Simple Measure of Preference Utilization: The Tariff Exemption Ratio

Kazunobu HAYAKAWA[#§]
Bangkok Research Center, Institute of Developing Economies, Thailand

Fukunari KIMURA
Faculty of Economics, Keio University, Japan

Nuttawut LAKSANAPANYAKUL
Science and Technology Development Program, Thailand Development Research Institute, Thailand

Abstract: We usually compute the preference utilization ratio, which is the share of imports under preference schemes in total imports, when investigating the extent of preference utilization vis-à-vis using tariff rates under the most-favored-nations principle. The crucial shortcoming of this measure is to require data on trade values classified by tariff schemes, which are not publicly available in most of the countries in the world. This paper proposes an alternative measure for preference utilization, which is named the "tariff exemption ratio". A unique advantage of this measure is that its computation requires the use of only publicly available data such as the data provided by the World Development Indicators. We can thus compute this measure for almost all countries in the world for comparison. Our finding is that it widely differs across countries and that its world average is approximately 50%.

Keywords: Preferential trade agreements; general system of preferences; Utilization of preferential arrangements; Tariff revenues

JEL Classification: F15; F53

1. Introduction

The most-favored-nations (MFN) principle is one of the central policy principles proposed by the GATT (General Agreement on Tariffs and Trade) and the WTO (World

[#] Corresponding author: Kazunobu Hayakawa; Address: Japan External Trade Organization, 16th Floor, Nantawan Building, 161 Rajadamri Road, Pathumwan, Bangkok 10330, Thailand; Tel: 66-2-253-6441; Fax: 66-2-254-1447; E-mail: kazunobu_hayakawa@ide-jetro.org.
[§] We would like to thank Tatsuo Hatta, Hiroshi Ohashi, Arata Kuno, and the seminar participants at Asian Growth Research Institute and JETRO Bangkok.

Trade Organization) and has been strictly implemented particularly for tariffs. The privilege of enjoying the MFN principle in member countries has effectively provided incentives for developing countries to participate in GATT or WTO. The tariff reduction under the WTO, however, has not well proceeded with huge difficulty in the Doha Development Agenda. As a result, many countries in the world, or we would say "most of the countries", start exploring "exceptions" of the MFN principle in terms of tariffs.

There are three major forms of exceptions for the MFN principle on tariffs. The first is regional trade agreements (RTAs) including free trade areas and customs unions. By the GATT Article XXIV, RTAs are accepted as exceptions for the MFN principle under loosely specified conditions. The number of RTAs has experienced an explosive increase since the 1990s. The second is the generalized system/scheme of preferences (GSP). Under the initiative of the UNCTAD (United Nations Conference on Trade and Development), GSP started in 1970 as another exception for the MFN principle in order for developed countries to grant preferential status for developing countries in their exports. The third includes various kinds of special trade arrangements in export processing zones, offshoring operations, duty-drawback system, and others.

For both academics and policymakers, it is important to quantify the extent of such preference utilization. We would like to know how far the actual trade practices deviate from the MFN principle. In addition, once RTAs or GSP is set up, we certainly would like to know how far the preferential scheme is actually utilized. The utilization of preferences under RTAs and GSP requires export products to meet rules of origin (RoOs). As a result, some exporters cannot comply with RoOs and thus may keep exporting under general tariff schemes such as MFN rates.

We have tried to measure the degree of preference utilization in various ways. A typical measure is the share of preference trade in total trade.[1] Several studies have reported such a ratio for various preferences: GSP granted by the European Union (EU) and the United States (US) to developing countries in the agri-goods sector (Bureau et al., 2007), preferences granted by the EU to non-least-developed African, Caribbean, and Pacific (ACP) countries under the Cotonou Agreement (Francois et al., 2006; Manchin, 2006), GSP granted by the US to 143 countries (Hakobyan, 2015), bilateral and multilateral RTAs when exporting from Thailand to Japan (Hayakawa, 2014), and RTA schemes in exporting from ASEAN to Korea (Hayakawa et al., 2014). For example, Hayakawa et al. (2014) show that, when exporting to Korea in 2011, the

[1] There are some variations in the measure of preference utilization. One issue is whether to exclude trade in products ineligible to preference schemes in the denominator or not. For more details, see Keck and Lendle (2012).

utilization ratio of ASEAN-Korea free trade agreement is 74% for Brunei, 63% for Indonesia, 67% for Cambodia, 44% for Lao PDR, 96% for Myanmar, 35% for Malaysia, 42% for Philippines, 35% for Thailand, and 78% for Viet Nam.

A crucial shortcoming of the preference utilization ratio is its difficulty in obtaining necessary data. Its computation requires data on trade values classified by tariff schemes such as RTA schemes, GSP schemes, or MFN schemes. Almost all countries except for the EU or the US do not publicly disclose such data. Or those are available only for limited purposes such as pure academic research. As a result, we did not know how far preferences are utilized in each country or how large differences in preference utilization across countries are.

This paper proposes a powerful alternative measure of preference utilization in each country's imports.[2] Importantly, its computation only requires publicly available data. Specifically, we employ the data of total government revenues from import duties. Such data are often used for computing the "tariff burden ratio", which can be a proxy for import duties and is computed by the total government revenues from import duties divided by total imports.[3] Our measure of preference utilization is (one minus) the share of "actual government revenues from import duties" in "the hypothetical total government revenues from import duties", the latter of which are the import-weighted average of MFN rates multiplied by total imports. Namely, it measures the share of exempted duties in total tariff revenues obtained if all imports were under MFN rates. Naturally, the utilization of RTA or GSP schemes raises the exempted duties. Also, if a country introduces other tariff exemption schemes such as duty drawbacks for re-exports, the magnitude of exempted duties becomes larger in that country. We call this measure the "tariff exemption ratio" and compute it by employing only the publicly available international databases, i.e., World Development Indicators (WDI) and OECD iLibrary. Thus, this measure can be calculated for almost all countries in the world for cross-country and time-series comparison.

Our tariff exemption ratio can be interpreted as a proxy for the extent of preference utilization in imports of products with positive MFN rates. By definition, the utilization of preference in products with zero MFN rates does not affect the tariff exemption ratio because it is based on how far import duties are exempted by importing under preferential rates compared with importing under MFN rates. Indeed, since we

[2] We focus on the import side because it is in general difficult to measure the preference utilization on the export side. For more details, see Hayakawa et al. (2013).

[3] Also, the revenue data are employed to examine the relationship between tax revenue and trade liberalization in some studies (Khattry and Rao, 2002; Agbeyegbe et al., 2006; Baunsgaard and Keen, 2010; Hisali, 2012).

can get access to necessary data in Thailand, we calculate both the preference utilization ratio and the tariff exemption ratio for comparison. As a result, we find that, when computing these ratios for products with positive MFN rates in Thailand, the values of those two ratios become almost identical. However, we also show that the tariff exemption ratio changes widely according to the data sources used for its computation.

Another important feature of our tariff exemption ratio is that it is affected by the magnitude of preferential rates and thus that of preference margin, i.e., the difference between preference rates and MFN rates. This is because the ratio is based on how far import duties are exempted by importing under preferential rates compared with importing under MFN rates. On the one hand, the preference utilization ratio identifies its utilization based only on whether or not *utilizing* preference schemes. The magnitude of preferential rates does not matter in the preference utilization ratio. After all, from the viewpoint of measuring the *utilization* of preference schemes, the preference utilization rate works better. On the other hand, the tariff exemption ratio is a better measure from the viewpoint of measuring the extent of giving tariff advantages to preference partners or how far preference partners enjoy tariff exemption. In this sense, these two measures will be complementary.

In addition, using our estimates of tariff exemption ratios in a large number of countries (112 countries), we examine the correlation with some elements. For example, since countries conducting large transactions with RTA partners are supposed to use the tariff exemption scheme more, the tariff exemption ratio should be positively correlated with the share of total intra-block imports. The tariff exemption ratio should also have a positive correlation with preference margins. The above-listed studies on the preference utilization ratio have consistently shown for the import by each *specific country* that the extent of preference utilization is positively associated with preference margins. Our result confirms that such positive relationship exists in a large number of countries.

The rest of this paper is organized as follows. The next section provides the specific definition of our tariff exemption ratio. In Section 3, employing the data on imports according to tariff schemes in Thailand, we examine the performance of this measure by comparing with the preference utilization ratio. Section 4 computes tariff exemption ratios for a large number of countries in the world. Section 5 examines the correlation of our tariff exemption ratio with some elements. Section 6 concludes.

