Did the least developed countries benefit from duty-free quota-free access to the Japanese market?

INSTITUTE OF DEVELOPING ECONOMIES

IDE Discussion Papers are preliminary materials circulated
to stimulate discussions and critical comments

IDE DISCUSSION PAPER No. 434

Did the least developed countries benefit from duty-free quota-free access to the Japanese market?

Tadashi Ito♦, Takahide Aoyagi*

December 2012
Revised September 2017

Abstract

Countries classified as least developed countries (LDCs) were granted duty-free quota-free (DFQF) access to the Japanese market. This study examines the impact of that access and finds that, in general, it benefited the LDCs. The construction of concordance tables for Japan's 9-digit tariff line codes over 19 years enables analyses at the tariff line level, which overcomes a possible aggregation bias. The exogenous nature of DFQF access mitigates the endogeneity problem. The triple difference estimator shows that in general the LDCs benefited from DFQF access to the Japanese market. Tariff lines which were granted zero tariffs and substantial preference margins over other countries resulted in successful import into the Japanese market.

Keywords: LDCs, Japan, Tariff liberalisation, Duty-free quota-free access, WTO Doha Round
JEL classification: F13, F14

◆ Corresponding author: Faculty of International Social Sciences, Gakushuin University, Mejiro 1-5-1, Toshima-ku, Tokyo, Japan; tadashi.itoATgakushuin.ac.jp or Tadashi.ItoATgraduateinstitute.ch. In preparing this paper, I benefited from discussion with Richard Baldwin, Hiroshi Mukunoki, Hiroshi Sato, Akiko Yanai, Takahiro Fukunishi, Toshiyuki Matsuura, Kazunobu Hayakawa, Pierre-Louis Vézina, Solleder Olga, and Andreas Lendle. This paper was done as a part of a study program at the Institute of Developing Economies, when I was affiliated there.

* Fuji Chimera Institute, 1-5, Kodenmacho, Nihonbashi, Chuou-ku, Tokyo 105-0001, Japan: taoyagi@fcr.co.jp

The Institute of Developing Economies (IDE) is a semigovernmental, nonpartisan, nonprofit research institute, founded in 1958. The Institute merged with the Japan External Trade Organization (JETRO) on July 1, 1998. The Institute conducts basic and comprehensive studies on economic and related affairs in all developing countries and regions, including Asia, the Middle East, Africa, Latin America, Oceania, and Eastern Europe.

INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

Did the least developed countries benefit from duty-free quota-free access to the Japanese market?

Tadashi Ito◆, Takahide Aoyagi*

First draft: December 2012, This revised draft: September 2017

Abstract:

Countries classified as least developed countries (LDCs) were granted duty-free quota-free (DFQF) access to the Japanese market. This study examines the impact of that access and finds that, in general, it benefited the LDCs. The construction of concordance tables for Japan's 9-digit tariff line codes over 19 years enables analyses at the tariff line level, which overcomes a possible aggregation bias. The exogenous nature of DFQF access mitigates the endogeneity problem. The triple difference estimator shows that in general the LDCs benefited from DFQF access to the Japanese market. Tariff lines which were granted zero tariffs and substantial preference margins over other countries resulted in successful import into the Japanese market.

Key words: LDCs, Japan, Tariff liberalisation, Duty-free quota-free access, WTO Doha Round

JEL Classification:F13, F14

◆ Corresponding author: Faculty of International Social Sciences, Gakushuin University, Mejiro 1-5-1, Toshima-ku, Tokyo, Japan; tadashi.itoATgakushuin.ac.jp or Tadashi.ItoATgraduateinstitute.ch.
In preparing this paper, I benefited from discussion with Richard Baldwin, Hiroshi Mukunoki, Hiroshi Sato, Akiko Yanai, Takahiro Fukunishi, Toshiyuki Matsuura, Kazunobu Hayakawa, Pierre-Louis Vézina, Solleder Olga, and Andreas Lendle. This paper was done as a part of a study program at the Institute of Developing Economies, when I was affiliated there.

* Fuji Chimera Institute, 1-5, Kodenmacho, Nihonbashi, Chuou-ku, Tokyo 105-0001, Japan: taoyagi@fcr.co.jp

1. INTRODUCTION

Conflict of interests among World Trade Organization (WTO) member countries have bogged down the Doha Development Round of trade negotiations on major issues such as agriculture, industrial tariffs and nontariff barriers, services, and trade remedies. Started in 2001 at Doha, the round has yet to yield a major agreement. The impasse is so serious that in April 2011, then the WTO Director-General Pascal Lamy "asked members to think hard about 'the consequences of throwing away ten years of solid multilateral work. "Although considerable time and effort has been spent on issues such as agriculture, a key focus of the Doha Round is development. Indeed, one of the few achievements of the Doha round is the duty-free quota-free (DFQF) market access granted by developed countries to products from the least developed countries (LDCs). The Hong Kong Ministerial Declaration of 18 December 2005 says that

"…developed-country Members, and developing-country Members declaring themselves in a position to do so, agree to implement duty-free and quota-free market access for products originating from LDCs …."

At the time of the declaration, the European Union had already begun to grant preferential tariffs to LDC countries under "Everything But Arms" initiatives, and the United States had been offering similar terms to Sub-Saharan African countries under the African Growth and Opportunity Act (AGOA). Japan started to grant zero tariffs to LDCs from around 2000 and accelerated the pace of this at around 2005.

This study evaluates whether Japan's DFQF access has favourably affected LDC exports to Japan. Analysis is performed at the tariff line level by constructing concordance tables for 9-digit tariff line codes. While most evaluations of trade liberalisation policies, and especially of preferential trade

agreements, struggle with endogeneity, DFQF systems have an inherently low level of endogeneity because of their exogenous nature.[1]

Literature

In terms of the impact of the WTO-led trade liberalisation on the LDCs, previous literature has dealt almost exclusively with possible preference erosion for LDCs. When the Doha Round started in 2001, its aims were across-the-board trade liberalisation. However, LDCs were afraid that the trade preferences they had been enjoying would be eroded as tariffs for other countries were decreased by Doha Round negotiation. In response to this fear, some economists used the Computable General Equilibrium model to study the potential effects of preference erosion; two such studies are Low, Piermartini, and Richtering (2006) and Carrère and de Melo (2009). However, the Doha Round is stalled, and across-the-board tariff liberalisation is far from being achieved. On the other hand, on the front of development issue of the Doha round, the developed countries agreed to grant duty-free quota-free access to the LDCs.[2] By 2008, developed countries' DFQF treatment for LDCs reached almost 100 percent product coverage. This has provided sufficient data for *ex-post* analysis. To the best of our knowledge, this paper is the first attempt to carry out an *ex-post* assessment of the DFQF treatment agreed in the Hong Kong ministerial declaration. One *ex-post* analysis of the effect of a system similar to the DFQF is the study by Frazer and Van Biesebroeck (2010); their study examines the effect of the AGOA. However, AGOA's tariff elimination scheme is different from the DFQF scheme in that AGOA is selective on both countries and products. Eligibility for AGOA requires a basic level of political and democratic freedom within the country. In terms of eligible

[1] See Baier and Bergstrand (2007) for example for the endogeneity issues related to the evaluation study of Preferential Trade Agreement. Various attempts to address the endogeneity issues are neatly and well explained in Egger, Egger and Greenaway (2008).

