

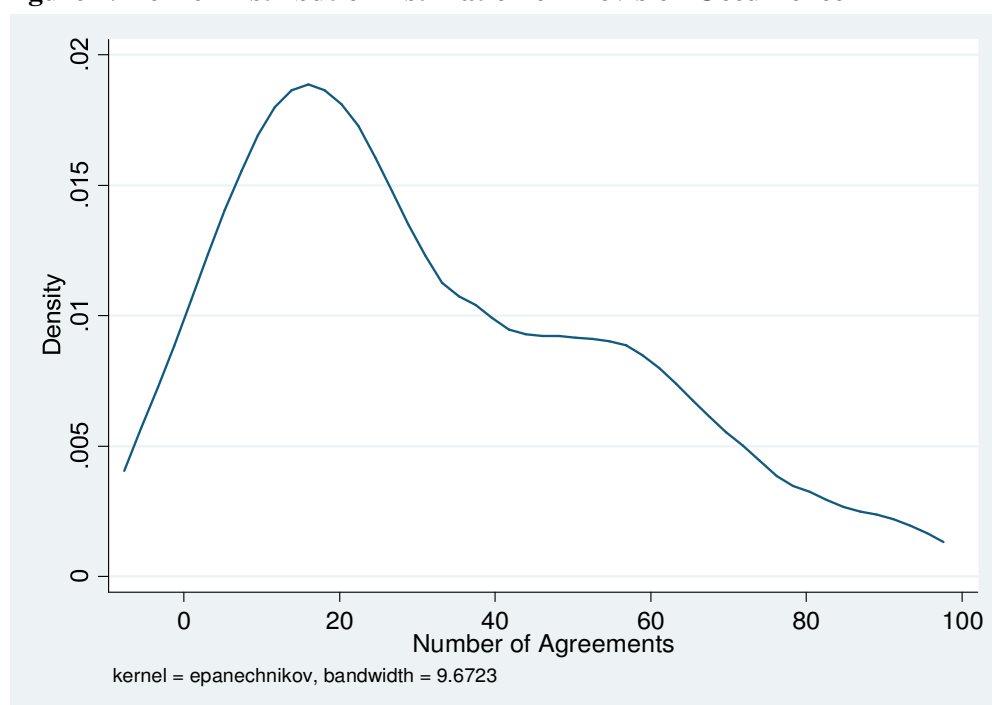
aspects of trade agreements such as in services trade or investments, but mostly descriptive analysis due to difficulties in codifying the agreement. See for example Mattoo and Sauv  (2008) in services .

4.4 Patterns of Provisions

While 52 provisions described in Horn et al. capture almost all possible policy areas that can be discussed in a RTA, many of those exist only in just a handful of agreements. In this part we look at the patterns of provisions in our sample RTAs. The goal of this analysis, in addition to present some descriptive features of those policy areas commonly discussed in RTA, is to come up with a smaller number of “core” provisions for further empirical analysis in the next section.

A simple statistical observation to the dataset reveals that many provisions are not represented frequently in the sample of trade agreements. Figure 1 describes Kernel approximation for the distribution of the number of agreement where each provision is present. The distribution is heavily skewed to the left, indicating that most provisions only present in few agreements, in this case less than 25. Only some provisions make their way to exist in more than 50 agreements. Looking at more detail into this information shows that only 12 provisions out of total 52 appear in 75% of the sample agreement.

Figure 1. Kernel Distribution Estimation of Provision Occurrence



This observation leads us to try finding certain provisions, which sufficiently appear in the sample agreements and share similar characteristics, which we may call as “core” provisions. The first step in categorizing these provisions is to calculate

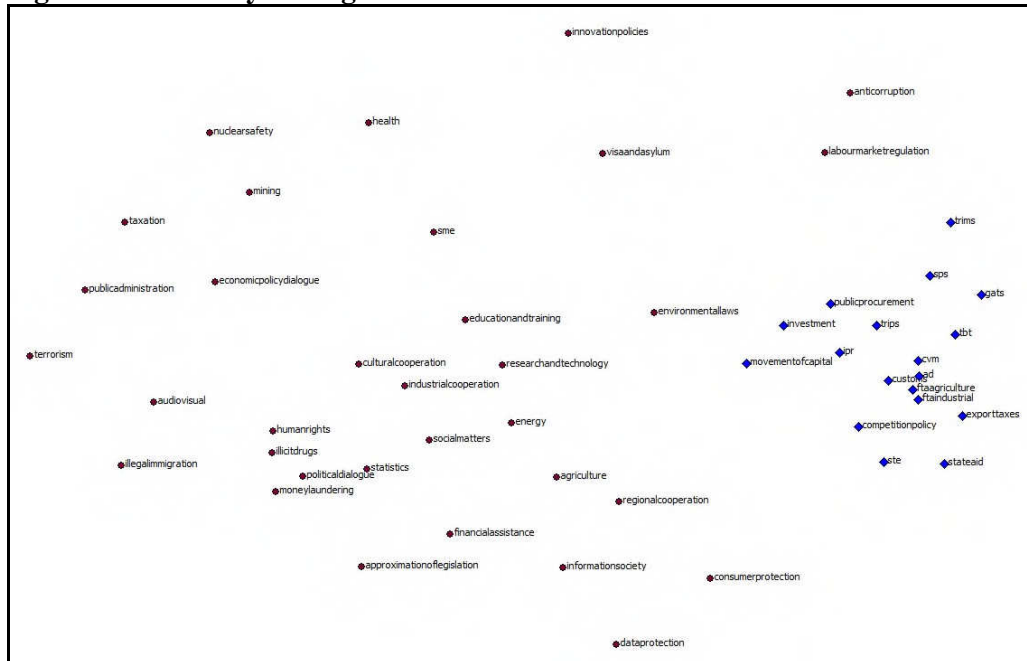
similarity of each provision to another based on frequency of appearance. For a pair of provisions p and q , similarity index can be calculated as below⁸:

$$Sim_{pq} = \frac{a}{a+b+c}$$

Where a is the number of agreement that contain both provisions, while b and c are the number of agreements that have only provision p and q respectively. This index measures proportion of matches when at least one of the provisions is present in an agreement. This similarity index is an equivalent of correlation coefficient for binary variable.

Using similarity indices for all provision, which come as a huge 52x52 matrix, we can tell how similar each provision to another. Provisions in tariff liberalization of industrial and agriculture goods, for example, have the highest index as both present in many similar agreements. While useful, this similarity matrix provides too much information for determining which provisions can be classified as core group. Now we turn to other statistical methods available for extracting primary information from the similarity matrix and give us certain classifications for the provisions.

Figure 2: Similarity among Provisions



⁸ We use similarity index for binary variable known as Jaccard index, where zero co-presence is not taken into account. Alternatively, the index can take account the co-occurrence of zero using Matching index. The results and conclusions are not that different.

In this study we utilize multidimensional scaling (MDS), an exploratory statistical technique that characterizes multiple objects so that more similar ones can be placed closer to each other than the less similar. The application of this technique to similarity matrix of provisions enables us to reduce the information into more manageable size. This 52x52 matrix, for instance, can be reduced into 52x2 vectors using this MDS technique. The result can then be projected on a two-dimension plane for visual exploration. Appendix B briefly discusses the technique applied for this analysis. The visual projection of similarity matrix is presented in Figure 2.

Each provision from the list of 52 policy areas of Horn et al. (2010) is represented by the node with the corresponding label. The position of each node relative to others describes how similar that corresponding provision is to others: the closer two nodes are, the more similar are the associated provisions. Bear in mind that while in a MDS graph, location of a particular node relative to others represents the distance between nodes, the dimensions themselves (horizontal and vertical axes) bear less significance. What matters is the relative position.

Another way to come up with a selected provisions having similar pattern of incidence in the dataset is by applying clustering analysis technique. The application of some clustering techniques including hierarchical and k-means clustering gives the same results as visual observations through the MDS mapping of provisions⁹. Robust results from application of various different techniques give us confidence to go for further analysis using only the selected “core” provisions instead of all 52.

The 18 core provisions can be divided into two main categories: provision implemented at border (border provisions) and provisions implemented behind border (behind-border provisions). The first category includes all measures related to trade in goods, i.e. tariff liberalization for industrial and agriculture goods, TBT and SPS, export taxes and anti-dumping and countervailing measures, as well as TRIPs and TRIMs, and movement of capital. The second category covers the rest of the provisions.

⁹ Hierarchical clustering is a simple agglomerative algorithm based on a set of nested partitions, while k-means technique takes the partition based on the nearest mean. In this study, we explore both clustering techniques using various calculation methods to define cluster distance, and come up with similar results. The result of hierarchical clustering is available in Appendix C.