2. The Tariff Exemption Ratio

We consider the utilization of preference in a country's total imports, not in its

imports from a specific country. When we measure the utilization of preference, the following measure is often employed (country subscript is omitted):

$$V \equiv \frac{\sum_i I_i^P}{\sum_i I_i^M + \sum_i I_i^P}, \tag{1}$$

where I_i^M and I_i^P are import values of product i under MFN schemes and preferential schemes, respectively. This measure is called the "preference utilization ratio" and shows the share of preferential imports in total imports. On the other hand, the measure we propose in this paper is called the "tariff exemption ratio" and is given by

$$E \equiv 1 - \frac{\sum_i t_i^M I_i^M + \sum_i t_i^P I_i^P}{\sum_i t_i^M (I_i^M + I_i^P)}, \tag{2}$$

where t_i^M and t_i^P are MFN tariff rates and preferential rates, respectively. While the numerator in the second term shows the total government revenues from import duties, the denominator indicates the MFN rates multiplied by total imports. In other words, the latter shows the total tariff revenues that would be obtained if all imports were under MFN rates, i.e. the hypothetical tariff revenues from the whole imports.

We can get the clearer intuition on the tariff exemption ratio by further simplifying the above formulation as follows:

$$E = \frac{\sum_i (t_i^M - t_i^P) I_i^P}{\sum_i t_i^M (I_i^M + I_i^P)} \tag{3}$$

The difference between MFN and preferential rates is called a "tariff margin" or a "preference margin". The numerator shows how far tariff revenues are lost by importing under preferential schemes. As a result, it measures the share of exempted duties in total potential tariff revenues.

This measure seems to be well related to the preference utilization ratio. Indeed, it is easily proven that E is completely equal to V if $t_i^P = 0$ and $t_i^M = t$ for all i. If MFN rates differ by products, the difference between these two measures becomes

$$E - V = \frac{\sum_i I_i^M \sum_i t_i^M I_i^P - \sum_i I_i^P \sum_i t_i^M I_i^M}{(\sum_i t_i^M I_i^M + \sum_i t_i^M I_i^P)(\sum_i I_i^M + \sum_i I_i^P)}. \tag{4}$$

The numerator becomes either positive or negative, depending on, for example, differences in MFN rates or imports across products. Also, if preferential rates are not zero, the difference between two measures emerges. This difference is due to the fact that the magnitude of tariff margin does not affect the preference utilization ratio but change the tariff exemption ratio, as shown in equation (3). In other words, contrast to the case of the tariff exemption ratio, the preference utilization ratio identifies its utilization based simply on whether or not utilizing preference schemes, regardless of preference margins.

Another important issue is on zero MFN rates. As is clear from equation (1), the inclusion of products with zero MFN rates in the computation of preference utilization ratio increases the imports under MFN rates in the denominator. It may also increase preferential imports particularly in the case of multilateral RTAs with cumulation rules because firms have incentive to import products under those RTA schemes even when those tariff rates are zero (notice that preferential rates are also zero for products with zero MFN rates), in order to enjoy cumulation rules (see, for example, Hayakawa et al., 2013). On the other hand, as is evident from equations (2) and (3), the inclusion of such products does not affect the level of tariff exemption ratio at all. Thus, the tariff exemption ratio should be interpreted as showing the extent of preference utilization only in imports of products with positive MFN rates. Therefore, when examining the time-series changes of tariff exemption ratio, we should take great care of the changes of products with zero MFN rates over time.

For later use, the tariff exemption ratio E multiplied by total imports of products with positive MFN rates is called exemption-basis preferential imports. The rest of the total imports of products with positive MFN rates are called exemption-basis non-preferential imports. On the other hand, I^M and I^P are called utilization-basis non-preferential imports and utilization-basis preferential imports, respectively. Obviously, exemption-basis preferential imports are not necessarily consistent with utilization-basis preferential imports.[4] While the former is the magnitude of preferential imports evaluated based on the magnitude of exempted tariff revenues, the latter is that evaluated based on whether or not preference schemes are utilized. Using these terms, we can say that our tariff exemption ratio is the share of exemption-basis preferential imports in total imports of products with positive MFN rates while the preferential utilization ratio is the share of utilization-basis preferential imports.

The tariff exemption ratio has a remarkable advantage in practice. The computation of the preference utilization ratio obviously requires the data on import values classified by tariff schemes. However, most of the countries in the world do not disclose such data. On the other hand, we can compute the tariff exemption ratio by employing only the publicly available data. The numerator in the second term in equation (2) is total government revenues from import duties. If we use the import-weighted average of MFN rates, the denominator becomes the weighted average of MFN rates multiplied by total imports. As a result, equation (2) can be rewritten as

[4] Suppose preferential imports of 100 USD. MFN and preferential rates are 10% and 4%, respectively. In this case, utilization-basis preferential imports are 100 USD. Since the tariff exemption ratio is 0.6 (= 1 − (4/10)), the exemption-basis preferential imports are 60 USD (= 0.6 * 100 USD).

follows.[5]

$$E = 1 - \frac{Total\ Revenues\ from\ Import\ Duties}{(Weighted\ Average\ of\ MFN\ Rates) \times (Total\ Imports)}. \quad (5)$$

The computation of the tariff exemption ratio requires only three sets of data: the weighted average of MFN rates, total revenues from import duties, and total imports. All of these three are available in public databases.

There are three points to be noted in applying equation (5). First, as mentioned before, the tariff exemption ratio measures the extent of preference utilization in imports of products with positive MFN rates. However, we can still use the data on total imports, not those on imports in products with positive MFN rates, as long as using the weighted average of MFN rates among *all* products. Indeed, total imports multiplied by the weighted average of MFN rates do not change depending on whether or not include the information for products with zero MFN rates. Second, unlike the preference utilization ratio, we cannot compute the tariff exemption ratio in a bilateral basis because the data on government revenues from import duties are not available by trading partners. It may also be impossible to compute it by products. Third, we cannot separately measure the utilization of individual preferential schemes including RTA schemes, GSP schemes, or various kinds of special trade arrangements (e.g., duty-drawback system). Our tariff exemption ratio measures the utilization of the whole preferential scheme.

3. Computation for Thailand

This section calculates the tariff exemption ratio in Thailand. First, in order to check its performance in terms of the similarity to the preference utilization ratio, we compute and compare these two measures. Next, we demonstrate that the computed tariff exemption ratio differs widely across data sources.

3.1. The Preference Utilization Ratio versus The Tariff Exemption Ratio

We examine the performance of the tariff exemption ratio by comparing it with the preference utilization ratio for Thailand since the data necessary for computing both are available in the case of Thailand. Specifically, we employ the dataset obtained from the Customs, Kingdom of Thailand. It is transaction-level import data from 2007 to 2011 and covers all commodity imports in Thailand. Commodities are classified at a harmonized system (HS) eight-digit level. When computing the preference utilization

[5] For more details on the equivalence between equations (2) and (5), see Appendix A.

ratio, we use the information on imports according to tariff schemes including MFN rates, RTA schemes, and other schemes. Other schemes include duty free schemes such as investment promotion or duty drawbacks for re-exports. Thus, we classify imports under the latter two kinds of schemes as preferential imports. When computing the tariff exemption ratio, we directly calculate total revenues from import duties by employing the above-mentioned import data according to tariff schemes in addition to the data on tariff rates from the Customs. We can obtain the weighted-average of MFN rates by dividing the hypothetical revenues from import duties by total imports. Such MFN rates are equivalent to weighted-average of MFN rates computed by using the HS eight-digit level imports and MFN rates.

Two ratios in Thailand are reported in Table 1. The upper panel shows those for all products including products with zero MFN rates. Columns (I)-(III) report import values according to three tariff schemes. Column (IV) shows the sum of those. From the figures in these four columns, we can compute the preference utilization ratio, which is reported in column (VIII). It lies in a range of 38% to 44%. The import-weighted average of MFN rates is shown in column (V). While the actual government revenues from import duties are reported in column (VI), the hypothetical tariff revenues from total imports, which are obtained by multiplying figures in column (IV) by those in column (V), are shown in column (VII). As a result, the tariff exemption ratio is reported in column (IX) and lies in a range of 49% to 58%. We can see in the case of all products that the tariff exemption ratio is around 10% point higher than the preference utilization ratio.