[2] An ex-ante analysis on potential benefits from preferential tariffs given to the LDCs by EU under EBA was done by Hoekman, Ng, and Olarreaga (2002); their analysis uses partial equilibrium simulation. They showed that EBA would induce larger exports from LDCs to the EU market at the expense of other developing countries.

products, "the AGOA legislation explicitly allows the president only to grant duty-free treatment for non-apparel articles 'after the U.S. Trade Representative and the U.S. International Trade Commission have determined that the article is not import sensitive when imported from African countries…'" (Frazer and Van Biesebroeck (2010)). Frazer and Van Biesebroeck (2010) mention this selection issue as a limitation in their study.

2. DATA

This paper uses Japan's annual tariff data at the tariff line level (HS 9-digit code) from World Integrated Trade Solutions and the corresponding trade (import) data from Japan's customs office. The period of study is from 1996 to 2014. The year 1996 was chosen as the starting year because Japan began to grant zero tariffs to LDCs from around the year 2000. More reasons for this choice of period are discussed later in the text.

2.1. Tariff data

It is important to include not only *advalorem* tariffs but also *ad-valorem* equivalent tariffs, which can be estimated for non-*advalorem* tariffs. Developed countries have been reducing the number of non-*advalorem* tariffs, the majority of which are specific tariffs, by changing them to *advalorem* tariffs in accordance with WTO member consensus. However, many non-*advalorem* tariffs remain in effect. Because the DFQF agreements cover essentially all tariff line codes, there are many tariff line codes for which tariffs have been eliminated for LDCs; however, non-*advalorem* tariffs remain in effect for the other countries. Thus, to evaluate the effects of the DFQF agreements, it is necessary to simulate *advalorem* equivalent tariffs to extant non-*advalorem* tariffs. For non-*advalorem* tariffs, *advalorem* equivalent tariffs computed by UNCTAD 1 are used.[3]

[3] UNCTAD 1 is the first in a list of methods suggested by the United Nations Conference on Trade and Development for computing *ad valorem* tariff equivalents. This method was chosen from among four suggested methods to calculate *advalorem* equivalent tariffs because UNCTAD 1 produces *advalorem* equivalent tariffs for the largest number of tariff lines.

2.2. Concordance

A major challenge arises when one attempts to perform analyses across highly disaggregated levels, such as the 9-digit level of this study. Since the Harmonised System (HS) (at the 6-digit level) changes on average every five years[4], Japan's 9-digit codes also change to remain in conformity with the HS.[5] Thus, in order to track the same product (i.e., tariff line), we need to make concordance across codes in different years. Concordance lists of different (9-digit) HS codes are available from the Customs office, Ministry of Finance, Japan, but it is just concordance lists not concordance tables. Thus, we have created concordance tables for Japan's 9-digit code lines by checking the obsolete-new concordance lists one at a time; this is almost certainly the first such attempt, one of our achievements in this study. Adjusting the algorism proposed by Schott and Pierce (2011) for the US customs codes to our dataset, we concord Japan's 9-digit HS codes over years. The details for the need of concordance algorism and the procedures are in the appendix. If only those tariff line codes which have an identical code number throughout the years of 1996 to 2014 are used, only 3564 codes out of total number of 9000 codes are left. By using the concordance tables we have constructed by the algorism, we can keep almost all codes. Some codes are still dropped. This is because some codes are intrinsically unable to be concorded for reasons such as the unknown goods and the ambiguously defined goods.

2.3. Trade data

Japan's trade data cover all transactions at the 9-digit level whose amounts are more than or equal to 210000 yen (approximately 2100 US dollars) for all partner countries. Thus, these data cover most commercial trades of Japan. Taiwan is a major trading partner for Japan, and the data cover

[4] To be precise, the HS codes changed in 1992, 1996, 2002, 2007 and 2012.

[5] The first 6 digits are common across all countries (internationally harmonised), and further disaggregation is done individually by each country. Japan adds three more digits.

trade with Taiwan even though UN COMTRADE data do not cover Taiwan. Data at the 9-digit level are available from 1988. In the analyses that follow, the whole available period (1988–2014) was used when consistent tariff lines were not required, and the period of 1996–2014 was used when consistent tariff lines were required. The concordance has not been extended back to HS 1992 or HS 1988 because the benefit to be gained by doing so is far exceeded by the cost of the extension. To extend the period covered by the concordances would necessitate construction of concordance tables for HS 1996 - HS 1992 and HS 1992 - HS1988. This would further unavoidably decrease the number of tariff lines to be studied due to intrinsically non-concordable lines between different HS versions. Briefly, a longer study period reduces the number of feasible tariff line codes. For the purposes of this study, extending the concordances offers little benefit because the change of the zero tariff lines took place in the period 1996–2011.

3. DESCRIPTIVE ANALYSIS

This section discusses descriptive properties of changes in the number of zero tariff lines by country group (according to tariff type), the evolution of import values by country group, preference margins, evolution of import values by preference margins, and the incidence of imports, by tariff line, from LDCs.

3.1. Evolution of zero tariffs

Figure 1 shows time-series of the total number of tariff lines whose tariffs are zero. Japan's tariff can be grouped into four large categories: most favoured nation (MFN) tariffs, Generalized System of Preferences (GSP) tariffs; GSP tariffs applied to LDCs (LDC-GSP); and tariffs for free trade agreement (FTA) partners. MFN tariffs are imposed on most of Japan's imports. For WTO members who are developing countries, Japan (and other developed countries) gives preferential tariffs under

the GSP. Among the major trading partners of Japan, China is a notable example of a GSP beneficiary. Under the DFQF system, LDCs receive the most preferential treatment.[6]

The change to zero tariff lines for FTA partners is not shown in the figure. Although Japan has signed FTAs with several countries, tariff eliminations for FTA partners have either been completed only recently or are still in the process; moreover, Japan's trade level with its FTA partners is still small. From Figure 1, it is evident that Japan accelerated the elimination of tariffs for LDCs shortly before 2000, eliminated a substantial number of tariffs in 2001, and then in 2007 expanded the zero tariff lines to almost 100% of tariff lines. LDC countries currently enjoy about 3500 more zero tariff lines than GSP beneficiaries and about 5000 more zero tariff lines than MFN countries. As the total number of tariff lines is about 9000, this preference is substantial.

=== Figure 1 ===

3.2. Import value by country group

Import values by country group are shown in Figure2. The three main country groups are LDCs, GSP beneficiary countries, and the rest of the world (REST). REST is almost identical to MFN because almost all of Japan's trading partners are WTO members. Russia is an exception. However, Russia ranks only 20th among import partners of Japan and accounts for only 1.52%, on average, of the import values in the period of study. Import value from LDCs is substantially lower than from the REST and GSP groups, so the value from LDCs is indicated by the right axis. The right axis has a much smaller scale than the left axis, which corresponds to the MFN and GSP groups. Import value from all country groups increased steadily until 2008; in 2009, the value decreased due to the trade collapse caused by the global financial crisis. It is worth noting that the growth of import value from LDCs between 2003 and 2008 is higher than from the MFN or GSP groups. Since the GSP group

[6] See the appendix for lists of GSP beneficiary countries and LDCs.

includes large and rapidly expanding BRIC countries (BRICs: Brazil, Russia, India, and China; Russia is not in the GSP group), Figure 3 shows import value with BRIC countries separately. The results with BRIC countries excluded (Figure 3) are qualitatively similar to the results with them included (Figure 2).