Table 1. “Core” Provisions Based on Pattern of Incidence in the Dataset

Provisions	Description	Category
FTA industrial goods (FTA ind.)	Tariff liberalisation; elimination of non-tariff measures on industrial goods	Border-Tariff
FTA agricultural goods (FTA agr.)	Tariff liberalisation; elimination of non-tariff measures on agricultural goods	Border-Tariff
Customs administration	Provision of information; publication on the Internet of new laws and regulations; training	Border-Non Tariff
Export taxes	Elimination of export taxes.	Border-Non Tariff
Sanitary and phytosanitary (SPS measures)	Affirmation of rights and obligations under the WTO Agreement on SPS; harmonisation of SPS measures.	Border-Non Tariff
Technical barriers to trade (TBT)	Affirmation of rights and obligations under WTO Agreement on TBT; provision of information; harmonisation of regulations; mutual recognition agreements;	Border-Non Tariff
State trading enterprises (STE)	Establishment or maintenance of an independent competition authority; nondiscrimination regarding production and marketing conditions; provision of information; affirmation of Art XVII GATT provisions.	Behind Border - protection
Antidumping (AD)	Retention of AD rights and obligations under the WTO Agreement (Art. VI GATT	Border-Tariff
Countervailing measures (CVM)	Retention of CVM rights and obligations under the WTO Agreement (Art VI GATT	Border-Tariff
State aid	Assessment of anticompetitive behaviour; annual reporting on the value and distribution of state aid given; provision of information.	Behind Border - protection
Public procurement	Progressive liberalisation; national treatment and/or non-discrimination principle; publication of laws and regulations on the Internet; specification of public procurement regime.	Behind Border - Market Access
Trade-related investment measures (TRIMs)	Provisions concerning requirements for local content and export performance on foreign direct investment.	Border-Tariff
Trade-related intellectual property rights (TRIPs)	Harmonisation of standards; enforcement; national treatment, most-favoured nation treatment.	Border-Tariff
GATS	Liberalisation of trade in services.	Behind Border - Market Access
Competition policy	Maintenance of measures to proscribe anticompetitive business conduct; harmonisation of competition laws; Establishment or maintenance of an independent competition authority.	Behind Border - protection
Investment	Information exchange; Development of legal frameworks; Harmonisation and simplification of procedures; National treatment; mechanisms for settlement of disputes.	Behind Border - protection
Movement of capital	Liberalisation of capital movement; prohibition of new restrictions.	Border-Non Tariff
Intellectual Property Rights (IPR)	Accession to international treaties not referenced in the TRIPs Agreement.	Behind Border - protection

These provisions can be classified further following characteristics of the measures. Border provisions can be categorized into two types of measures: tariff related and non-tariff related. Behind-border provisions can also be arranged into two types: the ones deal with protection of partner activities in the host market, and provisions that provide more access to the market. Detailed classification of our 18 core provisions are described in the third column of Table 1.

4.5 Classification of Agreements

Using only the 18 core provisions described in Table 1, we classify trade agreements in our sample to get some insights on the “depth” of a particular agreement. With this coding, the idea is that to get more provisions to reflect greater depth of an agreement. For example, we can say that RTAs containing border provisions dealing with both tariff and non-tariff related measures are deeper than agreements only containing tariff related ones. The same logic can also be applied for behind border measures. Agreements with both border and behind border provisions are deeper than the ones containing only one type of the provisions. Certainly, here we only look at the provision coverage “dimension” of a RTA, regardless whether the agreement offers higher degree of liberalization or less for those particular policy areas.

Table 2 gives possible classification and hierarchy of RTAs based on their provision coverage. The first category, the lowest level of agreement, includes RTAs that only deal with border and tariff related measures, while higher level of agreements present provisions dealing with both types of tariff related and non-tariff measures. The third category covers some provisions addressing behind border measures; either the one offering protection or opening up market access. The deepest level of agreements covers all types of provisions.

It is worth mentioning that the categorization is exhaustive for all agreements, at least the ones in our dataset. This means that the data do not show the appearance of an agreement containing only non-tariff provisions without having tariff related ones, or only have behind-border provisions without border measures. This mutually exclusive categorization enables us to give meaningful interpretation of the coverage and “depth” of a particular agreement.

Table 2. Categorization of RTAs

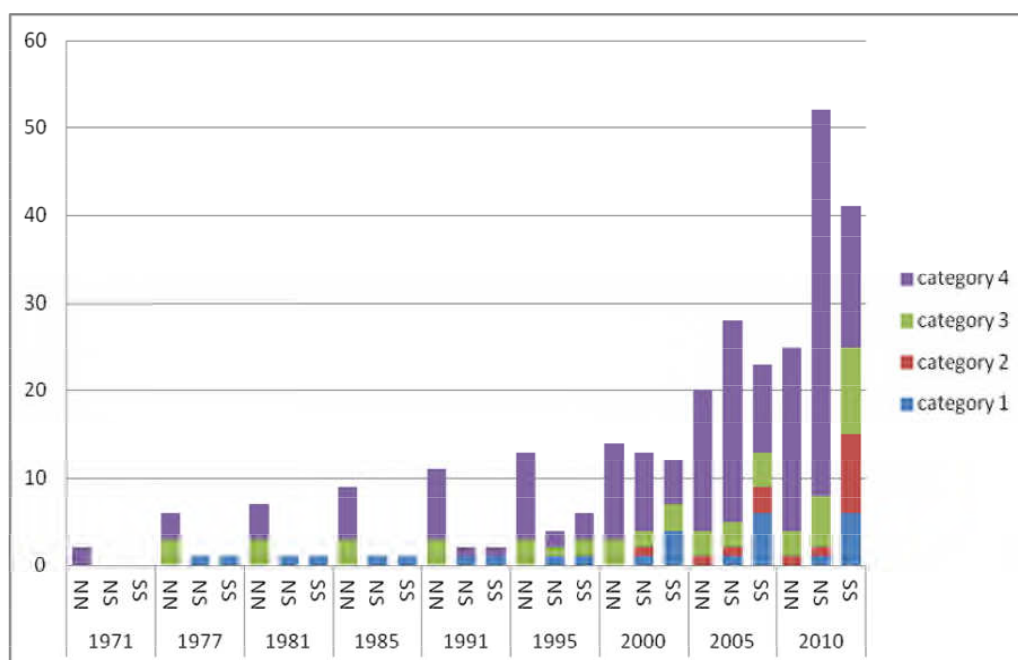
RTA's Category	Border: Tariff related	Border: Non-tariff related	Behind Border: Protection	Behind Border: Market Access
1	Yes	No	No	No
2	Yes	Yes	No	No
3	Yes	Yes	Yes	No
	Or			
	Yes	Yes	No	Yes
4	Yes	Yes	Yes	Yes

4.6 How Deep are the Concessions?

We now take a look at how deep the agreements in our sample dataset according to the categorization and definition explained above. From 118 agreements codified in the dataset, most of them, 68%, fall into category 4, meaning they cover all types of provisions described above. RTAs presenting tariff related provisions only, category 1 of RTA, counting for no more than 6% is the least frequent type of agreements. The second category takes account of around 9% of the whole dataset, while the rest fall into category 3.

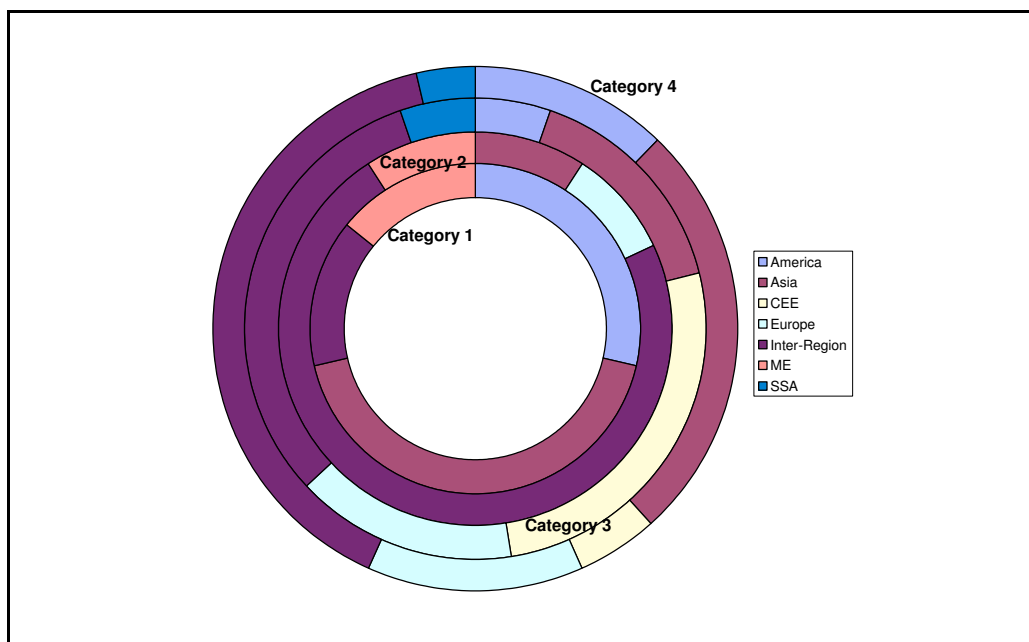
Figure 2 shows the evolution of trade agreements focusing on the depth of agreements and the nature of the partners (North-North, North-South, or South-South). It is clear that deeper agreements dominate at least since the mid-1990s. Looking at characteristics of countries forming RTAs, Figure 3 also shows that trade agreements among developed countries (north-north, NN) is more likely to have deep agreements, as well as agreements between developed and developing countries (north-south NS). While some agreements among developing countries can have deeper integration, they are also likely to form shallow agreements, which cover only liberalization on trade in goods. The more recent agreements between developing countries might only include limited concessions, although tendency towards deeper integration is becoming stronger.