=== Table 1 ===

The case of excluding products with zero MFN rates is shown in the lower panel of Table 1. As mentioned in the previous section, the tariff exemption ratio and actual/hypothetical tariff revenues do not change. On the other hand, import values in each tariff scheme naturally decrease. Also, the weighted average of MFN rates rises though we here do not use it. As a result, the preference utilization ratio rises and lies in a range of 45% to 56%. Surprisingly, these levels of the preference utilization ratio are almost same as those of the tariff exemption ratio. The difference between these two kinds of ratios is at most four percent. Except for the case of 2007, it is only zero to two percent. Thus, at least in the case of Thailand, the tariff exemption ratio is a highly good indicator for measuring the extent of preference utilization.

3.2. Sensitivity to Data Sources

In the case of Thailand, we get access to the Customs data so that the complete set of disaggregated trade data can make the calculation of tariff exemption ratio clean and precise. However, in applying this method to other countries, we have to depend on publicly available aggregated figures. In this subsection, we examine how far differences in data sources affect the estimated values of tariff exemption ratios.

The results are reported in Table 2. For comparison, we reshow figures in "All Products" and "Positive MFN Products" in Table 1, in cases (i) and (ii), respectively. In case (iii), we compute the tariff exemption ratio for Thailand by employing the data derived only from WDI[6]. Specifically, we obtain the data on "Customs and other import duties"[7], "Goods imports", and "Tariff rate, most favored nation, weighted mean, all products". The original source for the data on customs and other import duties is the Government Finance Statistics (GFS) by International Monetary Fund (IMF). The original sources for imports and MFN rates are International Financial Statistics (IFS) by IMF and World Integrated Trade Solution (WITS) database, respectively. In case (iv), we employ import data obtained from UN Comtrade and the WDI data for MFN rates and tariff revenues.

=== Table 2 ===

Since the WDI/Comtrade data are based on those for all products, we should compare figures of imports, MFN rates, and tariff revenues in cases (iii) and (iv) with those in case (i). Compared with figures derived from the Customs data, the values of imports are larger in Comtrade and smaller in WDI (i.e., IFS). There are various reasons for such differences in total imports. For example, according to the IMF website, figures for total imports are not necessarily same between IFS and UN Comtrade since those are based on different data collection systems with different aims, procedures, timetable, and sources for update and maintenance. These differences result in yielding some gap in total imports across data sources.

The weighted average of MFN rates is a little higher in WDI (i.e., WITS). The main source of this difference may be a difference in the aggregation level. In the case

[6] In this table, we restrict sample years only to 2007-2009 since the data for Thailand in the WDI are not available for 2010 and 2011.

[7] The metadata in the WDI refers that "Customs and other import duties are all levies collected on goods that are entering the country or services delivered by nonresidents to residents. They include levies imposed for revenue or protection purposes and determined on a specific or ad valorem basis as long as they are restricted to imported goods or services."

of WDI data, according to the metadata in the WDI, tariff rates and the imports used for weight are first separately aggregated to a standard international trade classification (SITC) five-digit level. Then, the weighted average of MFN rates is computed. On the other hand, as mentioned above, our MFN rates are computed by employing HS eight-digit level data of imports and MFN rates. Another source of the difference may be that we employ tariff equivalent rates for specific rates in the case of Customs data though it is unclear whether or not the WDI data do so.

The revenues from import duties are smaller in WDI (i.e., GFS). As mentioned in the next section, there are several kinds of limitation in the revenue data. In addition, when we directly compute tariff revenues by multiplying imports by MFN rates, our use of tariff equivalent rates for specific duties may lead to the gap with the case of WDI data. Another issue is that the original source of WDI data for both imports and tariff revenues is the estimates by IMF. Thus, in the case of WDI data, smaller values of tariff revenues are consistent with those of imports. In other words, other things being equal, smaller imports lead automatically to smaller tariff revenues. In this sense, as shown just below, the gap in imports and tariff revenues between WDI and Customs may not yield a large difference in the tariff exemption ratio between those two sources.

As mentioned in the previous subsection, the tariff exemption ratio should be interpreted as showing the extent of preference utilization in imports of only products with positive MFN rates. Thus, the tariff exemption ratio computed using the WDI/Comtrade data should be compared with the preference utilization ratio and the tariff exemption ratio in case (ii). The tariff exemption ratio in case (iii) is around 10% point higher than the preference utilization ratio and the tariff exemption ratio in case (ii). The ratio in case (iv) is around 15% point higher. Thus, the tariff exemption ratio based on WDI/Comtrade data overestimates the extent of preference utilization. In other words, the level of tariff exemption ratio is dependent upon the data sources used in computation. As mentioned above, furthermore, the lesser degree of overestimation in case (iii) may be due to the use of WDI data for imports and tariff revenues, both of which are the estimates by IMF. Thus, we should avoid the mix of data sources when computing the tariff exemption ratio.

4. The Tariff Exemption Ratio in the World

This section presents the tariff exemption ratio for almost all countries in the world. First, we introduce the ratio computed by employing only the data on the publicly well-known databases. Next, to improve its accuracy, we compute it by

employing another data source on the weighted average of MFN rates.

4.1. Use of WDI Database

In this subsection, we employ two databases to compute tariff exemption ratios. One is the WDI. The specific variables obtained from WDI are same as those for Thailand in the previous subsection: “Customs and other import duties”, “Goods imports”, and “Tariff rate, most favored nation, weighted mean, all products”. The other is OECD iLibrary. Since the data on customs and other import duties are missing for most of the European countries in the WDI, we employ another publicly available database, OECD iLibrary, even though it is better not to mix data sources as we mentioned above. We employ data on customs and other import duties in the OECD iLibrary for all OECD countries. Specifically, we use the data on “5123 Customs and import duties” and “Custom duties collected for the EU” in Revenue Statistics in OECD Tax Statistics. Since we employ the latest data available in each country, the sample year differs by countries.

There are some shortcomings in the data of customs and other import duties. First, while many countries report figures of these customs duties by fiscal year, the other data such as import data are reported by calendar year. In this sense, some gaps in values will exist between these two kinds of data. Second, if the duty paid in a year is refunded in the next year, the tariff exemption ratio does not necessarily indicate the use of preference in that year. Third, some countries do not report the central and local government finance data consolidated into one account and present only budgetary central government accounts. In the case of customs and other import duties, even budgetary central government accounts will show their whole picture, but we will later take a little care of this issue. Due to these various noises, the tariff exemption ratio becomes too large or negative for a few countries. We drop countries with those ratios (i.e., greater than 1.05 or negative). We set 1 if the ratio lies in the range of 1 to 1.05.

We compute the tariff exemption ratio for 112 countries. The ratio for each country is shown in column “WDI” in Table 3. We report sample year, tariff exemption ratio, and the weighted average of MFN rates. We can see that countries with one-valued ratios are small countries in the EU. If those countries import goods only from members of EU, the tariff exemption ratio may take the value one. However, such use of preferences would be rare. Rather, the one-valued ratio would come because of above-mentioned minor errors in tariff revenues. In any case, those countries do have tariff exemption ratios close to the value one. On the other hand, countries with zero are small island countries. Contrast to the one-valued cases, zero-valued ratios are likely to

happen. For example, some countries may not offer any preferential schemes to exporters. In this case, the tariff exemption ratio is always zero.[8]

=== Table 3 ===

The basic statistics for tariff exemption ratios in the world are provided in Table 4. Its sample mean is 0.54 while its standard deviation is 0.32.[9] In the table, the ratios are also shown by regions. In terms of simple means, Europe has the highest ratio, followed by East or Southeast Asia and North America. In the 2000s, ASEAN member states formed regional agreements with major trading partners, i.e., Australia, China, India, Japan, Korea, and New Zealand. Korea also actively concludes RTAs with her major trading partners including not only Asian countries but also the U.S. and European countries. These active formations of RTAs lead to high tariff exemption ratios in East or Southeast Asia. On the other hand, Africa, South or West Asia, and Pacific have relatively small means of tariff exemption ratios. In these regions, preference schemes are not much utilized in trading. In particular, among Pacific countries, Australia and Vanuatu have low ratios though New Zealand has a relatively high ratio.