=== Figure 2 & Figure 3 ===

3.3. Preference margins

The LDCs enjoy a substantially larger number of zero tariff lines than other countries, and it is also important to examine the magnitude of the preference margins. The 9-digit tariff code which corresponds to the largest preference margin for LDCs is 121299190, "Tubers of konnyaku (*Amorphophalus*, whether or not cut, dried or powdered)," with a preference margin of 5537.27%. One hundred 9-digit tariff lines have preference margins of more than 100%. These extremely large preferences may enable LDCs to begin exporting the preferentially treated goods to the Japanese market. Table 1 shows the number of tariff line codes for which the preference margin exceeds 10% or 20%. For example, 1081 tariff line codes correspond to products for which LDCs have preference margins of more than 10% with respect to GSP beneficiary countries.

=== Table 1 ===

Because goods from LDC are limited in scope (e.g., they do not produce sophisticated industrial goods), it is worth investigating which industries are subject to preference margins. As Table 2 shows, most products are in the Food industry or the Apparel and Textiles industry, in which the LDCs are likely to have comparative advantages. Thus, the DFQF system may have a large impact on LDC exports to the Japanese market.

=== Table 2 ===

3.4. Import value by country group and product group

To identify the effect of the DFQF system, tariff line codes are divided into two groups. The treated group is the group of codes for which positive number of tariff rates were applied in 1996 but became zero by the year 2008.[7] The non-treated group (control group) is the group of codes for which tariffs were already zero in 1996. By comparing import value between these two groups and across country group, we can see whether the DFQF system seems to have had a positive impact on LDCs' exports to Japan. Figures 4 and 5 show the results for non-treated (control) group products and treated group products, respectively. For non-treated (control) group products, the import values from REST and the non-LDC GSP steadily increased from 2001 to 2008 whereas the import value from the LDCs increased only modestly in that period. After the drop in 2009 due to the global financial crisis, the import values from all the three country groups rose but especially from the LDCs. On the other hand, in the case of the treated group products, the import value from the LDCs steeply increased from 2001 to 2008, more than from REST and much more than from the non-LDC GDP. After the drop in 2009, the import values from the rest of the world and the non-LDC GSP almost recovered the pre-financial crisis level by 2014, but that from the LDCs did not. The preference margins granted by the DFQF scheme seem to have a positive impact on LDC countries' exports to Japan in 2001-2008, pre-financial crisis, but the negative impact of the financial crisis lingered.

=== Figure 4 & Figure 5 ===

3.5. Incidence of imports

The previous section studies the import values, what the literature calls "intensive margins". The DFQF system might also have induced some products to be exported for the first time, what the literature calls "extensive margins". Because LDCs are small and very poor (on average, GDP per

[7]The year 2008 was chosen because Japan's zero tariffication was almost completed by that year. Results when 2014 was used as the cutoff year were very similar.

capita of less than 905 US dollars), even a small amount of exports is important especially when a product is exported for the first time. Table 3 shows the number of tariff lines imported, counting duplicates, into the Japanese market by country group and by tariff line group. If two products are both imported into Japan from two countries, the number recorded is four (i.e., 2 ×2). If each of 116 products is imported only from one country, the number is 116. As Table 3 show, within the treated lines, whereas the number changed little for REST (the rest of the world) and the number gradually increased for non-LDC GSP, the increase for the LDC is substantial. The number almost tripled over the years. These results indicate that the DFQF had a positive effect on the "extensive margin".

=== Table 3 ===

4. ECONOMETRIC ANALYSIS

This section contains a quantitative analysis of the same data used in the descriptive analysis of section 3. This is a case of the program evaluation in the econometrics literature. The program evaluation is usually expressed in the following equation.

$$E\left(Y_1 - Y_0 \middle| D=1\right) = E\left(Y_1 \middle| D=1\right) - E\left(Y_0 \middle| D=1\right)$$

The left-hand side is the Average Treatment effect on the Treated (ATT). The first term in the right-hand side is the mean value (import value in our study) for the countries or products selected; the rightmost term contains the mean value for the country or product as if it had not been selected. That is, the rightmost term is the counterfactual. The first term in the right-hand side is observable, but the second term is not. If $E\left(Y_0 \middle| D=1\right) = E\left(Y_0 \middle| D=0\right)$ holds, then ordinary least squares estimation will yield an unbiased estimate. If this equality does not hold, then endogeneity as a consequence of selection becomes a problem; this necessitates careful handling of endogeneity. However, a complete solution of the endogeneity issue is almost always a difficult task, due to unavailability of good

instrumental variables which satisfies various conditions for good IVs, such as high correlation with the variables to be instrumented or the exclusion restrictions.

Most program evaluation studies examine programs with endogenously given criteria, such as impact studies of preferential trade agreements. LDC status, however, is exogenously decided. Specifically, Japan did not choose which countries are eligible for the DFQF program. Japan is required to grant DFQF treatment to all LDCs. Tariff lines to be liberalised are also not selected. Thus, the DFQF system has the virtue of being almost free from the endogeneity issue. This makes OLS an appropriate estimation method for this study.

We apply the triple difference estimator (i.e., difference-in-difference-in-difference), as is done by Frazer and Van Biesebroeck (2010). The estimation model is:

$$\text{Im}\, portValue_{ijt} = \beta_0 + \beta_1 Ineffect_t * LDC_i * Treated\,\text{Pr}oduct_j + \tilde{\beta}_2 CountryPeriod_{it} + \tilde{\beta}_3\,\text{Pr}oductPeriod_{jt} + \tilde{\beta}_4 Country\,\text{Pr}oduct_{ij} + \varepsilon_{ijt}$$

For triple difference analysis, the time dimension (year) is collapsed into two periods: one for the years from 1996 to 2000; the other for the years from 2001 to 2014. This allows the analysis to fully exploit the exogenous nature of Japan's DFQF system since the zero tariffication was gradually done from 2001 onward. The variable of interest is the triple interaction term, $Ineffect_t * LDC_i * Treated\,\text{Pr}oduct_j$. Here, $Ineffect_t$ is a dummy variable which switches from 0 to 1 for all countries and products after 2001; LDC_i is a dummy variable which takes value 1 if the importer is an LDC country and 0 otherwise; $Treated\,\text{Pr}oduct_j$ is a dummy variable which takes value 1 for those products that are treated in the sense previously described and otherwise takes value 0.Three interactive fixed effects allow for (a) the base level of imports of any product from any country ($Country\,\text{Pr}oduct_{ij}$), (b) the overall imports from any country into Japan in any period($CountryPeriod_{it}$), and (c) the overall imports of any product into Japan in any period

($\mathrm{Pr}oductPeriod_{jt}$). There is no need to include uninteracted variables because those effects are absorbed into the three interactive fixed effects. The estimation result is in Table 4 The first column shows a statistically significant positive coefficient of 0.457, indicating that the DFQF initiative had positive impacts on LDCs' exports to Japan.

Because Japan is far from most LDC countries, the effect of Japan's DFQF system might be different between Asian LDCs and non-Asian LDCs, which are almost exclusively located in Sub-Saharan Africa. Thus, the estimation was performed with the Asian LDC dummy; results are shown in the second column of Table 4. The coefficient estimate for Asian LDC treatment is positive and statistically significant. The effect for Asian LDCs is more positive and statistically significant than the effect for LDCs without Asian countries. The total effect of the DFQF initiative for Asian LDCs is 0.231+0.397=0.628).