Figure 3. Deeper Integration: North-South Characteristics



Recent RTAs also encompass regional aspect of trade agreement since many are formed among countries at different regions. Figure 3 presents regional aspect of integration where each category is represented by a slice of pie from the shallow one (inner slice) to the deepest agreement (outer slice). From the graph, it is quite clear that most of category 4 agreements, 39%, are among countries from different regions, while RTAs among Asian countries come at the second place (26%). Inter-region RTAs are less prevalence for other categories of agreements. This indicates that agreement among countries at the same region might focus on trade aspect as distance plays an important role to this activity; far away integration needs to find other policy areas to increase its benefits. Nevertheless this observation can also be explained by the fact that many inter-region agreements are among developed and developing countries, which are likely to form deeper level of integrations.

Figure 4. Regional Classification and Deeper Integration



To find out more about characteristics of deeper integration, in particular with regards to the emergence of production network, we now turn to the empirical exercise. We utilize the definition of “depth” of an agreement explained in this section and try to see some evidences on how the emergence of deep agreements can be explained by the development of production network.

5 Empirical Analysis

This section turns to studying the determinant of the depth of RTAs. As discussed, the main hypothesis to be explored is whether the nature of the emergence of production sharing affects the depth of the agreement..

5.1 Estimation Strategy

Specification

The empirical testing takes the fourfold categorisations of RTAs as the dependent variable. The issue then arises from how to measure the extent of supply-chain trade between the two nations. There are several empirical measures of supply-chain trade in the literature. The simplest way to capture a particular country's involvement in global production network is by observing trade statistics in parts and components of manufacture products, especially related to machinery sectors. Measuring production network with trade statistics allows wider coverages of observation, both in term of time span and country-wise. In this study we follow this technique by using trade statistics in parts and components to capture how far countries being involved in production network.

There are two aspects related to production network that influence the decision for a country to form trade agreement with its partners. The first is general; the second is partner-specific. The first aspect concerns the extent to which a country is interested in being connected to a production network. This indicates its willingness to comply with internationally-accepted business conducts which may lead to harmonizing efforts of rules and regulation including signing-up deeper trade agreements to facilitate further integration to global production network. The more enthusiastic it is to be connected to global network, the higher its motivation in forming trade agreements with deeper commitments.

The second aspect concerns the nation's particular interest in connecting with a specific trading partner. This indicates how keen the country in giving up flexibility upon the implementation of its domestic regulation by signing up an agreement. It also suggests how important for the country to attract a particular partner to be involved in an agreement. Stronger bilateral relation between a specific country pair in production network creates higher motivation for them to go for a deeper integration toward harmonizing theirs behind border measures.

To capture the first aspect, we observe how important multilateral trade in parts and component in a country's total trade – gauging this by the share of trade in parts and components in the country's total trade. The second aspect is represented by the bilateral trade in parts and components between a specific country pair. Based on this identification, the econometric estimations take form below

$$CAT_{ijt} = \beta_1 pc_sh_{it} + \beta_2 \ln pc_exp_{ijt} + \delta Z_{ijt} + \varepsilon_{ijt} \quad (1)$$

Where CAT_{ijt} is the category of RTA that may take place between country i and country j ; taking values from 0 for a country pair without trade agreement, up to 4 for a country pair with wider coverage of provisions. Variable pc_sh_{it} is the share of trade in parts and components to the total trade of country i , while pc_exp_{ijt} represents the value of bilateral exports in parts and components between the two countries for country i and j respectively. Higher share of parts and components in total trade of i is expected to make the country more willing in accepting deeper commitments in trade agreements, regardless of the trading partner. Meanwhile, higher bilateral values of exports between a pair of trading partners increase the likelihood of those countries in establishing a RTA with deeper provisions.

Our variables of interests appear only once in the above specification, namely only for country i . This specification strategy sees the RTAs as “directed relations”, in which country i becomes the major part of it. Since a RTA is basically not a directed relation, each one of both trading partners need to be specified as country i while each possible country pair comes out twice in the panel data.

The two last terms define a vector of control variables related to the decisions of forming RTA and an error term to capture unobservable related factors, both defined at country-pair level. The control variables include some geographic and economic factors following Baier and Bergstrand (2004).

We include some gravity-like variables to control for influences besides production network indicators such as product of GDP of the two countries in natural logarithm, and the ratio of the GDPs. Trading partners with bigger size, captured by product of GDP, are expected to be more likely to form RTA with deeper commitments. Similarity in economic size is also expected to have effect on the decision. Countries that have big differences in their economic sizes are expected to be less likely to form RTA.

To capture differences in endowment, we include log ratio of GDP per capita and add its square value to account for non-linearity effect of the variable. Countries with big difference of per capita GDP, indicative to large differences in economic level and endowment, are expected to see bigger benefits from deeper integration and are more willing to have such provisions. However, effect of the differences in economic level is not linear: trading partners with a very large difference are less likely to form agreement. This is captured by negative sign of the square value of difference in per capita GDP.

Since the deeper integration in trade agreement is about regulatory coherence and harmonizing rules, there is a need to control past efforts toward bilateral regulatory coherence between the two countries in the past. Here, we include the involvement of the country pair in bilateral investment treaties.

To capture geographical effects, we include distance between the two countries and the distance of this country pair to the rest of the world. Closer trading partners are expected to see the importance of deeper integration, while countries that are far away from the rest of the world also tend to form deeper integration RTA. We also include other pair characteristics, such as common language, colony in the past, common border, etc. All the above control variables are country pair-specific or formulated as pair-specific.

Data

Data for econometric tests come from various sources. As mentioned, data for dependent variable come from WTO RTA dataset described in WTO (2011) and Orefiche and Rocha (2011). The dataset covers 118 agreements from 163 countries. Since trade agreement in the empirical specification (1) takes place at bilateral level, while many agreements have more than two member countries, the dataset need to be transformed to country-pairs. It results to 26406 possible country pairs, of which 4,388, or around 17% of all possible pairs in the sample are those with trade agreements. Description of trade agreement as bilateral relation can be found in the Appendix D

Trade statistics come from Comtrade available through WITS interface. Data for parts and components is based on classification suggested by Kimura (2007) using detail categorization of SITC version 2. The use of this classification allows us to collect the

data for trade back to 1976. However some countries are not available until latter year. Other data related to geographical aspects of country pairs come from CEPII distance and gravity dataset, while data on economic performance comes from World Development Indicator. More detail description is available in Appendix E.

Econometric Challenges

There are several problems and considerations in conducting empirical test for the hypothesis. The obvious one is the nature of dependent variables, which take form as category ranging from 0 (no agreement) to 4 (deep agreement). This requires more attention as ordinary least square (OLS) method would lead to some problems such as heteroskedasticity and non-conforming predicted probabilities as prediction can go beyond the range of the category. To overcome this problem we conduct the test based on a non-linear model for ordered categorical dependent variables.

Supposed that the ordinal observable variable CAT is a function of unobserved continuous latent variable CAT^* which indicates certain level of utility from forming a trade agreement¹⁰. There are several cut points, δ_k , being applied to this latent variable that determines the value of observable category.

$$CAT \leq g \Leftrightarrow CAT^* \leq \delta_g \quad (g = 0, \dots, 4)$$

If the continuous latent variable is given by

$$CAT^* = \sum_k \beta_k X_k + \varepsilon = Z + \varepsilon$$

And ε follows standard logistic distribution, then the probability of an observation would fall to a certain category g goes by

$$P(CAT \leq g | Z) = \frac{\exp(Z - \delta_g)}{1 + \exp(Z - \delta_g)}$$

This ordered logit model would serve as the main empirical test.