=== Table 4 ===

In the lower panel of Table 4, we report the basic statistics by major RTAs, including ASEAN Free Trade Area (AFTA), Common Market for Eastern and Southern Africa (COMESA), EU, Mercado Común del Sur (MERCOSUR), South Asian Free Trade Area (SAFTA), and North American Free Trade Agreement (NAFTA).[10] We

[8] Using figures for preference utilization ratio in Keck and Lendle (2012), we can check the differences in some countries between our tariff exemption ratio and the preference utilization ratio. Specifically, Table 1 in Keck and Lendle (2012) shows import values according to tariff schemes and MFN rates in Australia, Canada, and the U.S. (and EU) in 2008. The preference utilization ratio for products with positive MFN rates is 30% in Australia, 78% in Canada, and 45% in the U.S. On the other hand, tariff exemption ratios in 2008 are 20% in Australia, 75% in Canada, and 56% in the U.S. Therefore, while the difference between two measures is small in Canada, there is approximately 10% difference in Australia and the U.S.

[9] In order to minimize the errors from the use of data in specific years, we also compute tariff exemption ratios by employing the latest three-year average of each variable. Since the data are available for only one or two years in some countries, the number of countries for which we can compute the ratio is decreased to 71 countries. We also compute the statistics for the same set of countries employing the data of single latest year. As a result, the mean values are almost same between these two cases (0.59 for three-year average or 0.58 for single year), though the case of three-year average (0.32) shows the smaller standard deviation than the case of single year (0.34).

[10] EU includes Austria, Bulgaria, Cyprus, Croatia, Czech Republic, Finland, France, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Poland, Portugal, Romania, Slovak Republic,

identify member countries as of 2014 though sample years in some countries may be years before joining RTAs. It is noted that the statistics in an RTA do not show those in imports among the members of that RTA but present those in their total imports. From this panel, we can see that EU has the highest means of tariff exemption ratios (96%), followed by AFTA and NAFTA, both of which have around 65%. As is found in Table 1 (i.e., the case of Thailand), the utilization of not only RTA schemes but also other tariff exemption schemes such as duty drawbacks for re-exports leads to high ratios in AFTA. COMESA, MERCOSUR, and SAFTA have approximately 40% as means of tariff exemption ratios.

4.2. Use of WITS Database

In the previous section, we pointed out that the way of the weighted average of MFN rates affects estimates of tariff exemption ratios. In particular, its data from WDI are computed by aggregating import and tariff data at an SITC five-digit level. We can improve this data by employing the data from the World Integrated Trade Solutions (WITS[11]), which provides the data aggregated by using each country's tariff line level data.[12] However, countries in which the data are available in the WITS are limited compared with the case of WDI. As a result, we compute it for 83 countries. The results are shown in column "WITS" in Table 3. Again, we report sample year, tariff exemption ratio, and the weighted average of MFN rates. We can see both cases of overestimation and underestimation on the weighted average of MFN rates and thus on tariff exemption ratios. On average, the difference in tariff exemption ratios between cases of WDI and WITS is just 3%.[13]

Using this improved measure, we also examine time-series changes in tariff exemption ratios. The ratios for selected countries during 2005-2012 are depicted in Figure 1. These countries are selected based on not only the data availability[14] but also

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Slovenia, Spain, Sweden, and United Kingdom. MERCOSUR includes Brazil, Paraguay, Uruguay, and Venezuela. AFTA includes Cambodia, Indonesia, Lao PDR, Malaysia, Singapore, and Thailand. NAFTA includes Canada, Mexico, and United States. COMESA includes Congo, Dem. Rep., Egypt, Arab Rep., Kenya, Mauritius, Rwanda, Seychelles, Uganda, and Zambia. SAFTA includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

[11] This database is also publicly and freely available after registration.

[12] As mentioned in the previous section, the original source of tariff data in WDI is also WITS, but those data in WDI are constructed by aggregating at an SITC five-digit level.

[13] Some more basic statistics on the difference in tariff exemption ratios between cases of WDI and WITS are available in Table B1 in Appendix B.

[14] In particular, the WDI database provides the data on imports only since 2005. Thus, if we employ other data sources such as UN Comtrade, we can extend sample years for figures. For some countries, we can compute the tariff exemption ratio up to 1988, since which the data on weighted average of MFN rates have been available in the WDI. In this paper, to keep consistency in data

the significance of economy sizes, geographical diversity, and the prevalence of RTAs. Also, except for South Africa, these countries do not significantly change the share of products with zero MFN rates.[15] Remember that our tariff exemption ratios measure the preference utilization in products with positive MFN rates. Therefore, the time-series changes of tariff exemption ratios in these countries can be seen as those of preference utilization rather than those of a set of products with positive MFN rates.[16] As for other countries, for example, countries with tariff exemption ratios equal to or near the value one in Table 3, i.e., European countries, have similar levels also for other years.

=== Figure 1 ===

The figure shows various interesting changes. Tariff exemption ratio in the U.S. changes over time in a range of 0.3 to 0.5. While tariff exemption ratios in Chile and Norway are growing, those in China and Brazil are gradually decreasing. In particular, the rise in Chile is significant and is consistent with the fact that Chile is actively increasing the number of RTA partners during the sample period. In the cases of Australia and Japan, the ratios stay at a low level. The ratio in South Africa is unstable partly because of the change in a set of products over time. In South Africa, the share of products with zero MFN rates changes over time. Such a change significantly affects values of tariff exemption ratios. In addition, we may doubt the accuracy of data on tariff revenues in South Africa.

The WITS database provides the data on the share of imports of products with zero MFN rates, i.e., duty free imports, in total imports. We name this share "Free". Combining this information with tariff exemption ratios, we can show figures on the *quasi*-decomposition of total imports. Namely, multiplying "one minus Free" by the tariff exemption ratio, we obtain the share of exemption-basis preferential imports in total imports. We name this share "Exempted". As a result, one minus "Free plus Exempted" indicates the share of exemption-basis non-preferential imports in total imports, which is named "Non-exempted". Importantly, as discussed so far, Exempted is not exactly same as the share of actual preferential imports (i.e., utilization-basis preferential imports) in total imports, particularly when preferential tariffs are not zero

sources with other tables and figures, we do not mix the data sources on imports to draw figures for such a longer period but show those since 2005.

[15] Table B2 in Appendix B reports the share of products with zero MFN rates in these countries.

[16] Also, tariff exemption ratios are likely to change from 2006 to 2007 or from 2011 to 2012 due to a change in HS versions, i.e., from HS2002 to HS2007 or from HS2007 to HS2012. In general, the changes of tariff-line structures affect aggregated values of MFN rates. Thus, a change in weighted averages of MFN rates through a change of HS versions will affect tariff exemption ratios.

or when multilateral RTAs with cumulation rules are available. Nevertheless, this decomposition of total imports presents invaluable information.

The results are depicted in Figure 2. For reference, we also show the share of the tariff line-level products with zero MFN rates in total, of which data are obtained from the WITS. This figure tells that, for example, in the U.S., forty percent of total imports are duty free imports, twenty percent are exemption-basis preferential imports, and forty percent are exemption-basis non-preferential imports. It also shows that, in Norway, while tariff exemption ratio (WITS) is around fifty percent as reported in Table 3, ninety percent of total imports are already imported under duty free. In contrast, most of total imports in Chile are exemption-basis preferential imports. The magnitude of duty free imports in Chile is trivial. In short, this figure is useful to learn the composition of various types of imports in terms of tariff schemes.

=== Figure 2 ===

5. Correlation with Some Elements

This section examines the correlation of tariff exemption ratios with some elements. For this analysis, we use tariff exemption ratios in column "WDI" in Table 3, in order to capture a wider variation among a larger number of countries.[17] We try several kinds of variables, of which the basic statistics are listed in Table 5. We first regress tariff exemption ratios on the share of imports from RTA member countries in total imports (*Preference share*: *RTA*) by ordinary least squares (OLS).[18][19] It is natural that, other things being equal, the higher the share of imports from RTA members, the higher the tariff exemption ratio. The information on RTA membership is obtained from the regional trade agreement database in the WTO website. The bilateral trade data are from UN Comtrade. The result is reported in column (I) in Table 6 and shows a significantly positive coefficient for this variable. The magnitude of this coefficient, i.e., 0.756, might be interpreted as indicating the world average rates of RTA utilization

[17] The estimation results using tariff exemption ratios in column "WITS" are reported in Table B3 in Appendix B.

[18] For simplicity in interpretation on marginal effects, we report only OLS results. However, the statistical significance of coefficients in all estimation is not changed even if we estimate all models by the fractional-logit model, which is a more suitable estimation technique for models in which the dependent variable lies in unit interval [0, 1]. The results are reported in Table B3 in Appendix B.

[19] Obviously, RTA schemes cannot necessarily be applied to all products when trading even among RTA member countries. However, for simplicity in computation, we use total imports from RTA member countries for the numerator.

when it is possible to import under RTA schemes, though 76% of RTA utilization rates looks too high.

