Trans-Pacific Tariff Barriers: a Case Study of Five Asia-Pacific Developing Countries and Canada

Bo Chen

School of International Business Administration, Shanghai University of Finance and Economics, Shanghai, China, 200434

Published online: 16 Sep 2014.

To cite this article: Bo Chen (2014) Trans-Pacific Tariff Barriers: a Case Study of Five Asia-Pacific Developing Countries and Canada, China Economic Journal, 7:2, 251-260, DOI: 10.1080/17538963.2014.928975

To link to this article: http://dx.doi.org/10.1080/17538963.2014.928975
Trans-Pacific Tariff Barriers: a Case Study of Five Asia—Pacific Developing Countries and Canada

Bo Chen*

School of International Business Administration, Shanghai University of Finance and Economics, Shanghai, China, 200434

(Received 28 March 2014; accepted 22 May 2014)

Though the Trans Pacific Partnership (TPP) is believed to greatly benefit the developing countries of the Asia—Pacific (AP) region, most of the countries, such as China, are still hesitant to join. The major concern for these countries is whether or not the gains from the free trade provisions of the TPP will provide enough of an advantage given that most of them have already joined the WTO. In this paper, I first apply Feenstra’s (1995) TRI to gauge the actual Canadian tariff barriers facing five Asia—Pacific developing countries: China, Thailand, Malaysia, the Philippines, and Indonesia. The calculation of TRIs enables us to estimate the gains (from retrieving deadweight loss due to tariff distortion) to Canada if it completely removes its tariff barriers from the 2010 level against the five exporting countries. The gains for Canada would reach USD 276.45 million solely from China’s exports, and another USD 33.96 million total from the four other countries. Then, based on the gravity model, I estimate the impact of tariff reduction on imports and the gains, in terms of possible export growth, to the five developing countries. I find China’s exports to Canada may increase by 60.58%. Export growth then would be 68.21% for Indonesia, 39.77% for Malaysia, 69.64% for the Philippines, and 42.62% for Thailand.

Keywords: trade restrictiveness index; demand elasticities; deadweight loss (DWL)

JEL classification: F12; F14; O47

1. Introduction

One of the most remarkable features of recent globalization is the great openness in developing countries, especially in East Asia, such as China. As a result, trans-Pacific trade has undergone salient growth over the past two decades. For example, according to Statistics Canada, Canada’s import value from APEC countries (excluding the U.S. and Mexico) increased by more than 4.2 times from 1995 to 2010, whereas Canadian worldwide imports increased by three times over the same time. As a result, APEC import share increased to 20.14% in 2010 from 15.09% in 1995. China in particular contributed the most to Canada—APEC trade as its exports to Canada increased by more than 21 times during this period, or from 1.66% in 1995 to 11.02% in 2010 by import share. The surging trade is partly due to the effective removal of tariff barriers mainly through the WTO and its predecessor, GATT.

Actively promoted by the United States since 2008, the Trans-Pacific Partnership (TPP) is an ambitious Free Trade Agreement (FTA) which aims to completely remove...
tariff barriers between members across the Pacific, to improve regional trade, and to tighten economic relationships. Under the context that the global economic crisis is not yet fading away, and the world puts great hope on economic development in the AP region, the TPP naturally catches attention worldwide. The major developing countries in the Asia-Pacific (AP) region, such as China, have benefited greatly from international trade. Most of them, however, are still hesitant to join the TPP. In addition to the potentially high costs of meeting the standards set by the US, countries then are concerned whether or not gains from free trade will be great enough to offset the costs. After all, most of them have already joined the WTO and enjoy fairly low tariffs, such as the simple or weighted average tariffs.

However, to evaluate the potential gains from tariff reduction, one needs to answer the following question: how much is the actual tariff barrier imposed by the importing country on each individual country?

Existing measures on tariff barriers are mainly simple and value-weighted averages of all tariff lines. Such measures, however, are neither theoretically solid nor empirically convincing. First of all, simple average neglects the huge difference of import values among imported goods, and therefore does not take into account the dispersed degrees of importance of different goods. Secondly, although the value-weighted average tariff rate does treat imported goods differently, it does so in a misleading way; goods subject to higher tariffs will be imported less and thus receive lower weights. Therefore, value-weighted average tariff rates tend to underestimate the real restrictiveness. One extreme case is that a prohibitive tariff will not be counted in the weighted average tariff rate because the import volume is virtually zero. Furthermore, goods usually have different price elasticities of demand, that is, their responsiveness to price change (due to imposing tariff) varies vastly. Therefore, these types of measures, which lack solid theoretical support, are in general unsatisfactory gauges of real trade restrictiveness (Rodriguez and Rodrik, 2001).