Another econometric problem relates to the simultaneity problem, especially for the variables of interest, as those are derived from trade data, which are likely to be affected by the implementation of trade agreement. We handle the problem by using three years moving average before time t . To further minimize the effect of this

¹⁰ Subscript ijt identifying the observations is hidden for the sake of simplicity.

problem, we include only not-yet-switched country pairs. A country pair remains in the data as long as the relevant agreement is not signed and being dropped afterward.

The panel data nature of our dataset enables us to capture certain aspects attached to the country or country pair by including fixed effects components in the estimation. Unfortunately, the estimation of ordered logit with fixed effects suffers from coincidental problems that might produce biased estimation of coefficients, especially when there are only a small number of observations for each group. To substitute country-pair effects, we include as many as possible control variables affecting both trading partners as described above.

To see how country-specific characteristics may affect the result, some relevant country-specific characteristics are included. Memberships of the countries in WTO may affect the result as WTO members may see deeper agreements as substitute to the stalled multilateral talk. The country's economic growth can also affect the decision given that countries might see RTA as a way to boost growth during the downturn. We use index of Economic Freedom of the World (EFW index) from Fraser Institute to capture the regulatory regimes in the countries to see if those with better regulations tend to be more assertive to deeper commitments in RTAs. Nevertheless, we also see how country fixed effects may affect the results. An alternative to fixed effect is to include random effects at country pair level by estimating random effect estimation.

Another concern for this type of estimation, as pointed by Beck (1998), is the possibility of serial correlation due to relatively long time span of the panel. To deal with this, time-fixed-effect need to present in the econometric specification. Alternatively, a natural cubic spline function of the number of years that a country pair has been without an agreement provides better solution for this problem. We include six natural cubic splines to overcome this problem. In addition, the density of regional trade agreements for each year is also included to capture the global trend of this phenomena.

As can be seen in specification (1), some explanatory variables, particularly variables of interest, are country-specific while the dependent variable is a country-pair variable. The country-specific variables need to be represented for each individual country i and j . Consequently, the same agreement between a country pair appears

twice in the panel data. While there is no important problem in estimating the specification, the estimated standard error needs to be adjusted by clustering the observation for each agreement.

Alternatively is to conduct the estimation as “undirected” country pair, in which an agreement only appears once in the panel data and each observation contains country-specific variables of i and j separately in the specification. Which country appears as i or j is determined arbitrarily. The econometric specification for this estimation looks like equation (2) below. The result of this alternative specification would be reported along with result from specification (1).

$$CAT_{ijt} = \beta_1 pc_sh_{it} + \beta_2 pc_sh_{jt} + \beta_3 \ln pc_exp_{ijt} + \beta_4 \ln pc_exp_{jit} + \delta Z_{ijt} + \varepsilon_{ijt} \quad (2)$$

5.2 Results and Discussions

Estimation Results

The estimations of specification (1) and (2) are presented in Table 3. The first column presents OLS estimation of the first specification taking advantage of panel characteristics of the dataset by incorporating country-pair fixed effects. The estimations show that some control variables borrowed from Baier and Bergstrand (2004) are significant with the same signs as expected, except for few variables.

The product of real GDP, as an important aspect in capturing the size of the country pair, gives a positive effect as expected. Ratio of real GDP of the trading countries, as a proxy of economic similarity, has positive effect while it is expected to be negative. Coefficients of the variables related to real GDP per capita, as a proxy of level of economic endowment, also either insignificant or show different signs than expected.

More importantly, the estimated coefficients for our variables of interest have the expected signs in the OLS estimation. The share of parts and components trade in total trade, as a proxy of participation of the respected country to global production network, shows positive effect. A country that participates actively in the practice of production sharing is likely to form deeper integration. Another variable that capture bilateral relation in production sharing practice between the specified trading partners, namely the product of parts and components exports of both countries, also shows a significant effect to a deeper integration. It has a positive sign indicating that trading partners that are actively involved in production sharing practice tend to form a deeper integration.

Parts of the reasons for different estimation results come from improper technique of estimation. As explained earlier, the dependent variable is not continuous, but rather a category constructed in hierarchical order and limited only to five different values. In order to properly estimate specification (1), we set up an ordered logit model consisting of a system of 5 equations, with assumption that the coefficients for all the explanatory variables take the same values but with different constant terms.

Columns 2, 3, 4 and 5 present the estimations of specification (1), in which country-specific variables appear only once in an observation representing country *i*. Note that instead of having constant parameters, ordered logit model produce cut-point for each outcome. Parameter Cut1, for instance, correspond to the intercept on the model producing outcome 1. An observation, in this case a country pair, with linear approximation of its independent variables higher than the parameter cut1, but below cut2, is likely to be in category 1. Another interpretation of these parameters is explained below.

Column 2 presents the estimation using ordered logit model for the whole sample, including the observations that represent post RTAs implementation. This estimation, as explained above, runs the risk of reverse causality. Some important control variables seem to be insignificant. Estimation in column 3 tries to correct the problem by including dropping the observations after a RTA taken place. This estimation gives significant results for the variables of interest and most control variables, except ratio of GDPs.

In column 4 we introduce country-specific fixed effects in order to capture some characteristics at country level. However, this estimation runs the risk of incidental parameters problems. Therefore we set up another estimation including relevant country characteristics, e.g. WTO memberships and indicators of economic regulatory regime in column 5. It can be seen that introducing country characteristics improve the coefficient of control variables, while at the same time does not change the significance and signs of variables of interest. To complement all these estimations, a random effect probit estimation is conducted and gives similar result as shown in column 6.

Coefficients for all variables of interest remain significant in all estimations. The estimations of specification (1), both without and with fixed effects, give strong

significant result for the coefficient of parts and components share in total trade. Higher share of parts and components trade leads to higher possibility of the country to form agreements with deep integration commitments.

Table 3. Results of Estimations

	OLS D	OLOGIT D1	OLOGIT D2	OLOGIT D3	OLOGIT D4	REOPROBIT	OLS U	OLOGIT U
P&C Share in i's Total Trade	0.327** (0.100)	3.621*** (0.249)	3.231*** (0.305)	15.95*** (0.971)	1.804*** (0.378)	0.746* (0.311)	0.453*** (0.117)	4.126*** (0.526)
P&C Share in j's Total Trade							0.120*** (0.025)	4.041*** (0.427)
P&C Trade i to j (ln)	0.00248*** (0.000)	0.0450*** (0.002)	0.0403*** (0.004)	0.0273*** -0.004	0.0423*** (0.005)	0.0400*** (0.00334)	0.00163*** (0.000)	0.0314*** (0.007)
P&C Trade j to i (ln)							0.00196*** (0.000)	0.0112 (0.006)
Sum of ln GDPs	0.000789 (0.001)	-0.0941*** (0.005)	0.0807*** (0.011)	0.186*** (0.012)	0.0567*** (0.013)	-0.0409** (0.0133)	-0.00260*** (0.001)	0.0417** (0.015)
Ratio of GDPs (ln)	0.000601 (0.001)	-0.00151 (0.009)	0.00297 (0.016)	-0.000655 -0.012	-0.0351* (0.016)	-0.0563*** (0.0144)	0.000656 (0.001)	0.0161 (0.017)
Ratio of per capita GDP (ln)	-0.00158 (0.003)	-0.00102 (0.042)	0.486*** (0.076)	0.475*** (0.058)	0.440*** (0.079)	-0.0941 (.)	0.00268 (0.004)	0.575*** (0.085)
Square of Ratio GDPPC	-0.00135** (0.001)	-0.0992*** (0.011)	-0.194*** (0.019)	-0.190*** (0.015)	-0.191*** (0.020)	-0.107 (.)	-0.00263** (0.001)	-0.225*** (0.023)
Distance (ln)		-0.446*** (0.022)	-0.907*** (0.030)	-0.843*** (0.027)	-1.018*** (0.032)	-1.031*** (0.0596)		-0.959*** (0.036)
Remoteness		-0.0830*** (0.005)	0.0287*** (0.008)	0.0782*** (0.006)	0.0222** (0.008)	0.186*** (0.0107)		0.00892 (0.009)
Border Share		-0.415*** (0.058)	-0.392*** (0.119)	-0.331*** (0.088)	-0.474*** (0.133)	0.814*** (0.107)		-0.457*** (0.133)
Common Language		0.0853* (0.038)	0.302*** (0.077)	0.561*** (0.062)	0.143 (0.084)	0.403 (.)		0.257*** (0.086)
Colony		-0.426*** (0.074)	-0.184 (0.155)	-0.476*** (0.117)	-0.269 (0.164)	0.0583 (0.165)		-0.151 (0.161)
Common Colony		-0.312*** (0.042)	-0.382*** (0.105)	-0.568*** (0.086)	-0.469*** (0.114)	-1.374 (.)		-0.566*** (0.127)
BIT	0.0526*** (0.006)	0.00870 (0.040)	0.217*** (0.063)	0.163*** (0.049)	0.273*** (0.067)	1.662 (.)	0.0501*** (0.008)	0.115 (0.068)
WTO Membership i					0.311*** (0.076)			
Growth i					-2.194*** (0.536)			
Economic Freedom country i					0.172*** (0.023)			
FTA Density					115.9*** (4.632)			
cut1	-0.0258 (0.0278)	-11.05*** (0.304)	0.106 (10.96)	-5.425*** (0.361)	63.32*** (13.95)	-2.889*** (0.00755)	0.121*** (0.0352)	-7.294 (18.18)
cut2		-10.05*** (0.301)	0.199 (10.96)	-4.294*** (0.361)	63.41*** (13.95)	-2.816*** (0.00620)		-7.214 (18.18)
cut3		-9.962*** (0.301)	0.227 (10.96)	-4.179*** (0.361)	63.43*** (13.95)	-2.794*** (0.00571)		-7.186 (18.18)
cut4		-9.197*** (0.300)	0.373 (10.96)	-3.132*** (0.361)	63.58*** (13.95)	-2.682 (.)		-7.032 (18.18)
Observations	462946	494039	462946	462946	378381	462946	170902	170902
R-square or Pseudo R-Square	0.00935	0.668	0.172	0.229	0.231		0.0101	0.175
Fixed or Random Effects	Yes	No	No	Yes	No	Yes	Yes	No