=== Tables 5 and 6 ===

Second, we add the export intensity, which is defined as the ratio of total exports to GDP, into the estimation equation. As in the above case of Thailand, some countries, particularly developing countries, refund the duties for imports if those imports are used for producing products for export. Thus, it is natural that countries getting engaged actively in such a type of trade have higher tariff exemption ratios. However, since it is empirically difficult to precisely measure the extent of such trade, we use the export intensity as a proxy for that. The result is reported in column (II). The coefficients for both Preference share and Export intensity are estimated to be significantly positive. The magnitude of the former coefficient is a little reduced to 0.693. The latter result indicates that the tariff exemption ratio is higher in export-intensive countries.

Third, we introduce the share of imports from GSP beneficiaries in total imports (*Preference share*: *GSP*). The information on GSP beneficiaries is obtained from the preferential trade agreement database in WTO website. The results are reported in columns (III) and (IV). The coefficients for both the preference share from RTA members and the export intensity are again estimated to be significantly positive. The magnitude of the former coefficient is further reduced. The coefficients for the preference share from GSP beneficiaries are estimated to be positively significant. Although its coefficient may be again interpreted as indicating the world average rates of GSP utilization, its magnitude is more than 0.9. As shown in Table 8 in Keck and Lendle (2012), the utilization ratio of GSP in importing from its beneficiaries is consistently high in Australia, Canada, EU, and the U.S. Several cases show more than 90% of utilization ratios. Nevertheless, more than 90% of GSP utilization ratio might be too high as its world average.

We further examine the correlation with tariff exemption ratios. Following the literature on the determinants of RTA utilization rates, of which studies are listed in the introductory section, we first examine the role of preference margin, i.e., the difference between preference rates and MFN rates. It is well known that the RTA schemes are more likely to be utilized when the preference margins are larger. As a proxy for this variable, we work with a difference between simple averages of applied tariff rates and MFN rates. The data on both kinds of tariff rates are obtained from WDI. Since the former kind of tariff data in WDI is constructed based on not only MFN rates but also

preferential rates, this variable will be well related to preference margins. The results are shown in column (I) in Table 7. As is consistent with the above expectation, we find a positively significant coefficient for this new variable. Specifically, the 1% point larger preference margin leads to the 2.6% point larger ratio of tariff exemption.

=== Table 7 ===

Second, we also examine the correlation of economic development by introducing GDP per capita. The results are shown in column (II) in Table 7. The coefficient for preference margin is again estimated to be significantly positive while the coefficient for GDP per capita is insignificant. The latter result implies that the tariff exemption ratio is not necessarily correlated with development stages. There are several possible reasons for this insignificant result. On the one hand, GSP schemes are basically available when exporting to developed countries. This unilateral preference schemes will raise tariff exemption ratios in developed countries. On the other hand, tariff exemption schemes other than RTAs and GSP, of which examples include investment promotion or duty drawbacks for re-exports, are likely to be introduced in developing countries in order to attract more foreign investment or to obtain a larger amount of foreign currencies. As a result, these two opposite forces may yield the insignificant result in GDP per capita.

Last, we again examine the correlation with these two elements under controlling for some noises in tariff exemption ratios. As is found in equation (4), variation in MFN rates and imports across products leads to yielding a gap between the tariff exemption ratio and the preferential utilization ratio. Thus, we introduce the following two variables to control for those differences. One is a difference between weighted average of MFN rates and simple average of MFN rates (*Weighted-Simple MFN difference*), which can be a proxy for the variation in imports across products. The other is the share of products with MFN rates greater than 15% (*Share of high MFN products*), which is partly related to differences in MFN rates across products. Furthermore, we introduce shares of products with specific MFN rates (*Share of specific tariff products*). As is mentioned above, the existence of specific rates affects the degree of precision in the weighted average of MFN rates and thus in tariff exemption ratios. All these three variables are derived from WDI.

We further introduce some more elements. In the previous section, we pointed out the role of unilateral trade liberalization in time-series changes in tariff exemption ratios. Although our exercise in this section is a cross-country analysis, not the time-series

analysis, it may also affect the absolute magnitude of tariff exemption ratios. To control this effect, we introduce the share of products with zero MFN rates (*Share of zero MFN products*), of which data are obtained from UNCTAD stat. Unfortunately, due to the data limitation, such a share can be computed only for manufactured goods, ores and metals (SITC (Rev. 3): 5 + 6 + 7 + 8 + 27 + 28 – 667).[20] We also introduce a dummy variable taking the value one if the government finance data in a country are those consolidated into one account and the value zero otherwise (*Consolidated dummy*). The information for this variable can be derived from the metadata of WDI.

The results are reported in column (III). The results in the previous variables are qualitatively unchanged. Namely, except for GDP per capita, preference shares of RTA and GSP, export intensity, and preference margin have positively significant coefficients. In particular, the 1% point larger preference margin leads to the 4.7% point larger ratio of tariff exemption. Coefficients for the weighted-simple MFN difference and the share of high MFN products are estimated to be significantly positive, indicating that these variables contribute to correcting our tariff exemption ratio. On the other hand, the share of specific tariff products, the share of products with zero MFN rates, and the consolidated dummy have insignificant coefficients and thus do not affect the cross-country differences in our tariff exemption ratio.[21]

6. Concluding Remarks

In this paper, we proposed a new indicator that measures the extent of preference utilization. Contrast to the usually-employed measure, i.e., the preference utilization ratio, our new measure called the tariff exemption ratio can be computed by employing only publicly available databases such as WDI. We first demonstrated using the detailed data in Thailand that our measure is a highly good indicator for measuring the extent of preference utilization for trading products with positive MFN rates. Second, we also

[20] The data on this variable are missing for Japan and Israel for the year corresponding to that in tariff exemption ratio (2012). Thus, we use the share of zero MFN products in 2011 for Japan and in 2009 for Israel. In addition, when we restrict sample countries to those in which the WITS data are available, namely, when we examine tariff exemption ratios in column "WITS" in Table 3, we can use the data on *Share of zero MFN products* in all goods including agricultural goods, as shown in Figure 2. The results are reported in Table B3 in Appendix B.

[21] As reported in Table B3 in Appendix B, the results on our main variables are qualitatively unchanged even if employing the fractional logit model. However, those are changed when estimating for tariff exemption ratios in "WITS" in Table 3. Specifically, the coefficients for "Preference share: GSP", "Export intensity", and "Share of high MFN products" turn out to be insignificant. Those for "Share of specific tariff products" and "Share of zero MFN products" become significantly positive and negative, respectively. However, the results in "Preferential share: RTA" and "Preference margin", which are our main variables, are not changed.

presented that computed tariff exemption ratios differed widely across data sources. Third, computing our measure for a large number of countries, we found that the tariff exemption ratio widely differed across countries and that its world average was approximately 50%. Last, we also showed that it was positively associated with the magnitude of preference margin.

The tariff exemption ratio will become a strong policy measure. Until now, one of the policy measures on RTAs was the share of imports from RTA partners in total imports, which does not necessarily reflect the utilization of preferential schemes. However, it is primarily important to exploit RTA schemes and thus to enhance the utilization of preferential schemes. Also, it may be effective to encourage RTA partner countries to facilitate imports under RTA schemes if they have low utilization of preferential schemes. In order to uncover such utilization, we need the detailed and restricted information. Some countries may not have such data in a ready-made format even for their own countries. Also, they definitely do not know the utilization of preferential schemes in other countries unless it is disclosed. Against this backdrop, the computation of tariff exemption ratios requires only publicly available data and is technically easy. It is expected that, through monitoring the tariff exemption ratio in each country, the utilization of preferences is enhanced in the world.