=== Table 4 ===

5. ROBUSTNESS CHECKS OF TRIPLE DIFFERENCE ESTIMATION

The result in Table 4 seems to square the prediction that the LDCs benefited from DFQF access to the Japanese market, especially Asian LDCs because of their geographical proximity. To check the robustness of the result in Table 4, we have performed the same triple difference estimation, with some changes in the time dimension (year) and tariff lines. First, different time periods from the above bench-mark triple difference estimator are taken. Now, the time is divided into the one for the years from 1996 to 2005 and the other for the years from 2006 to 2014 (column (i) of Table 5), as the DFQF initiative was agreed in December 2005. Second, MFN tariff lines which have zero tariff rates were dropped from the dataset. For products whose MFN tariffs are zero, there is no preference for LDCs (column (ii) of Table 5). Third, both changes, i.e., the newly defined time dimension (year) and the tariff lines excluding zero MFN rate goods are incorporated. (column (iii) of Table 5).

=== Table 5===

With the altered time period, the coefficient estimate for LDC treatment remains statistically significant and positive, but with a smaller magnitude (column (i) of Table 5). The coefficient estimate is now 0.160 while it is 0.457 in the benchmark case (Table 4). When we add Asian LDC treatment, the coefficient estimate for Asian LDC treatment is positive and statistically significant while the coefficient estimate for LDC treatment covariate turns insignificant. These results seem compatible with the descriptive analyses in Figure 4 and Figure 5, in which the positive impact of DFQF initiative seems to have taken place in 2001-2008 period, rather than the later period. Turning our eyes to products without zero MFNs, the estimation (ii), the estimation results are almost the same with the benchmark results in Table 4. Estimation (iii) shows similar results to those in (i).

6. CONCLUSION

This study evaluates the impact of the DFQF access given to LDCs by Japan. The construction of concordance tables and algorism for Japan's 9-digit tariff line codes for a 19-year period makes feasible an analysis at the tariff line level and thereby overcomes a possible aggregation bias. The exogenous nature of DFQF access alleviates potential endogeneity problems. We show that Japan granted the duty-free quota-free (DFQF) access to the LDC countries for all products by the year 2008. The triple difference estimator shows that LDCs, especially Asian LDCs, benefited from DFQF access to the Japanese market. Namely, tariff lines which were granted zero tariffs and substantial preference margins over other countries resulted in successful imports into the Japanese market. The effect is especially prominent for the pre-financial crisis period and for the Asian LDC countries. We conjecture that the stronger effect on the Asian LDC countries is attributable to other assistance of technical (trade procedures) or physical (infrastructures) by the Japanese government to the Asian countries, but are left to be investigated in future research.

REFERENCES

Baier, Scott L., Bergstrand, Jeffrey H., 2007. Do free trade agreements actually increase members'international trade?, Journal of International Economics 71 (2007) 72–95

Carrère, Céline., de Melo, Jaime., 2009.The Doha Round and Market Access for LDCs: Scenarios ffor the EU and US Markets, Working paper E 2009.11 CERDI

Egger, Hartmut., Egger, Peter., and Greenaway, David.,2008. The trade structure effects of endogenous regional trade agreements, Journal of International Economics 74 (2008) 278–298

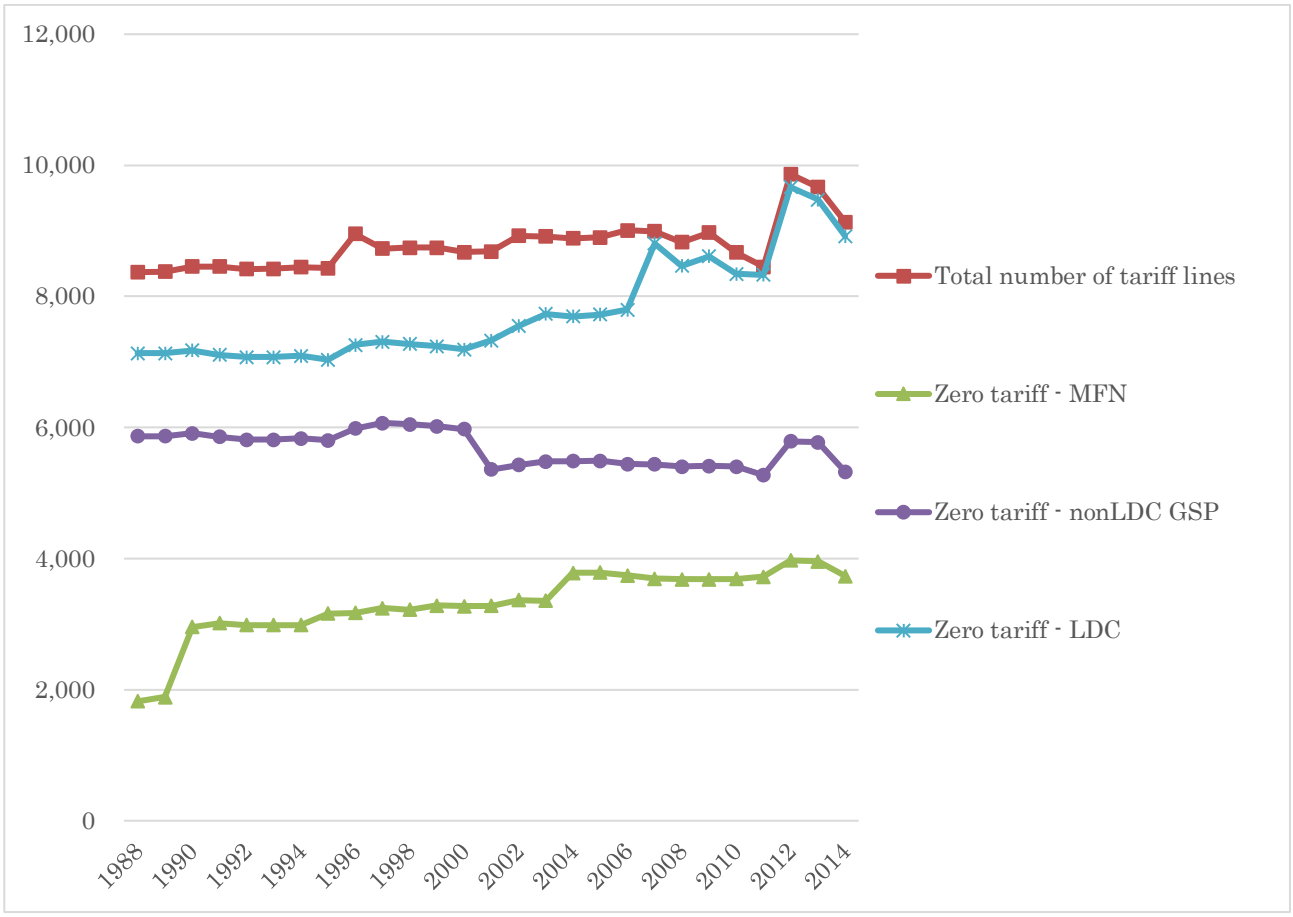
Frazer, Garth., Van Biesebroeck, Johannes., 2010. Trade and Growth Under the African Growth and Opportunity Act., The Review of Economics and Statistics, February 2010, 92(1): 128–144

Hoekman, Bernard., Ng, Francis., Olarreaga, Marcelo., 2002. Eliminating Excessive Tariffs on Exports of Least Developed Countries, World Bank Economic Review (2002) 16 (1): 1-21

Pierce, Justin R., and Schott, Peter K..2009, Concording U.S. Harmonized System Categories Over Time", NBER working paper 14837.