Standard errors in parentheses ** p<0.05 * p<0.01 *** p<0.001

Estimations are conducted using OLS and ordered-logit model. Columns 1-6 present the estimations of specification (1) in the text, while the last two columns shows the results of specification (2). The OLS estimations include country-pair fixed effects while ologit estimation in column 4 uses country-specific fixed effects. Parameters cut in ologit models are representation of intercepts for the each outcome, while in the OLS is simply the constant term.

The bilateral aspect of production sharing practice, which is represented by value of bilateral exports between a particular trading partners also have a positive effect on the decision of a country moving towards a deeper integration. The coefficient for

total parts and components trade between the two countries remains significant in all specifications and estimation techniques. This indicates that two countries with intensive trade in parts and components between them are more likely to form an agreement with deep integration commitments

The “undirected” estimation, which include characteristics of each country pair into the same observation as described in specification (2), also leads to similar result. Shares of parts and components in total trade are positively related to countries’ decision for deeper integration. More significant trade in parts and components in both countries brings about bigger likelihood in forming RTA with behind border commitments. The bilateral part of the specification, namely the exports of each country to its trading partner, also conform the expectation that countries with higher bilateral trade in parts and components have the tendency to be more enthusiastic in embracing deeper integration.

Interpretation

The non-linear nature of logistic estimation makes the interpretation of the estimations results to not be straightforward. Analysis beyond significance and direction of coefficients needs further elaboration. One way to interpret coefficients is by comparing them. For instance, the magnitude of coefficient for share of parts and components is around 80 times bigger than bilateral exports of parts and components. It can be interpreted that 1 percentage point increase in the share coefficient is equivalent to an increase of bilateral exports 2.22 (or $e^{0.8}$) times bigger.

Table 4. Marginal Effects of Selected Variables

	OLS D	OLOGIT D	OLS U	OLOGIT U
P&C Share in i's Total Trade	0.327**	0.437***	0.453***	0.2267***
P&C Share in j's Total Trade			0.120***	0.222***
P&C Trade i to j (ln)	0.002***	0.005***	0.00163***	0.002***
P&C Trade j to i (ln)			0.00196***	0.0006
Sum of ln GDPs	0.0007	0.011***	-0.00260***	0.002**
Ratio of GDPs (ln)	0.0006	0.001	0.000656	0.0009
Observations	462946	462946	170902	170902

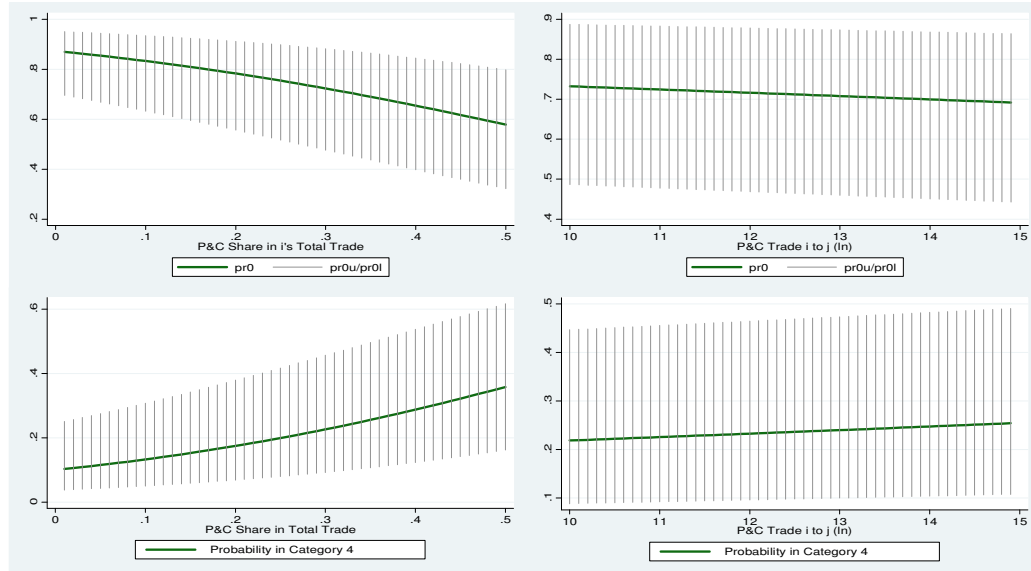
Note: the marginal effects are calculated at mean of the associated variables

More formal way to interpret coefficients of ordered-logit estimation is by calculating marginal effects of the coefficient for a certain outcome. The marginal effect of a coefficient can be seen as the change in predicted probabilities of having a certain outcome due to a one unit change in the associated explanatory variable.

$$\frac{\partial \Pr[y = 4]}{\partial \mathbf{X}} = \frac{\exp(\delta_4 - \mathbf{X}\beta)}{1 + \exp(\delta_4 - \mathbf{X}\beta)} - \frac{\exp(\delta_3 - \mathbf{X}\beta)}{1 + \exp(\delta_3 - \mathbf{X}\beta)}$$

Now, the marginal effects from different models can be compared to each other, including the linear estimations produced by the OLS. The first column shows OLS result of specification (1) together with fixed country-pair effect. It can be compared to the result of OLOGIT model in column 2 that produces slightly different magnitude for our variables of interests. The difference might come from the absence of country-pair fixed effects in the logit model, although it is substituted by several time invariant country-pair characteristics. The difference can also come from the fact that in the ordered logit model we can only look at marginal effect for specific outcome, in this case category 4 RTA, while the margins in OLS apply to all categories. Another comparison is between OLS estimation for specification (2) and the ordered logit model, presented in third and fourth columns.

Figure 5. Predicted Probabilities



Note: the marginal effects are calculated at mean of the associated variables

Figure 5 gives another way to interpret the result. The graphs describe the predicted probabilities of our variables of interest. The top panel gives the predicted probabilities of not having trade agreement for an “average” country pair. As the

share of parts and components increases, the probability of those trading partners remains unbound to an agreement falls. Similar pattern also apply to the bilateral trade between the two partners, although in a much lesser degree. The bottom panel shows the probability of the same country pair to move to RTA category 4. The share of parts and components positively influences the decision, in much larger magnitude to the bilateral trade relation.

Further Discussions

One important feature of the emergence of production network and production sharing practice is the fact that it tends to be regionalized. Trade in parts and components among countries of the same region is more likely to be higher than inter-regional trade. It is interesting to see the effects of regionalization of production sharing practice on the likelihood of having trade agreements with deeper commitments.