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Table 1. Preference Utilization Ratios versus Tariff Exemption Ratios: Case of Thailand (Billion THB)

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)
	Imports				MFN rates	Tariff Revenues		V	R
	RTA	MFN	Others	Total (I)+(II)+(III)		Actual	Hypoth. (IV)*(V)	((I)+(III))/(IV)	1-((VI)/(VII))
All Products									
2007	9	2,981	1,832	4,822	0.041	101	197	0.38	0.49
2008	119	3,252	2,395	5,767	0.040	114	230	0.44	0.50
2009	153	2,695	1,582	4,431	0.045	99	200	0.39	0.50
2010	339	3,448	1,914	5,701	0.048	129	272	0.40	0.52
2011	659	3,828	2,117	6,604	0.047	130	307	0.42	0.58
Positive MFN Products									
2007	6	1,312	1,063	2,381	0.083	101	197	0.45	0.49
2008	117	1,426	1,230	2,773	0.083	114	230	0.49	0.50
2009	150	1,146	966	2,262	0.089	99	200	0.49	0.50
2010	323	1,433	1,205	2,961	0.092	129	272	0.52	0.52
2011	615	1,464	1,238	3,317	0.093	130	307	0.56	0.58

Source: Authors' computation

Table 2. Sensitivity to Data Sources

	(I) Imports	(II) MFN rates	(III) Tariff Revenues	(IV)	(V) V	(VI) R
			Actual	Hypoth. (I)*(II)		1-((III)/(IV))
Case (i): Same as All Products in Table 1						
Data source	Customs	Customs	Customs			
2007	4,822	0.041	101	197	0.38	0.49
2008	5,767	0.040	114	230	0.44	0.50
2009	4,431	0.045	99	200	0.39	0.50
Case (ii): Same as Positive MFN Products in Table 1						
Data source	Customs	Customs	Customs			
2007	2,381	0.083	101	197	0.45	0.49
2008	2,773	0.083	114	230	0.49	0.50
2009	2,262	0.089	99	200	0.49	0.50
Case (iii)						
Data source	WDI	WDI	WDI			
2007	4,487	0.044	87	198		0.56
2008	5,330	0.043	96	230		0.58
2009	4,114	0.049	76	202		0.62
Case (iv)						
Data source	Comtrade	WDI	WDI			
2007	4,962	0.044	87	219		0.60
2008	5,950	0.043	96	257		0.63
2009	4,586	0.049	76	226		0.66

Source: Authors' computation

Table 3. Tariff Exemption Ratios in the World

	WDI			WITS		
	Year	Ratio	Tariffs	Year	Ratio	Tariffs
Afghanistan	2012	0.12	6.8			
Algeria	2009	0.48	11.3			
Angola	2009	0.00	7.4			
Antigua and Barbuda	2009	0.58	14.6	2009	0.48	11.7
Armenia	2012	0.03	3.0	2012	0.12	3.4
Australia	2011	0.04	2.5	2011	0.01	2.4
Austria	2012	1.00	2.2	2012	1.00	2.4
Azerbaijan	2012	0.53	6.2			
Bahamas, The	2011	0.34	18.9			
Bahrain	2011	0.67	6.9	2011	0.56	5.1
Bangladesh	2006	0.30	19.9			
Barbados	2007	0.67	19.2	2007	0.64	18.0
Belarus	2012	0.28	4.9			
Benin	2011	0.00	15.2			
Bhutan	2007	0.96	17.8			
Bosnia and Herzegovina	2009	1.00	8.8			
Brazil	2012	0.30	10.2	2012	0.29	10.0
Bulgaria	2012	0.97	2.2			
Burkina Faso	2008	0.00	10.4	2008	0.00	10.5
Cambodia	2008	0.55	11.4	2008	0.55	11.4
Canada	2012	0.64	2.3	2012	0.63	2.2
Chile	2010	0.84	6.0	2010	0.84	6.0
China	2011	0.44	4.6	2011	0.39	4.2
Colombia	2012	0.43	7.7	2012	0.54	9.5
Congo, Dem. Rep.	2009	0.03	11.0			
Congo, Rep.	2007	0.78	14.7			
Costa Rica	2010	0.40	4.3	2010	0.34	3.9
Croatia	2012	0.66	4.3	2012	0.65	4.3
Cyprus	2012	0.78	2.2			
Czech Republic	2012	1.00	2.2	2012	1.00	2.4
Dominica	2011	0.28	13.9	2007	0.25	13.0
Dominican Republic	2010	0.40	6.7	2010	0.39	6.6
Egypt, Arab Rep.	2009	0.30	8.7	2009	0.35	9.4
El Salvador	2012	0.97	7.3	2012	0.97	6.9
Finland	2005	1.00	3.2			
France	2012	0.94	2.2	2012	0.95	2.4
Gambia, The	2008	0.21	14.7			
Georgia	2012	0.58	1.7	2012	0.62	1.9
Ghana	2007	0.00	9.9	2009	0.02	9.6
Greece	2011	1.00	2.4	2011	1.00	2.4
Grenada	2012	0.19	12.8	2008	0.15	12.8
Guatemala	2012	0.75	7.5	2012	0.64	5.2

Table 3. Tariff Exemption Ratios in the World (Cont.)

	WDI			WITS		
	Year	Ratio	Tariffs	Year	Ratio	Tariffs
Honduras	2009	0.71	6.5	2009	0.70	6.3
Hungary	2012	0.98	2.2	2012	0.98	2.4
Iceland	2012	0.41	2.2	2011	0.41	2.3
India	2009	0.17	8.4	2009	0.32	10.1
Indonesia	2007	0.55	5.4	2007	0.34	3.7
Ireland	2012	0.97	2.2	2012	0.97	2.4
Israel	2012	0.55	2.1	2012	0.63	2.5
Jamaica	2011	0.59	9.8	2011	0.59	9.6
Japan	2012	0.09	1.5	2012	0.08	1.5
Jordan	2009	0.66	8.9	2009	0.65	8.7
Kenya	2012	0.65	11.2	2010	0.34	7.0
Korea, Rep.	2010	0.74	8.8	2010	0.65	6.5
Kuwait	2012	0.07	4.4	2012	0.00	4.0
Kyrgyz Republic	2012	0.01	4.1	2012	0.02	4.1
Lao PDR	2008	0.58	13.2			
Latvia	2012	0.88	2.2			
Lebanon	2007	0.43	5.7			
Luxembourg	2012	1.00	2.2	2012	1.00	2.4
Macedonia, FYR	2012	0.76	6.4	2011	0.77	6.3
Malaysia	2009	0.91	5.8	2008	0.88	4.3
Maldives	2009	0.36	20.8	2009	0.33	20.1
Mali	2011	0.14	10.2	2011	0.14	10.1
Malta	2012	1.00	2.2			
Mauritius	2011	0.05	1.2	2010	0.00	1.2
Mexico	2010	0.89	6.2	2010	0.88	5.6
Moldova	2012	0.41	3.7	2012	0.31	3.1
Morocco	2012	0.71	9.2	2012	0.73	9.9
Mozambique	2010	0.56	7.9	2010	0.51	7.2
Nepal	2012	0.33	12.0	2012	0.31	11.7
New Zealand	2006	0.55	10.3	2006	0.18	3.4
Nicaragua	2010	0.78	5.7	2010	0.76	5.3
Norway	2012	0.05	0.6	2012	0.44	1.0
Oman	2012	0.45	4.6	2009	0.44	4.6
Pakistan	2005	0.26	12.2	2005	0.26	12.2
Paraguay	2012	0.57	7.8	2011	0.47	6.6
Peru	2011	0.27	1.9	2010	0.21	2.8
Poland	2012	0.98	2.2	2012	0.98	2.4
Portugal	2012	1.00	2.2			
Romania	2012	0.85	2.2	2012	0.86	2.4
Russian Federation	2005	0.19	9.6			
Rwanda	2012	0.64	12.9	2011	0.66	12.2
Senegal	2011	0.04	8.8	2011	0.06	9.0

Table 3. Tariff Exemption Ratios in the World (Cont.)

	WDI			WITS		
	Year	Ratio	Tariffs	Year	Ratio	Tariffs
Seychelles	2007	0.80	28.3			
Sierra Leone	2012	0.73	9.9			
Singapore	2007	0.78	0.0			
Slovak Republic	2012	1.00	2.2	2012	1.00	2.4
Slovenia	2012	0.96	2.2	2012	0.97	2.4
South Africa	2012	0.29	5.7	2012	0.25	5.3
Spain	2012	0.98	2.2	2012	0.98	2.4
Sri Lanka	2011	0.40	6.3	2011	0.42	6.5
St. Kitts and Nevis	2011	0.05	13.1	2011	0.09	13.7
St. Lucia	2007	0.00	11.6			
St. Vincent and the Grenadines	2007	0.51	11.6	2007	0.52	11.8
Suriname	2010	0.52	11.9	2010	0.47	10.8
Sweden	2007	0.96	3.2	2007	0.96	2.8
Switzerland	2009	0.81	2.3			
Tanzania	2012	0.46	11.7	2012	0.22	8.0
Thailand	2009	0.62	4.9	2009	0.60	4.8
Togo	2010	0.40	14.5	2010	0.14	10.1
Trinidad and Tobago	2008	0.65	10.3	2008	0.12	4.1
Tunisia	2008	0.79	16.0	2008	0.79	16.0
Turkey	2011	0.77	5.2	2011	0.75	4.9
Uganda	2012	0.48	9.1	2011	0.50	8.5
Ukraine	2012	0.26	2.6	2012	0.32	2.8
United Kingdom	2009	0.98	2.8	2009	0.98	2.8
United States	2012	0.41	2.5	2012	0.31	2.1
Uruguay	2012	0.40	7.9	2012	0.43	8.2
Vanuatu	2009	0.00	18.6			
Venezuela, RB	2005	0.38	13.6			
Zambia	2009	0.31	8.6	2008	0.24	9.1

Source: Authors' computation, WDI, and WITS

Notes: "Tariffs" indicates the weighted average of MFN rates (%). The data are from WDI in column "WDI" and from WITS in column "WITS".