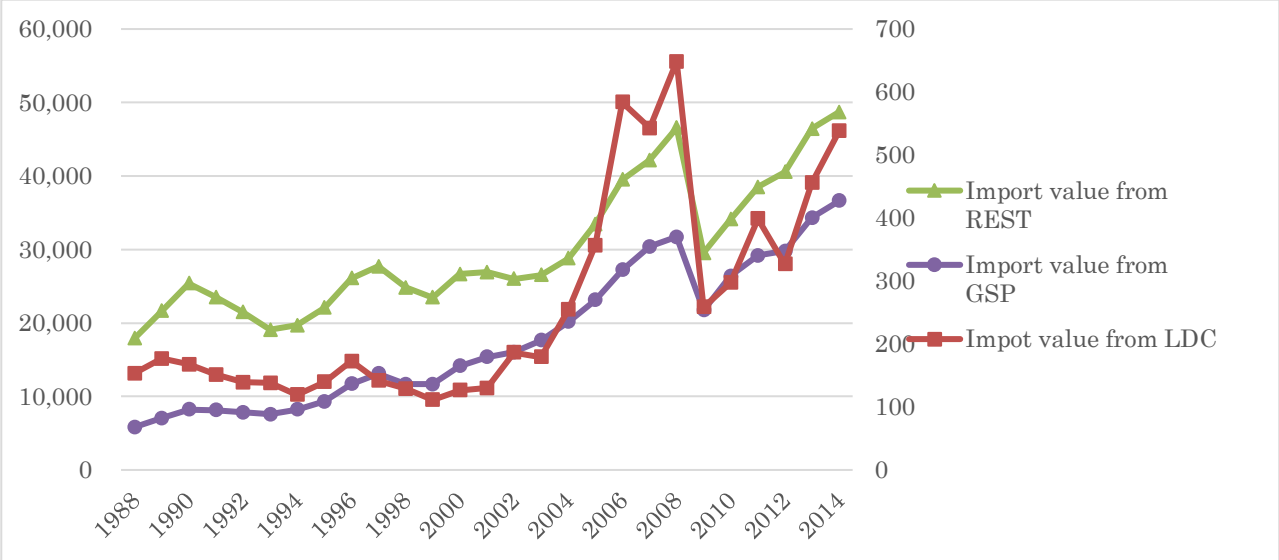
Low, Patcick., Piermartini, Roberta., Richtering, Jurgen. Non-Reciprocal Preference Erosion Arising From MFN Liberalitzation in Agriculture: What Are the Risks?, WTO Staff Working Paper ERSD-2006-02.

Figure 1: Number of zero tariff lines by year



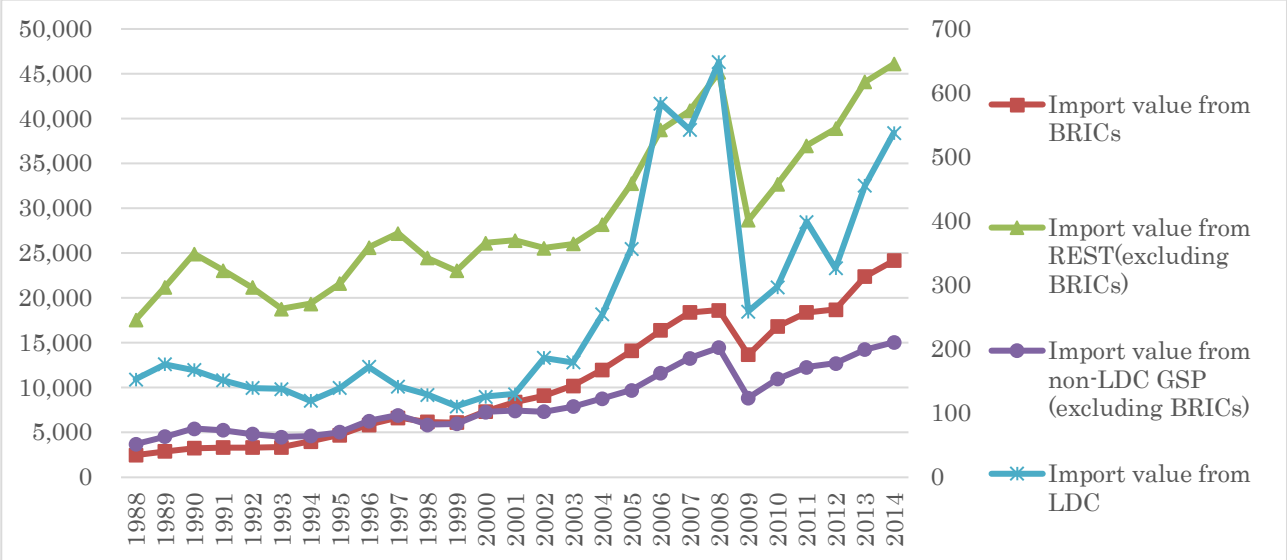
Source: Author's computation from tariff data.

Figure 2: Import value by country group and year



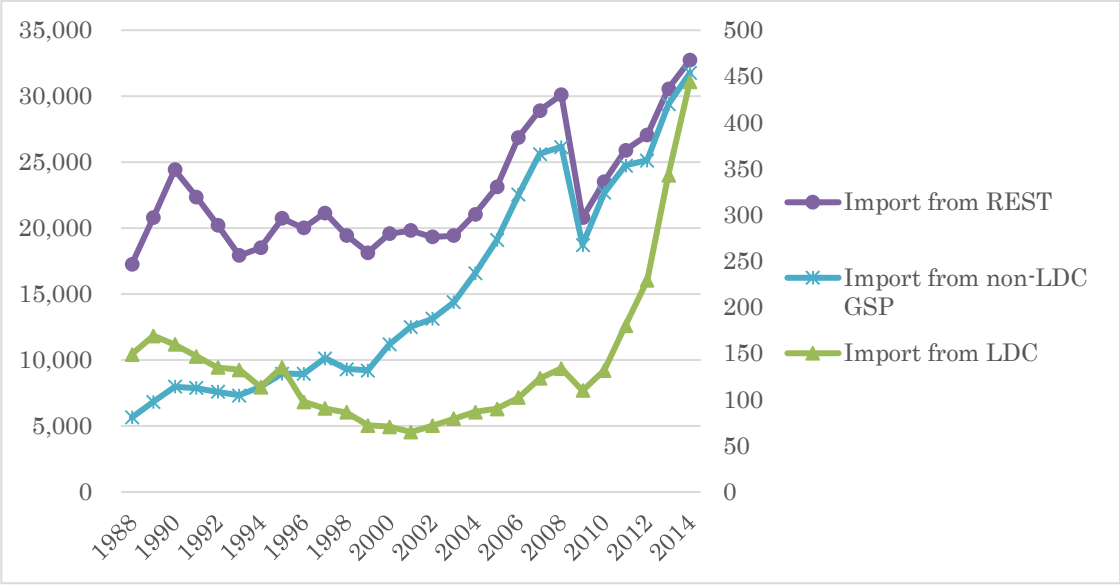
Source: Author's computation from tariff and trade data.