Table 5. Regional Perspectives

	Share of P&C in Trade	Bilateral P&C Trade	
		Same Region	Different Region
East Asia	-5.051*** (0.280)	0.0442** (0.0171)	-0.00778 (0.00650)
Eastern Europe and Central Asia	4.837*** (0.668)	-0.0188 (0.0180)	0.0372*** (0.00659)
Europe	8.785*** (0.276)	0.137*** (0.0101)	0.0310*** (0.00764)
Latin America and Caribbean	9.340*** (0.574)	0.0461*** (0.0102)	0.0201* (0.00941)
Middle East and North Africa	1.475* (0.651)	0.0773*** (0.0217)	0.0638*** (0.00667)
North America	9.501*** (0.383)	0.124** (0.0427)	-0.000513 (0.0124)
Pacific	13.13*** (1.530)	0.343*** (0.103)	0.0327 (0.0204)
South Asia	-16.25*** (1.914)	0.0838 (0.0917)	0.0417*** (0.00860)
Sub-Saharan Africa	28.61*** (0.557)	-0.0235 (0.0198)	0.0992*** (0.00672)

Standard errors in parentheses ** p<0.05 ** p<0.01 *** p<0.001

Estimations are based on specification (1) as ordered logit model with regional interactions for the specified variables.

There are three aspects worth further exploration. First is to examine to what extent the variable share of parts and components, as a representation of involvement in

global production network, affects the willingness of countries from a particular region to form RTAs with deeper commitments. Second is to look at how important the level of production sharing practice among countries in the same region would influence the decision in forming such RTAs. The last aspect takes the examination a little further by looking at how attractive countries in a particular region to become RTA's partner of other countries outside the region, based on production sharing activities.

Table 6 provides a regional examination of the linkage between wider commitments in RTAs and production network. The first column gives the coefficients of share in parts and components of countries in different regions, while the other two columns show coefficients for a bilateral trade in parts and components. Countries in East Asia on average seem to be less eager in pursuing RTAs with wider commitments. Increases in contribution of parts and components in trade do not lead to higher commitments in RTAs. They also seem to be less active in attracting deeper integration with countries from different regions, although bilateral trade in parts and components among the countries increase the probability of having deeper agreement.

This is a bit surprising since the region is considered to be one of the most integrated to the production network. There are two possible reasons. First is the fact that countries in the region have been quite late in embracing formal integration. ASEAN countries, as the biggest group in the region, has just finalized some agreements with other countries, but mostly limited to trade aspects. Another explanation is from the dataset itself that gives no information on the evolution and transformation of the agreements. While ASEAN countries started as "shallow" trade agreement in 1990s, it just recently evolved to include many behind border measures. This information is not captured in the dataset.

Those estimations provide empirical evidences that higher involvement in production network and more intensive bilateral relation in production sharing practice increase the likelihood of trading partners to form trade agreement with wider commitments. However, it raises a question whether the effect only applies to the formation of RTAs with wider coverage of provisions or also for more general trade agreements. While positive coefficient in the logit model implies that probability of being in lower category decreases as the value of variable increases, the assumption that each

category retains the same coefficients value affects the estimation such that it does not explicitly answer the question.

In order to address this question, we conduct an estimation based on a nominal category model. Unlike the previous ordered category model, in this estimation there is no need to assume that certain category is higher than others. What matters is comparison between each category and the base one. In our case, we can compare each RTA category to the situation without RTA. To simplify the examination, RTAs category 1 and 2 are bundled together as border-measure trade agreement (1), while category 3 and 4 are grouped as RTAs with border and behind-border measures (2).

Table 6. Shallow vs. Deep

	0 ==> 1	0 ==> 2
P&C Share in i's Total Trade	-3.195* (1.514)	3.751*** (0.303)
P&C Trade i to j (ln)	-0.0397*** (0.010)	0.0551*** (0.005)
Sum of ln GDPs	0.365*** (0.027)	0.0365** (0.012)
Ratio of GDPs (ln)	-0.218*** (0.054)	0.0270 (0.016)
Ratio of per capita GDP (ln)	1.139*** (0.237)	0.423*** (0.080)
Square of Ratio GDPPC	-0.248*** (0.059)	-0.191*** (0.021)
Distance (ln)	-0.934*** (0.083)	-0.917*** (0.032)
Remoteness	0.208*** (0.023)	0.00425 (0.008)
Border Share	-0.188 (0.264)	-0.507*** (0.134)
Common Language	1.423*** (0.183)	0.0502 (0.087)
Common Colony	0.474* (0.228)	-0.554*** (0.118)
BIT	0.0986 (0.202)	0.231*** (0.067)
Constant	-115.4 (69.551)	-5742.8 (.)
Observations	462946	462946
Pseudo R-Square	0.211	0.211

Standard errors in parentheses ** p<0.05 *** p<0.01 **** p<0.001
Estimations are based on specification (1) using multinomial logit model.

Table 7 presents the estimation using a multinomial logit model. The first column shows the change from situation without RTA to shallow integration, while the second column describes the change from no-RTA to deeper integration. It seems that

both situations come from different process with different factors behind. While in the first estimation, all control variables borrowed from Baier and Bergstrand (2005) appear to be significant and follow the expectation, some controls do not appear to be significant or have different signs in the second estimation.

Our variables of interest also behave differently in both estimations. The share of parts and components does not significantly influence the decisions of countries to engage in border-measure-only RTAs, while it shows clear significance in the formation of agreements with wider provisions. The same also applies to bilateral trade. This indicates that both decisions might come from different type of process, in which the practice of production sharing mostly affect the formation of deeper integration, but not the shallow one.

Extensions and Robustness Exercises

To check whether the result is robust to changes in several aspects, we conduct four more estimations. Three estimations examine robustness of the results to the changes in data sample, while another estimation assesses other indicators to represent production sharing of a particular country.

The first robustness check examines the results if we only concern about North and South bilateral relation. Selecting only country pairs involving developed and development countries as the sample does not change the result. The share of parts and components trade of a country remain positively linked to the likelihood of embracing deeper integration, while total bilateral trade in parts and components of the trading nations also shows the same positive effect.

The second exercise involves taking away European Union integration from the sample. While EU can be seen as a role model of deeper integration, various unique characteristics of the relations amongst those nations may affect the results. The estimation without involving integration among countries in Europe does not affect the estimation too much.

There is also a concern that country pairs forming RTA are substantively different from country pairs that do not. If this were indeed the case, then our two groups would not be directly comparable in our estimates of RTA formation. This problem relates to the selection bias of the sample and is normally dealt with a Heckman selection model. In this case it is necessary to conduct estimation with instruments

that are exogenous to our variables of interest and the dependent variables. Unfortunately we don't have such privilege.

Table 7. Robustness Exercises

	w/o EU	Only N-S	Propensity Score	Investment	Bilateral Share
P&C Share in i's Total Trade	2.548*** (0.346)	2.281*** (0.382)	3.440*** (0.338)		4.306*** (0.291)
FDI over GDP				0.221*** (0.020)	
P&C Trade i to j (ln)	0.0306*** (0.005)	0.0204*** (0.006)	0.0447*** (0.004)	0.0479*** (0.004)	
Share of P&C exports in Bilateral Trade					1.142*** (0.267)
Sum of ln GDPs	0.0669*** (0.012)	0.0323 (0.019)	-0.200*** (0.013)	0.0910*** (0.012)	0.145*** (0.010)
Ratio of GDPs (ln)	0.0115 (0.017)	0.0438* (0.020)	-0.00213 (0.015)	0.00872 (0.016)	-0.00784 (0.016)
Ratio of per capita GDP (ln)	0.633*** (0.084)	0.0229 (0.125)	-0.0658 (0.081)	0.497*** (0.077)	0.464*** (0.076)
Square of Ratio GDPPC	-0.213*** (0.021)	-0.168*** (0.028)	-0.0163 (0.020)	-0.198*** (0.020)	-0.188*** (0.019)
Distance (ln)	-0.837*** (0.036)	-0.921*** (0.047)	0.503*** (0.032)	-0.888*** (0.031)	-0.988*** (0.030)
Remoteness	0.0186* (0.009)	-0.0454*** (0.014)	-0.0680*** (0.008)	0.0336*** (0.008)	0.0314*** (0.008)
Border Share	-0.0390 (0.132)	-0.813** (0.274)	0.369*** (0.105)	-0.351** (0.121)	-0.406*** (0.120)
Common Language	0.489*** (0.078)	0.577*** (0.138)	0.120 (0.073)	0.274*** (0.078)	0.354*** (0.076)
Colony	-0.0764 (0.168)	-0.148 (0.224)	-0.0366 (0.149)	-0.189 (0.157)	-0.174 (0.157)
Common Colony	-0.345** (0.108)	-1.237*** (0.235)	-1.007*** (0.099)	-0.398*** (0.107)	-0.358*** (0.104)
BIT	0.301*** (0.071)	0.220* (0.088)	0.286*** (0.065)	0.272*** (0.064)	0.317*** (0.062)
Observations	452423	214148	462946	419613	452121
Pseudo R-square	0.141	0.204	0.0733	0.18	0.17

Standard errors in parentheses * p<0.05 ** p<0.01 *** p<0.001
Estimations are based on specification (1) using ordered logit model

Instead of Heckman selection, we use propensity score reweighting to deal with the possibility of sample selection. The idea is to imitate a randomized experiment with a treatment and control group where both groups are substantively similar. The “treatment” in our case is country pair with RTA formation. The propensity score can be seen as “distance” between observation in the “control” and “treatment” groups: the bigger the propensity score is, the closer is the control observation. We then apply

the propensity score to give weight for each observation before running the estimation. The result is shown in column 3 of Table 8.