Table 4. Tariff Exemption Ratios in country groupings

	N	Mean	S.D.	Min	p25	p50	p75	Max
World	112	0.5352	0.3196	0	0.2946	0.5508	0.7885	1
By Regions								
Africa	24	0.3688	0.2920	0	0.0452	0.3530	0.6456	0.8009
East/Southeast Asia	9	0.5853	0.2352	0.0874	0.5490	0.5823	0.7443	0.9110
South/West Asia	18	0.3832	0.2535	0.0124	0.1739	0.3799	0.5526	0.9603
Europe	31	0.8003	0.2859	0.0458	0.7599	0.9634	0.9986	1
North America	2	0.5255	0.1671	0.4073	0.4073	0.5255	0.6436	0.6436
Latin America	25	0.4992	0.2510	0	0.3397	0.5148	0.6674	0.9693
Pacific	3	0.1952	0.3057	0	0	0.0381	0.5476	0.5476
By RTAs								
AFTA	6	0.6660	0.1479	0.5490	0.5547	0.5990	0.7832	0.9110
COMESA	8	0.4074	0.2845	0.0309	0.1746	0.3933	0.6456	0.8009
EU	21	0.9467	0.0876	0.6567	0.9614	0.9773	0.9990	1
MERCOSUR	4	0.4135	0.1131	0.3020	0.3395	0.3909	0.4875	0.5702
NAFTA	3	0.6462	0.2402	0.4073	0.4073	0.6436	0.8876	0.8876
SAFTA	8	0.3630	0.2591	0.1172	0.2163	0.3171	0.3799	0.9603

Source: Authors' computation

Note: This table reports country-group averages of tariff exemption ratios computed by the WDI data on the weighted average of MFN rates.

Table 5. Basic Statistics for regressions

	Obs	Mean	Std. Dev.	Min	Max
Tariff exemption ratio	112	0.535	0.320	0	1
Preference share: RTA	112	0.481	0.260	0	0.991
Preference share: GSP	112	0.054	0.100	0.000	0.351
Export intensity	112	0.300	0.231	0.030	1.733
Preference margin	112	0.009	0.019	-0.040	0.084
ln GDP per capita	112	8.709	1.454	5.710	11.551
Weighted-Simple MFN difference	112	-0.009	0.037	-0.170	0.212
Share of high MFN products	112	0.199	0.214	0	0.909
Share of specific tariff products	112	0.028	0.045	0	0.301
Share of zero MFN products	112	0.275	0.244	0	1.000
Consolidated dummy	112	0.625	0.486	0	1

Source: Authors' computation

Table 6. Correlation with Basic Elements

	(I)	(II)	(III)	(IV)
Preference share: RTA	0.756***	0.693***	0.643***	0.584***
	[0.103]	[0.108]	[0.109]	[0.112]
Preference share: GSP			0.962***	0.945***
			[0.230]	[0.222]
Export intensity		0.265**		0.253**
		[0.120]		[0.102]
Constant	0.172***	0.122**	0.174***	0.127**
	[0.059]	[0.057]	[0.060]	[0.057]
Number of observations	112	112	112	112
R-squared	0.3800	0.4139	0.4624	0.4934

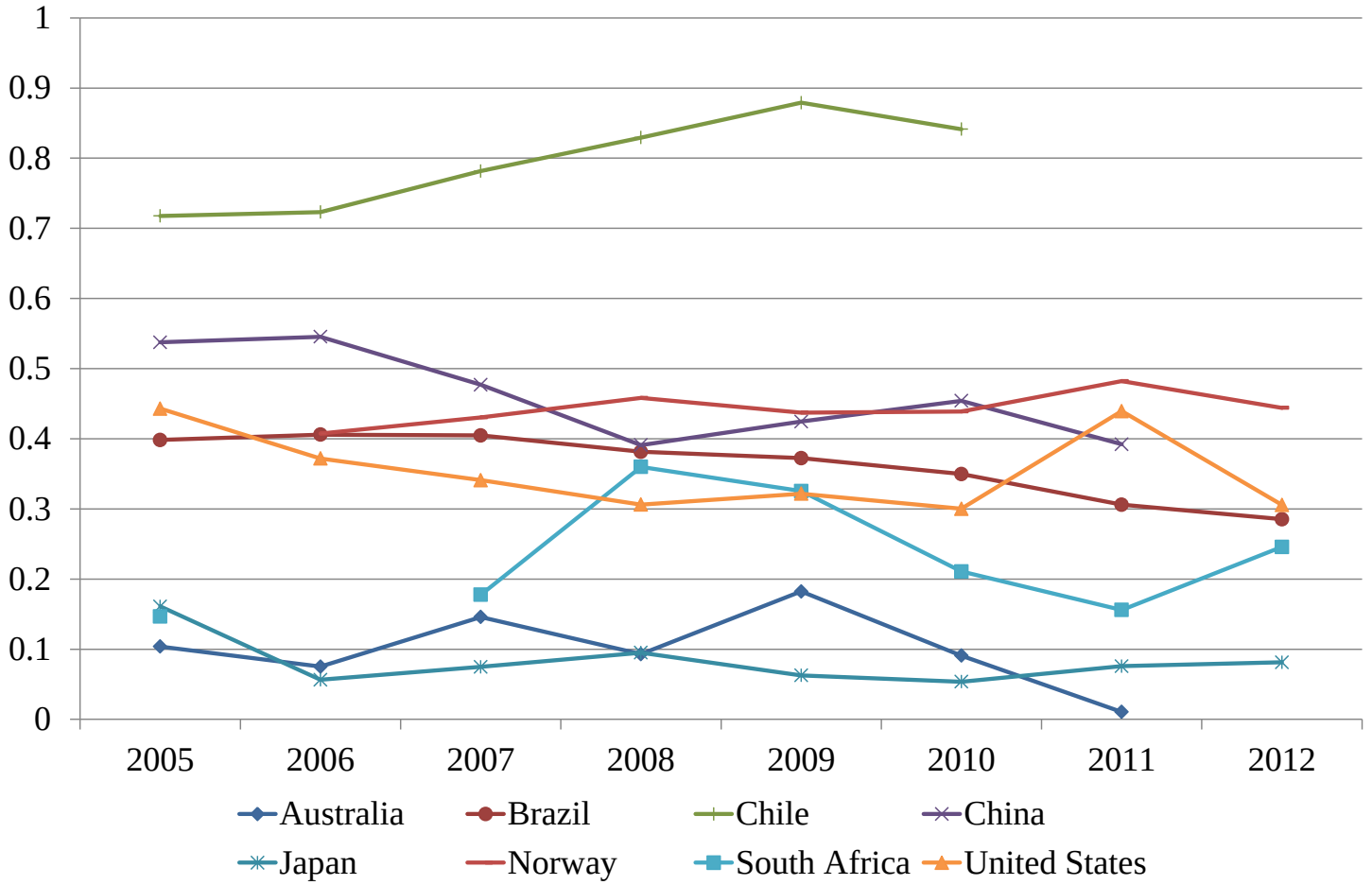
Notes: The dependent variable is the tariff exemption ratio computed by the WDI data on the weighted average of MFN rates. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In the parenthesis is the robust standard error.