Figure 3: Import value by country group and year with BRICs separated



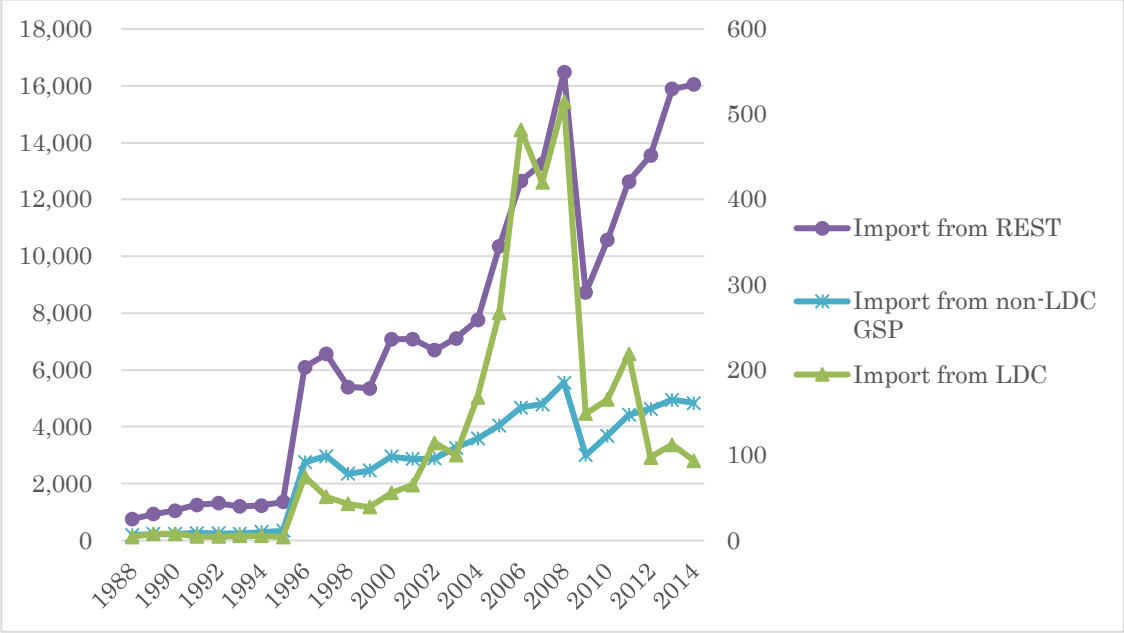
Source: Author's computation from tariff and trade data

Figure 4: Import value of non-treated group tariff lines, by country group



Source: Author's computation from tariff and trade data

Figure 5: Import value of treated group tariff lines, by country group



Source: Author's computation from tariff and trade data

Table 1: Number of tariff lines with more than 10% or20% preference margin

Total tariff Lines		
	Over MFN tariff	Over GSP tariff
Margin>20%	596	566
Margin>10%	1209	1081

Source: Author's computation from tariff data.

Table 2: Number of tariff lines with more than 10% preference margin, by industry

HS 2-digit code	HS 2-digit description	Number of tariff lines with preference margin of more than 10% over GSP tariff
20	Preparations of vegetables, fruit, nuts or other parts of plants.	152
61	Articles of apparel and clothing accessories, knitted or crocheted.	127
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included.	126
19	Preparations of cereals, flour, starch or milk; pastrycooks' products.	105
62	Articles of apparel and clothing accessories, not knitted or crocheted.	86
21	Miscellaneous edible preparations.	74
64	Footwear, gaiters and the like; parts of such articles,	64
11	Products of the milling industry; malt; starches; inulin; wheat gluten.	52
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates.	35
02	Meat and edible meat offal.	34
17	Sugars and sugar confectionery.	24
18	Cocoa and cocoa preparations.	24
50	Silk.	24
07	Edible vegetables and certain roots and tubers.	22
22	Beverages, spirits and vinegar.	20
41	Raw hides and skins (other than furskins) and leather.	19
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes.	16
08	Edible fruit and nuts; peel of citrus fruit or melons.	14
03	Fish and crustaceans, molluscs and other aquatic invertebrates.	11
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder.	8
09	Coffee, tea, mate and spices.	7
10	Cereals.	7
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut).	7
43	Furskins and artificial fur; manufactures thereof.	7
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags.	6
23	Residues and waste from the food industries; prepared animal fodder.	3
01	Live animals.	2
13	Lac; gums, resins and other vegetable saps and extracts.	2
24	Tobacco and manufactured tobacco substitutes.	2
25	Salt; sulphur; earths and stone; plastering materials, lime and cement.	1
44	Wood and articles of wood; wood charcoal,	1

Source: Author’s computation from tariff data.

Table 3: Number of tariff lines, with duplicates, imported into Japan

How many tariff lines were imported (running number)

	LDC		non-LDC GSP		REST	
years	Treated lines	Untreated lines	Treated lines	Untreated lines	Treated lines	Untreated lines
1996	56	477	1428	13317	3368	39291
1997	47	549	1450	14092	3392	39774
1998	59	568	1411	13803	3323	38951
1999	54	649	1481	14016	3311	38205
2000	62	689	1558	14882	3434	38996
2001	60	722	1643	15481	3517	39859
2002	66	737	1726	15678	3457	39798
2003	63	706	1741	16076	3470	39943
2004	61	779	1797	16667	3454	40426
2005	88	816	1945	17219	3461	40728
2006	72	851	1878	17507	3494	40754
2007	83	846	1870	17691	3402	40658
2008	90	869	1846	17686	3210	39379
2009	91	852	1789	16756	3092	36701
2010	95	894	1805	17011	3127	36850
2011	113	962	1822	17557	3192	37364
2012	104	1114	1898	17943	3256	37182
2013	130	1251	1937	18357	3356	38586
2014	141	1339	1966	18671	3415	38899

Source: Author’s computation from tariff data.

Table 4: Estimation result of triple difference

	(1)	(2)
lneffect_LDC_Treated	0.457***	0.231***
	(20.53)	(6.91)
lneffect_AsianLDC_Treated		0.397***
		(8.87)
Country period dummy	Yes	Yes
Product period dummy	Yes	Yes
Country product dummy	Yes	Yes
R-squared	0.894	0.894
Number of observations	1563745	1563745

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's computation from tariff data.

Table 5: Robustness check of triple difference analysis

	(i)		(ii)		(iii)	
	(1)	(2)	(3)	(4)	(5)	(6)
lneffect_LDC	0.160***	0.0446	0.469***	0.294***	0.117***	0.0497
treated	(6.91)	(1.29)	(21.55)	(9.02)	(5.17)	(1.47)
lneffect_AsianLDC		0.203***		0.302***		0.117**
treated		(4.37)		(6.91)		(2.57)
Country period dummy	Yes	Yes	Yes	Yes	Yes	Yes
Product period dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country product dummy	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.887	0.887	0.894	0.894	0.887	0.887
Number of observations	1563745	1563745	1128081	1128081	1127999	1127999

t statistics in parentheses

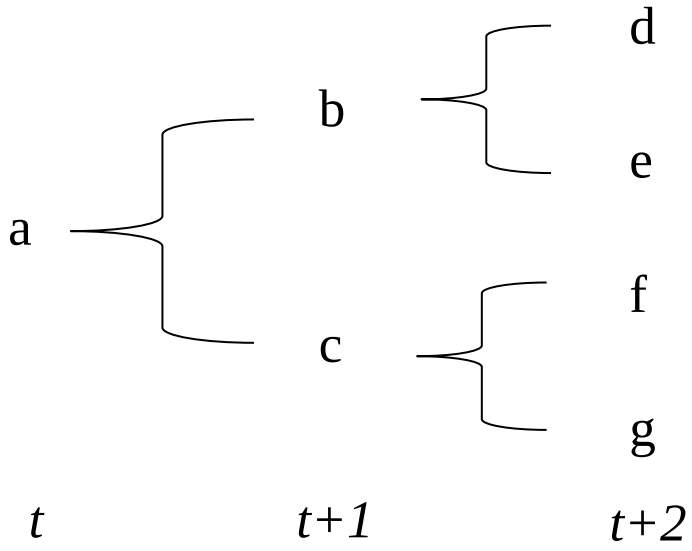
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's computation from tariff data.