The last exercise examines other indicators that may be related to the importance of production sharing practice in a particular country. Instead of using trade in parts and components, we look at the foreign direct investment in that country. The result shows that the share of FDI in GDP also positively related to the likelihood of having deeper commitment in a regional trade agreement. Another variation of the estimation is to use the share of bilateral trade in parts and components to total bilateral trade between the country pair. The result remains significant and positive.

6 Conclusion

This paper seeks to find some evidences on the link between the emergence of 21st century trade, also known in many other terms such as international production network or production sharing, and the phenomena of 21st century regionalism, indicated by the deepening of commitments in RTAs. Indicator for the deepening of commitments in this study follows the work of Horn et al. (2010), which looks at whether certain aspects of integration are mentioned and discussed in trade agreement.

The first contribution of this study is the use of systematic methods in classifying trade agreements based on the provision of commitments. There are 52 policy areas of commitment found in a 21st century agreement as listed by Horn et al. (2010). However, this study comes up with a group of 18 “core” policy areas commonly observed in RTAs by applying several exploratory techniques. The patterns of those core provisions are in line with the economic reasoning for deeper integrations. Using this group of provisions, we classify the sample of RTAs in our dataset into four categories of “depth” for the empirical work.

The second contribution comes from the empirical findings. The link between production sharing practice and deepening of commitments in RTAs can be decomposed into two effects: general or the network effect, and bilateral or partner specific. The general effect, which concerns the extent to which a particular country is interested in being connected in the production network, is captured by multilateral trade in parts and components. The partner-specific effect, which represents the

importance of a partner in the country's production network, is embodied in bilateral trade of parts and components.

The empirical finding shows that the more intensive a country is in the international production network, the more likely it would form RTAs with deeper commitments. Moreover, the country would be more inclined to establish an RTA with an important partner in its production network. While both factors have positive impacts to the decision in forming deeper agreement, the general effect seems to dominate. This finding is quite robust; changing sample and specifications, as well as the use of alternative indicators do not change the result significantly.

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APPENDIX A

List of Provisions in Recent RTAs

Horn, Hendrik., Petros C. Mavroidis and André Sapir (2010). "Beyond the WTO? An Anatomy of EU and US Preferential Trade Agreements," *The World Economy*, vol. 33(11), pp 1565-1588.

WTO Plus

FTA industrial goods	Tariff liberalisation; elimination of non-tariff measures on industrial goods
FTA agricultural goods	Tariff liberalisation; elimination of non-tariff measures on agricultural goods
Customs administration	Provision of information; publication on the Internet of new laws and regulations; training
Export taxes	Elimination of export taxes.
Sanitary and phytosanitary (SPS measures)	Affirmation of rights and obligations under the WTO Agreement on SPS; harmonisation of SPS measures.
Technical barriers to trade (TBT)	Affirmation of rights and obligations under WTO Agreement on TBT; provision of information; harmonisation of regulations; mutual recognition agreements;
State trading enterprises (STE)	Establishment or maintenance of an independent competition authority; nondiscrimination regarding production and marketing conditions; provision of information; affirmation of Art XVII GATT provisions.
Antidumping (AD)	Retention of AD rights and obligations under the WTO Agreement (Art. VI GATT)
Countervailing measures (CVM)	Retention of CVM rights and obligations under the WTO Agreement (Art VI GATT)
State aid	Assessment of anticompetitive behaviour; annual reporting on the value and distribution of state aid given; provision of information.
Public procurement	Progressive liberalisation; national treatment and/or non-discrimination principle; publication of laws and regulations on the Internet; specification of public procurement regime.
Trade-related investment measures (TRIMs)	Provisions concerning requirements for local content and export performance on foreign direct investment.
Trade in services agreement (GATS)	Liberalisation of trade in services.
Trade-related intellectual property rights (TRIPs)	Harmonisation of standards; enforcement; national treatment, most-favoured nation treatment.

WTO X

Anti-corruption	Regulations concerning criminal offence measures in matters affecting international trade and investment.
Competition policy	Maintenance of measures to proscribe anticompetitive business conduct; harmonisation of competition laws; Establishment or maintenance of an independent competition authority.
Consumer protection	Harmonisation of consumer protection laws; exchange of information and experts; training.
Data protection	Exchange of information and experts; joint projects.
Environmental laws	Development of environmental standards; enforcement of national environmental laws; establishment
Investment	Information exchange; Development of legal frameworks; Harmonisation and simplification of procedures; National treatment; Establishment of mechanisms for the settlement of disputes.
Movement of capital	Liberalisation of capital movement; prohibition of new restrictions.
Labour market regulations	Regulation of the national labour market; affirmation of International Labour Organisation (ILO) commitments; enforcement.
Intellectual Property Rights	Accession to international treaties not referenced in the TRIPs Agreement.
Agriculture	Technical assistance to conduct modernisation projects; exchange of information.
Approximation of legislation	Application of EC legislation in national legislation.
Audio visual	Promotion of the industry; encouragement of co-production.
Civil protection	Implementation of harmonised rules.
Innovation policies	Participation in framework programmes; promotion of technology transfers.
Cultural cooperation	Promotion of joint initiatives and local culture.
Economic policy dialogue	Exchange of ideas and opinions; joint studies.
Education and training	Measures to improve the general level of education.
Energy	Exchange of information; technology transfer; joint studies.
Financial assistance	Set of rules guiding the granting and administration of financial assistance.
Health	Monitoring of diseases; development of health information systems; exchange of information.
Human rights	Respect for human rights.
Illegal immigration	Conclusion of re-admission agreements; control of illegal immigration.
Illicit drugs	Treatment and rehabilitation of drug addicts; joint projects on prevention of consumption; reduction of drug supply; information exchange.
Industrial cooperation	Assistance in conducting modernisation projects; facilitation and access to credit to finance.
Information society	Exchange of information; dissemination of new technologies; training.
Mining	Exchange of information and experience; development of joint initiatives.
Money laundering	Harmonisation of standards; technical and administrative assistance.
Nuclear safety	Development of laws and regulations; supervision of the transportation of radioactive materials.
Political dialogue	Convergence of the parties' positions on international issues.
Public administration	Technical assistance; exchange of information; joint projects; Training.
Regional cooperation	Promotion of regional cooperation; technical assistance programmes.
Research and technology	Joint research projects; exchange of researchers; development of public-private partnership.
Small and medium enterprise	Technical assistance; facilitation of the access to finance.
Social matters	Coordination of social security systems; non-discrimination regarding working conditions.
Statistics	Harmonisation and/or development of statistical methods; training.
Taxation	Assistance in conducting fiscal system reforms.
Terrorism	Exchange of information and experience; joint research and studies.
Visa and asylum	Exchange of information; drafting legislation; training.

APPENDIX B

Brief Explanation of Multi Dimensional Scalling

The basic idea of this analysis is to “reduce” dimensions of the data in order to provide clearer view on its pattern, usually in two dimensions (Scott 2007) to facilitate mapping in a normal Cartesian system. Unlike other methods of dimensional reduction, such as *principal component analysis*, techniques developed in MDS do not require the linearity of data.

Let the vertices of graph $G(V,E,w)$ are seen as objects \mathbf{V} and the symmetric weight w_{rs} become the dissimilarity measure between object r and s , $\delta_{rs} = w_{rs}$. With this definition, the greater the weight the closer the distance is between the two nodes. An arbitrary mapping of ϕ from \mathbf{V} to \mathbf{X} , a set of points in a Euclidean space, is also defined. The distance between points of x_r and x_s is given by d_{rs} . The aim of multidimensional scaling analysis, in general, is to find a mapping ϕ for which d_{rs} is approximately equal to a monotonic transformation of dissimilarity between the vertices $f(\delta_{rs})$ following the minimization of certain objective function also known as *stress function*.