Table 7. Correlation with Advanced Elements

	(I)	(II)	(III)
Preference share: RTA	0.490***	0.482***	0.526***
	[0.129]	[0.128]	[0.121]
Preference share: GSP	0.808***	0.760***	0.814***
	[0.246]	[0.253]	[0.283]
Export intensity	0.255***	0.247**	0.282***
	[0.098]	[0.103]	[0.098]
Preference margin	2.579*	2.646*	4.700***
	[1.550]	[1.512]	[1.645]
ln GDP per capita		0.007	0.013
		[0.020]	[0.021]
Weighted-Simple MFN difference			2.064***
			[0.626]
Share of high MFN products			0.254**
			[0.128]
Share of specific tariff products			-0.274
			[0.471]
Share of zero MFN products			-0.058
			[0.116]
Consolidated dummy			0.043
			[0.052]
Constant	0.155***	0.102	-0.039
	[0.059]	[0.165]	[0.193]
Number of observations	112	112	112
R-squared	0.5067	0.5074	0.5566

Notes: The dependent variable is the tariff exemption ratio computed by the WDI data on the weighted average of MFN rates. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In the parenthesis is the robust standard error.

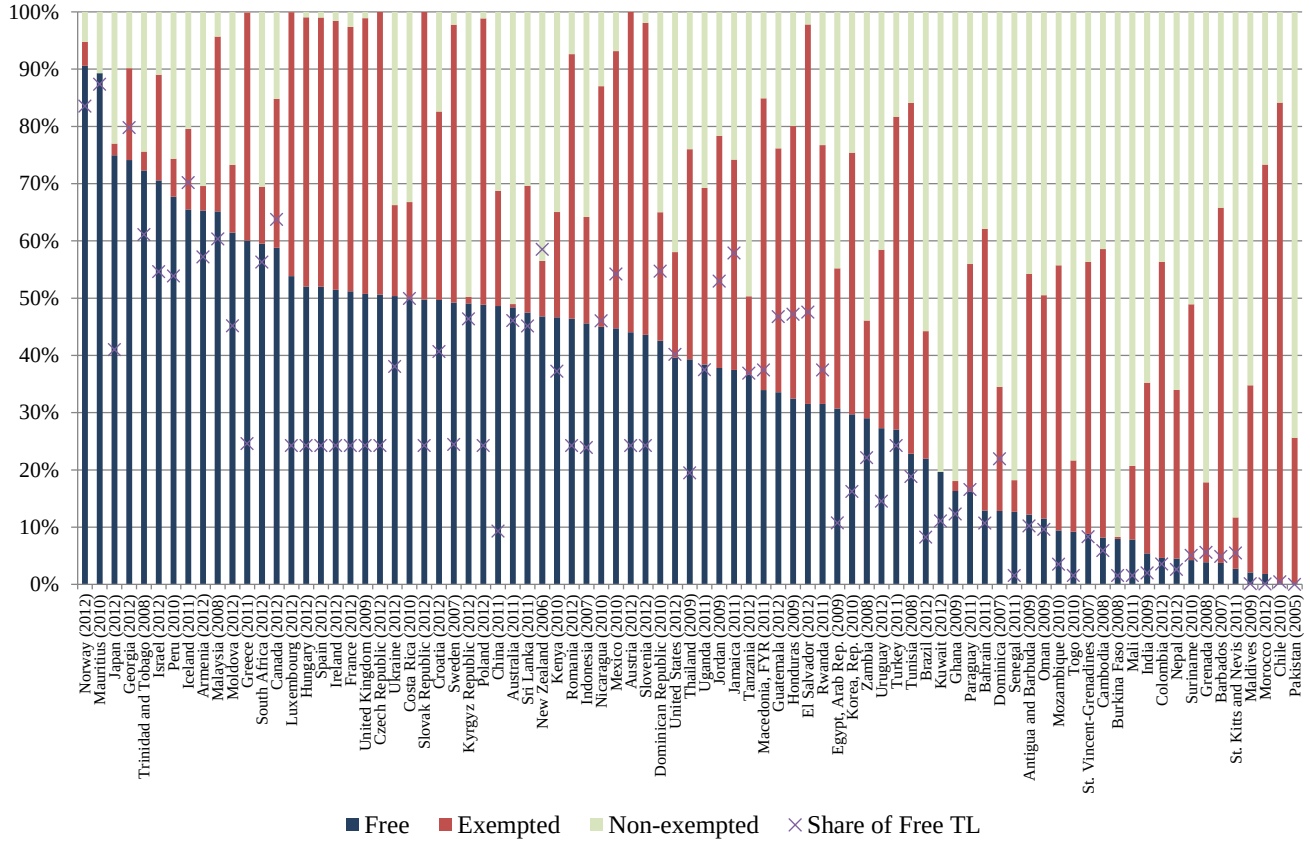
Figure 1. Trend in Tariff Exemption Ratios for Selected Countries



Source: Authors' computation

Note: In this figure, we employ the tariff exemption ratio computed by the WITS data on the weighted average of MFN rates.

Figure 2. Quasi-decomposition of Total Imports



Source: Authors' computation

Notes: In this figure, we employ the tariff exemption ratio computed by the WITS data on the weighted average of MFN rates. "Free" indicates the share of imports of products with zero MFN rates in total imports. "Exempted" and "Non-exempted" refer to the shares of the exemption-basis preferential and non-preferential imports in total imports, respectively. "Share of Free TL" is the share of the tariff line-level products with zero MFN rates in total.

Appendix A. Equivalence of Equations (2) and (5)

In this appendix, we demonstrate that equation (2) is equivalent to equation (5). The weighted average of MFN rates can be defined as follows.

$$Weighted\ Average\ of\ MFN\ Rates \equiv \sum_i \left\{ \left(\frac{I_i^M + I_i^P}{\sum_k (I_k^M + I_k^P)} \right) \cdot t_i^M \right\}$$
$$= \sum_i \left\{ \frac{(I_i^M + I_i^P) \cdot t_i^M}{\sum_k (I_k^M + I_k^P)} \right\} = \frac{\sum_i \{ t_i^M (I_i^M + I_i^P) \}}{\sum_k (I_k^M + I_k^P)}$$

Therefore, the denominator in the second term in equation (5) can be summarized as follows.

$$(Weighted\ Average\ of\ MFN\ Rates) \times (Total\ Imports)$$
$$= \frac{\sum_i \{ t_i^M (I_i^M + I_i^P) \}}{\sum_k (I_k^M + I_k^P)} \times \sum_k (I_k^M + I_k^P) = \sum_i t_i^M (I_i^M + I_i^P)$$

This term is exactly same as the denominator in the second term in equation (2). Furthermore, by definition, the numerator in the second term in equation (2) is same as "*Total Revenues from Import Duties*", the numerator in the second term in equation (5). As a result, equation (5) is equivalent to equation (2).

Appendix B. Several Additional Tables

Table B1. Difference in Tariff Exemption Ratios According to Data Sources

	Difference
N	83
Mean	0.027
S.D.	0.107
Min	-0.398
p25	-0.003
p50	0.005
p75	0.047
Max	0.531

Notes: This table reports various statistics on the difference between tariff exemption ratios based on the data from WDI and WITS.

Table B2. The Share of Products with Zero MFN Rates

	2005	2006	2007	2008	2009	2010	2011	2012
Australia	48%	48%	46%	46%	46%	46%	46%	
Brazil	7.1%	7.0%	7.1%	7.3%	7.4%	7.5%	7.5%	8.2%
Chile	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%		
China	8.5%	8.6%	8.5%	8.5%	8.2%	8.4%	9.3%	
Japan	41%	42%	42%	42%	42%	42%	42%	41%
Norway		84%	84%	83%	84%	84%	84%	84%
South Africa			54%	54%	56%	57%	56%	56%
United States	41%	41%	40%	40%	40%	40%	40%	40%

Source: WITS

Table B3. Fractional-logit Model

	WDI	WITS
Preference share: RTA	2.397***	3.056***
	[0.607]	[0.615]
Preference share: GSP	4.434**	1.568
	[1.743]	[1.789]
Export intensity	1.536***	1.151
	[0.587]	[0.785]
Preference margin	23.034***	19.167**
	[8.749]	[9.625]
ln GDP per capita	0.044	-0.102
	[0.106]	[0.114]
Weighted-Simple MFN difference	9.989***	15.645**
	[3.066]	[6.594]
Share of high MFN products	1.210**	0.581
	[0.569]	[0.809]
Share of specific tariff products	-1.592	13.628***
	[2.629]	[5.168]
Share of zero MFN products	-0.315	-1.050*
	[0.569]	[0.623]
Consolidated dummy	0.229	0.441
	[0.239]	[0.323]
Number of observations	112	83
Log pseudolikelihood	-47.40	-33.91

Notes: ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In the parenthesis is the robust standard error. The dependent variables in columns "WDI" and "WITS" are tariff exemption ratios computed by employing the data on the weighted average of MFN rates from WDI and WITS, respectively.