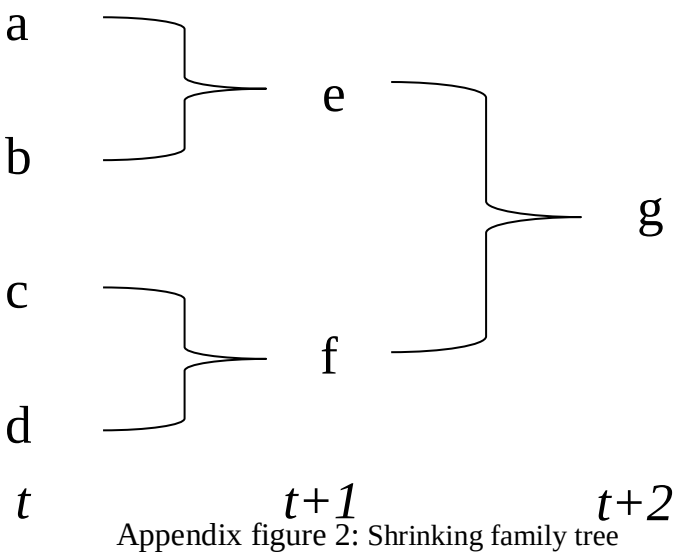
APPENDIX

9-digit code concordance

We need to track Japan's 9-digit tariff codes that change every year. Adjusting the concordance algorism originally proposed by Pierce and Schott (2009) for US tariff codes to our case of the Japanese HS codes, we have made concordance table over years. Pierce and Schott (2009) refers HS codes concordance relationship as "family trees", which can be described as the appendix figure 1 and 2 below.



Appendix figure 1: Growing family tree



Appendix figure 2: Shrinking family tree

As these figures illustrate, there are some codes which disappear and others which appear over years, which are called “obsolete” codes and “new” codes, respectively. In the case of the US, the US customs office prepares the obsolete-new tables over years. Our first task was to construct the obsolete-new tables for the Japanese case. Obsolete-new list for a single year is gone public by Japan customs, under the Ministry of Finance. But these Obsolete-new lists simply show which HS codes are generated (“new”) or which are deleted (obsolete). Therefore, we painstakingly checked HS codes one by one and made obsolete-new comparison tables over years.

While there are about 9000 HS 9-digit codes for each year before concordance, in the process of concordance, many codes are grouped into “code families”, and thus we are left with approximately 8000 tariff lines over 19 years (1996-2014) after the concordance, and there are about 1000 tariff lines in every year that are the candidate of concordance HS codes.

However, if we limit our analysis to periods within the same HS version, such as HS 2002, which covers 2002–2006, or HS 2007, which covers 2007–2011, substantially more than 8000 tariff line codes remain. Our investigation on the number of consistent tariff line codes between two subsequent years has shown that within the same HS version, the matching rate is about 99%; this rate drops to about 75-80% between years belonging to two different HS versions, such as 2001 and 2002. To strike a balance between the benefits and costs of concordance, this paper has made concordance tables between 1996 - 2014 (which uses HS concordance table from HS1996 to 2002, 2002 to 2006, 2006 to 2007, and Japanese 9 digit’s HS obsolete-new lists by every year). Among years within the same HS version, only the matched codes are kept.

More in-depth explanation for the algorism and procedures can be provided upon request to the authors.

List of LDC countries

Angola	Mali
Bangladesh	Mauritania
Benin	Mozambique
Bhutan	Myanmar
Burkina Faso	Nepal
Burundi	Niger
Cambodia	Rwanda
Central African Republic	Samoa
Chad	Sao Tome and Principe
Union of Comoros	Senegal
Democratic Republic of Congo	Sierra Leone
Djibouti Commonwealth of Dominica	Solomon Islands
Equatorial Guinea	Somalia
Eritrea	Sudan
Ethiopia	Tanzania
Gambia	Timor Leste
Guinea	Togo
Guinea-Bissau	Tuvalu
Haiti	Uganda
Kiribati	Vanuatu
Laos	Yemen
Lesotho	Zambia
Liberia	
Madagascar	
Malawi	

List of GSP beneficiary countries

Afghanistan
Albania
Algeria
American Samoa
Angola
Antigua and Barbuda
Argentina
Armenia
Azerbaijan
Bangladesh
Belarus
Belize
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
British Anguila
British Virgin Islands
Burkina Faso
Burundi
Cambodia
Cameroon
Canary Islands
Cape Verde
Central African Republic
Ceuta and Melilla
Chad
China (except for Hong Kong and Macao)
Chile
Colombia
Union of Comoros
Democratic Republic of Congo
Republic of Congo
Cook Islands
Costa Rica
Cuba
Croatia
Djibouti Commonwealth of Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Ethiopia
Falkland Islands and Dependencies
Fiji
Gabon
Gambia
Georgia
Ghana
Gibraltar
Grenada
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
India
Indonesia
Iran
Iraq
Côte d' Ivoire
Jamaica
Jordan
Kazakhstan
Kenya
Kiribati
Kyrgyz
Laos
Lebanon
Lesotho
Liberia
Libya
Macedonia (former Yugoslavia)
Madagascar
Malawi
Malaysia
Maldives
Mali
Marshall Islands
Mauritania
Mauritius
Mexico
Micronesia
Moldova
Mongolia
Montenegro
Montserrat
Morocco
Mozambique
Myanmar
Namibia
Nepal
Nicaragua
Niger
Nigeria
Niue
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Rwanda
Samoa
Sao Tome and Principe
Senegal
Serbia
Seychelles
Sierra Leone
Solomon Islands
Somalia
South Africa
Sri Lanka
St. Christopher and Nevis
St. Helena and Dependencies
St. Lucia
St. Vincent
Sudan
Suriname
Swaziland
Syria
Tajikistan
Tanzania
Thailand
Timor Leste
Togo
Tokelau Islands
Tonga
Tunisia
Turkey
Turkmenista
Turks and Caicos Islands
Tuvalu
Uganda
Ukraine
Uruguay
Uzbekistan
Vanuatu
Venezuela
Viet-Nam
West Bank and Gaza Strip
Yemen
Zambia
Zimbabwe