The stress function is the measure of fitness of the estimation. By minimising the function, which is basically variant of the difference between d_{rs} and $f(\delta_{rs})$, the best configuration of \mathbf{X} representing the vertices is attained. One of the most commonly used stress function is

$$S = \sqrt{\frac{\sum_{r,s} (d_{rs} - \hat{d}_{rs})^2}{d_{rs}^2}}$$

which is minimized with respect to d_{rs} , and also \hat{d}_{rs} using an isotonic regression. The minimization of S is a complex operation that can be achieved only by using computing algorithm (Cox and Cox 2001). Numerous algorithms have been developed to find better result of MDS. The analysis that follows makes use of an algorithm called MiniSSA, which is based on the minimization of the above stress function.

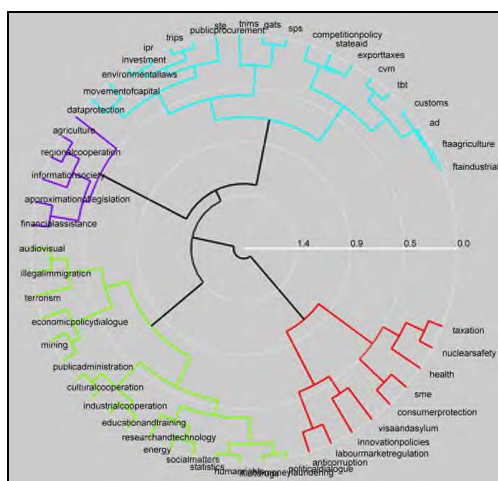
Appendix C

Hierarchical Clustering Dendrogram of RTAs Provisions

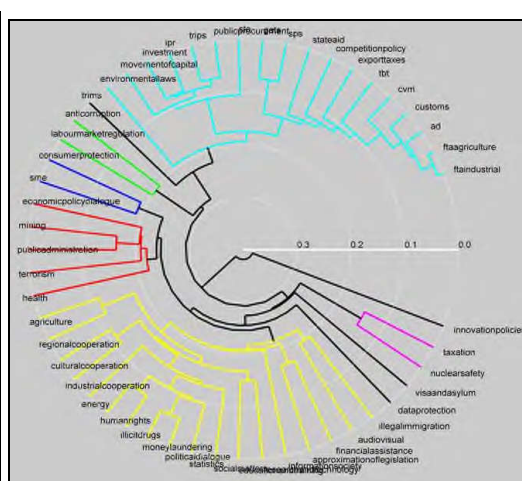
Diagrams below describe the results of hierarchical clustering analysis of the RTAs provisions. The left is the application of clustering using “complete” method, while the right one uses “single” method. Colour-coding sub-branches represent possible grouping of various provisions, in which the same colour branches belong to the same group.

All core provisions of RTA in section 3 seem to be closer than others. They also belong to the same group of lighter blue sub-branches. In short, the application of clustering analysis gives similar classification to the Multidimensional Scaling in section 3.

“Complete” Clustering



“Single” Clustering



Appendix D

RTAs in Bilateral Form by Categories

Country	1	2	3	4	Country	1	2	3	4
ALB	1			32	ITA	1		4	44
ARE		5			JAM				27
ARG	2	1		3	JOR	13			28
AUS				11	JPN				11
AUT	1		7	52	KAZ			1	
BDI				4	KEN				16
BEL			4	44	KHM			1	5
BEN				12	KNA				27
BGD	5	4			KOR	4			12
BGR	1		7	52	KWT	10	4		
BHR		5		1	LBN	13		27	
BIH	1		27	5	LCA				27
BLZ				27	LKA	6	3		
BOL	4			3	LSO			4	9
BRA	1	1		4	LTU	1		7	52
BRN	7				LUX			4	36
BTN		6			LVA	1		7	52
BWA			4	9	MAC				1
CAN				7	MAR	13	1		28
CHE			18	6	MDA			11	5
CHL	2	1	2	44	MDG				16
CHN	5		2	12	MDV		6		
CIV			27		MEX				31
CMR				27	MKD	1			32
COL				4	MLT	1		7	52
COM				3	MOZ				13
CRI				7	MUS				23
CYP	1		7	52	MWI				23
CZE	1		7	52	MYS	8		1	6
DEU			4	44	NAM			4	9
DNK	1		4	44	NIC				7
DOM				33	NLD			4	44
DZA				27	NOR			18	5
ECU				3	NZL				10
EGY	12			45	OMN	9	5		
ESP	1		7	52	PAK	1	5	1	1
EST	1		7	52	PAN			1	
ETH				3	PER				6
FIN	1		7	52	PHL	8		1	5
FRA			4	44	POL	1		7	52
GBR			4	44	PRT	1		7	52
GEO	1				PRY	1	1		4
GRC	1		7	52	QAT		5		
GRD				27	ROM	1		7	52
GTM				7	RWA				3
GUY				27	SAU	10	4		
HKG				1	SDN	12			3
HND				7	SEN				12
HRV		1		32	SGP	8			7
HUN	1		7	52	SLV				7
IDN	8		1	5	SRB		1	27	5
IND	4	9	6	2	SUR				27
IRL	1		4	44	SVK	1		7	52
ISL			18	5	SVN	1		7	52

Country	1	2	3	4
ISR		1		31
SWE	1		7	52
SWZ			4	4
SYC				25
SYR	40	1		
THA	8		1	5
TTO				27
TUN	13	1		27
TUR	4	6		30
TZA				13
UGA				4
UKR			1	
URY	2	1		3
USA				16
VCT				27
VNM	2		1	5
YEM	13			
ZAF			3	37
ZMB				10
ZWE				11

APPENDIX E

Data Sources and Variables Description

Variable/Data	Description	Source
pc_sh_{it}	Share of parts and components in i 's total trade $\frac{X_i^{pc} + M_i^{pc}}{\sum_k X_i^k + M_i^k}$	Comtrade data base through WITS
pc_exp_{ijt}	Bilateral exports of parts and components of i to j in \ln	Comtrade data base through WITS
Sum of \ln GDPs	$\ln(GDP_i \times GDP_j)$	World Bank World Development Indicators
Ratio of GDPs (\ln)	$\ln\left(\frac{GDP_i}{GDP_j}\right)$	World Bank World Development Indicators
Ratio of per capita GDP (\ln)	$\ln\left(\frac{GDPcap_i}{GDPcap_j}\right)$	World Bank World Development Indicators
Square of Ratio GDPPC	$\left[\ln\left(\frac{GDPcap_i}{GDPcap_j}\right)\right]^2$	World Bank World Development Indicators
Distance	Log of the great circle distances between trading partner country capitals (km)	CEPII Distance Dataset
Remoteness	Relative distance of a pair of continental trading partners from the rest of the world	Calculated from CEPII Distance Dataset
Border Share	Dummy variable = 1 if the trading partners share a border	CEPII Distance Dataset
Common Language	Dummy variable = 1 if the trading partners share the same language.	CEPII Distance Dataset
Colony	Dummy variable = 1 if one of the trading partners was a colony of another.	CEPII Distance Dataset
Common Colony	Dummy variable = 1 if the trading partners share the same colonizer	CEPII Distance Dataset
BIT	Dummy variable = 1 if the trading partners signed a Bilateral Investment Treaties	Constructed from INCSID Database
WTO Membership i	Dummy variable = 1 if country i is a WTO member	Constructed from WTO Database
Growth i	GDP growth of country i	World Bank World Development Indicators
Economic Freedom country i	Index of Economic Freedom of the World	Fraser Institute EFW Index http://www.freetheworld.com/index.html
RTA Density	World trade covered by RTA	Calculated from trade statistics

APPENDIX F

Statistical Summary of Explanatory Variables

Variable	Mean	Std. Dev.	Min	Max
P&C Share in i's Total Trade	0.070	0.047	0.000	0.358
P&C Trade i to j (ln)	-2.343	7.145	-6.908	18.088
Sum of ln GDPs	47.347	3.094	37.202	59.342
Ratio of GDPs (ln)	2.651	1.913	0.000	11.099
Ratio of per capita GDP (ln)	1.906	1.313	0.000	6.406
Remoteness	1.101	2.954	0.000	9.477
Distance (ln)	8.789	0.711	4.107	9.952
Border Share	0.012	0.107	0.000	1.000
Common Language	0.135	0.341	0.000	1.000
Colony	0.014	0.117	0.000	1.000
Common Colony	0.091	0.287	0.000	1.000
BIT	0.095	0.293	0.000	1.000
WTO Membership i	0.797	0.402	0.000	1.000
Economic Freedom country i	6.201	1.122	2.300	9.100
Growth_i	0.038	0.044	-0.309	0.345
RTA Density	0.060	0.046	0.005	0.166