～Previous IDE Discussion Papers～

No.	Author(s)	Title	
433	Sato Kan Hiroshi	Toward an Inclusive and a Little Bit Ethical World Trading System: Listening to the Voices of the People in LDCs	2013
432	Ke DING	Platforms and Firm Capabilities: A Study of Emerging Global Value Chains	2013
431	Shawn ARITA and Kiyoyasu TANAKA	FDI and Investment Barriers in Developing Economies	2013
430	Toshihiro KUDO	Myanmar's Apparel Industry in the New International Environment: Prospects and Challenges	2013
429	Kazunobu HAYAKAWA and Nuttawut LAKSANAPANYAKUL	Impacts of Common Rules of Origin on FTA Utilization	2013
428	Kazunobu HAYAKAWA, HanSung KIM, Nuttawut LAKSANAPANYAKUL, and Kohei SHIINO	FTA Utilization: Certificate of Origin Data versus Customs Data	2013
427	Toshihiro KUDO, Satoru KUMAGAI and So UMEZAKI	Five Growth Strategies for Myanmar: Re-engagement with the Global Economy	2013
426	Koji KUBO	Myanmar’s Non-Resource Export Potential after the Lifting of Economic Sanctions: A Gravity Model Analysis	2013
425	Masayoshi OKABE	Where Does Philippine Education Go? The “K to 12” Program and Reform of Philippine Basic Education	2013
424	Bo MENG, Zhi WANG and Robert KOOPMAN	How Are Global Value Chains Fragmented and Extended in China’s Domestic Production Networks?	2013
423	Shinichi SHIGETOMI	Development and Institutionalization of Communitarian Thought in Thailand	2013
422	Takahiro FUKUNISHI	Political Crisis and Suspension of Duty-free Access in Madagascar: Assessment of Impacts on the Garment Industry	2013
421	Toshihiro KUDO, Satoru KUMAGAI and Hikari ISHIDO	Agriculture Plus Plus: Growth Strategy for Myanmar Agriculture	2013
420	Mai FUJITA	The Japanese and Chinese Models of Industrial Organisation: Fighting for Supremacy in the Vietnamese Motorcycle Industry	2013
419	Mai FUJITA	Exploring the Sources of China’s Challenge to Japan: Models of Industrial Organisation in the Motorcycle Industry	2013
418	Romio MORI, Kaoru NABESHIMA and Nanae YAMADA	Food Safety Control System of Chinese Eel Exports and its Challenges	2013
417	Takashi NOMURA, Saori OKADA, Takeshi YOSHIZAKI	Features of IP Rights Enforcement in Korea and China	2013
416	Yasushi UEKI	Supply Chain Collaboration and Responsiveness: A Comparison between Thai Automotive and Electronics Industries	2013
415	Yasushi UEKI	Formation of Supply Chain Collaboration and Firm Performance in the Thai Automotive and Electronics Industries	2013
414	Futaba ISHIZUKA	International Labor Migration in Vietnam and the Impact of Receiving Countries' Policies	2013
413	Chie KASHIWABARA	The Central Bank and Bank Credits in the Philippines: A Survey on Effectiveness of Monetary Policy and Its Measures	2013
412	Takahiro FUKUNISHI and Tatsufumi YAMAGATA	Slow and Steady Wins the Race: How the Garment Industry Leads Industrialization in Low-income Countries	2013
411	Tsuruyo FUNATSU	Changing Local Elite Selection in Thailand: Emergence of New Local Government Presidents after Direct Elections and Their Capabilities	2013
410	Hikari ISHIDO	Harmonization of Trade in Services by APEC members	2013
409	Koichi KAWAMURA	Presidentialism and Political Parties in Indonesia: Why Are All Parties Not Presidentialized?	2013
408	Emi KOJIN	The Development of Private Farms in Vietnam	2013
407	Tadayoshi TERAO	Political Economy of Low Sulfurization and Air Pollution Control Policy in Japan: SOx Emission Reduction by Fuel Conversion	2013
406	Miki HAMADA	Impact of Foreign Capital Entry in the Indonesian Banking Sector	2013
405	Maki AOKI-OKABE	Research Review: Searching for a New Framework for Thailand’s Foreign Policy in the Post-Cold War Era	2013
404	Yuka KODAMA	Relationship between Young Women and Parents in Rural Ethiopia	2013

No.	Author(s)	Title	
403	Yoshihiro HASHIGUCHI and Kiyoyasu TANAKA	Agglomeration and firm-level productivity: A Bayesian Spatial approach	2013
402	Hitoshi OTA	India's Senior Citizens' Policy and an Examination of the Life of Senior Citizens in North Delhi	2013
401	Mila KASHCHEEVA	Political limits on the World Oil Trade: Firm-level Evidence from US firms	2013
400	Takayuki HIGASHIKATA	Factor Decomposition of Income Inequality Change: Japan's Regional Income Disparity from 1955 to 1998	2013
399	Ikuo KUROIWA, Kenmei TSUBOTA	Economic Integration, Location of Industries, and Frontier Regions: Evidence from Cambodia	2013
398	Toshitaka GOKAN	The Location of Manufacturing Firms and Imperfect Information in Transport Market	2013
397	Junko MIZUNO	An Export Strategy and Technology Networks in the Republic of Korea	2013
396	Ke Ding, Toshitaka Gokan, Xiwei Zhu	Search, Matching and Self-Organization of a Marketplace	2013
395	Aya SUZUKI and VU Hoang Nam	Status and Constraints of Costly Port Rejection: A case from the Vietnamese Frozen Seafood Export Industry	2013
394	Natsuko OKA	A Note on Ethnic Return Migration Policy in Kazakhstan: Changing Priorities and a Growing Dilemma	2013
393	Norihiko YAMADA	Re-thinking of "Chintanakan Mai" (New Thinking): New Perspective for Understanding Lao PDR	2013
392	Yasushi HAZAMA	Economic Voting under a Predominant Party System	2013
391	Yasushi HAZAMA	Health Reform and Service Satisfaction in the Poor: Turkey	2013
390	Nanae YAMADA and Shuyan SUI	Response of Local Producers to Agro-food Port Rejection: The Case of Chinese Vegetable Exports	2013
389	Housam DARWISHEH	From Authoritarianism to Upheaval: the Political Economy of the Syrian Uprising and Regime Persistence	2013
388	Koji KUBO	Sources of Fluctuations in Parallel Exchange Rates and Policy Reform in Myanmar	2013
387	Masahiro KODAMA	Growth-Cycle Nexus	2013
386	Yutaka ARIMOTO, Seiro ITO, Yuya KUDO, Kazunari TSUKADA	Stigma, Social Relationship and HIV Testing in the Workplace: Evidence from South Africa	2013
385	Koichiro KIMURA	Outward FDI from Developing Countries: A Case of Chinese Firms in South Africa	2013
384	Chizuko SATO	Black Economic Empowerment in the South African Agricultural Sector: A Case Study of the Wine Industry	2013
383	Nudjarin RAMUNGUL, Etsuyo MICHIDA, Kaoru NABESHIMA	Impact of Product-related Environmental Regulations/Voluntary Requirements on Thai Firms	2013
382	Kazushi TAKAHASHI	Pro-poor Growth or Poverty Trap? : Estimating the Intergenerational Income Mobility in Rural Philippines	2013
381	Miwa TSUDA	Kenya after the 2007 "Post-Election Violence": Constitutional Reform and the National Accord and Reconciliation Act	2013
380	Kazuhiko OYAMADA	Parameterization of Applied General Equilibrium Models with Flexible Trade Specifications Based on the Armington, Krugman, and Melitz Models	2013
379	Yoshihiro NAKANISHI	Post-1988 Civil-Military Relations in Myanmar	2013
378	Tadashi ITO	Export Platform Foreign Direct Investment: Theory and Evidence	2012
377	Muhamad Takiyuddin Ismail, Ahmad Fauzi Abdul Hamid	The Misconception of Political Lessons: How UMNO Perceives the Fall of LDP in Japan	2012
376	Koji KUBO	Myanmar's Two Decades of Partial Transition to a Market Economy: A Negative Legacy for the New Government	2012
375	Bo MENG, Yaxiong ZHANG, Satoshi INOMATA	Compilation, Application and Challenge of IDE-JETRO's International Input-Output Tables	2012
374	Momoe MAKINO	What Motivates Female Operators to Enter the Garment Industry in Pakistan in the Post-MFA Period?	2012
373	Kenta GOTO	Is the Vietnamese Garment Industry at a Turning Point?: Upgrading from the Export to the Domestic Market	2012
372	Kazunobu HAYAKAWA	Impact of Diagonal Cumulation Rule on FTA Utilization: Evidence from Bilateral and Multilateral FTAs between Japan and Thailand	2012