Cipollina and Salvatici (2008) and Coughlin (2010) survey and discuss literature on measuring trade restrictiveness and support the idea that an ideal restrictiveness (tariff) indicator should leave the country or a representative agent indifferent between facing the uniform tariff or facing the various tariffs of different industries. For example, Kreickemeier and Raimondos-Møller (2008) and Falvey and Kreickemeier (2009) use this idea to discuss the welfare impact of tariff reform.

Anderson and Neary’s (1992, 1994, 1996, 2003, 2007) seminal work, in particular, provided trade restrictive indexes on a sound theoretical ground. They define the trade restrictiveness index (TRI) as a uniform tariff that generates the same aggregation results (i.e., welfare distortion, profit, volume, etc.) as the existing tariff structure. Furthermore, their application shows the empirical applicability of the TRI in computable general equilibrium (CGE) models. The CGE-based indexes can take into account the income and substitution effects due to tariff changes and the interaction between tariff policy and domestic policies (i.e., taxation policy and monetary policy). However, these indices suffer from a serious problem; due to the constraints in CGE models, tariff changes have to be studied at an aggregated industry level, which cannot capture the heterogeneity of the protection levels within these industries.

Based on a partial equilibrium, which ignores the feedback effects of domestic industries in general equilibrium, Feenstra (1995) provides a simplified version of TRI that only requires import demand elasticities, import shares, and tariff schedules. The greatly simplified TRI can be conveniently applied in econometric intensive approaches, which allows for
tractability of highly disaggregated tariff lines. Kee, Nicita, and Olarreaga (2008, 2009) have applied Feenstra’s (1995) TRI and estimate TRI indexes (as well as their trade barrier indexes) for 88 countries, including developed and developing ones.

In this paper I investigate the potential gains from the Trans-Pacific Free Trade Agreement by gauging the actual Canadian tariff barriers, based on Feenstra’s (1995) TRI, facing five representative developing countries in the Asia—Pacific region: China, Thailand, Malaysia, the Philippines, and Indonesia. There are two reasons for why I chose Canada (rather than the US) as the importing country in this investigation. First of all, as emphasized in Feenstra (1995), TRI is built on the assumption of a small open economy. That is, TRI assumes a complete tariff pass-through. Canada was chosen since it represents a typical small open economy and is thus consistent with the assumption of TRI. The TRI for the U.S., on the other hand, may have serious measurement errors, as it holds the position of the largest open economy in the world. Secondly, Canada does not have significant non-tariff barriers, whereas the U.S. does.

My investigation takes the following steps. I first calculate Canadian TRIs against each of the selected AP developing countries. Furthermore, given the 2010 TRIs, I also estimate the gains to Canada (in terms of retrieving deadweight loss due to tariff distortion) from the imports of the five countries if Canada has an FTA (i.e., TPP) with them. Then based on a gravity model according to Anderson and Van Wincoop (2003), I estimate the impact of tariff reduction on exports and infer the gains to the five countries in terms of their export growth from their 2010 level, if free trade with Canada is possible.

I make contributions on the following two fronts. First, different from Kee, Nicita, and Olarreaga (2008) which report the cross country TRIs, I borrow the import demand elasticities from Chen and Jacks (2012) and construct dynamic Canadian TRIs against the five developing AP countries from 1995 to 2010. Second, based on TRI and a gravity model, I infer the gains from tariff barrier reduction for both Canada and the five developing AP countries.

The rest of the paper is organized as follows. Section 2 presents an overview of Canadian imports and tariffs from 1995 to 2010. Section 3 constructs the country-specific TRIs. Section 4 estimates the gains from tariff barrier reduction. Section 5 concludes.

2. Data Overview

Import data consist of Canadian country specific import values and tariffs reported by the WITS database at the six-digit HS level (HS-6), a databank that is operated by the World Bank. Figure 1 plots the annual Canadian imports and the share from APEC countries. Canadian imports (in nominal terms) almost doubled in the period as shown by the left vertical axis. The APEC share (excluding the U.S. and Mexico), however, grew even faster, increasing from 13.82% in 1995 to 20.14% in 2010 as indicated by the right vertical axis.

To further reveal the import contributions from the AP countries, I show in Figure 2 the import share of the five selected countries in this paper: China, Thailand, Malaysia, the Philippines, and Indonesia. Not surprisingly, China contributes the most to Canadian import growth. Its share increased to 11% in 2010 from 2% in 1995. Though relatively smaller in size, Thailand’s contribution is nontrivial. Its import share was 0.60% in 2010 compared to 0.45% in 1995. The other three countries, on the other hand, have quite stable import shares.
WITS reports the annual Canadian tariff to each individual exporting country at the 6-digit HS level. As an overview of the country specific tariff barriers imposed by Canada, Figures 3a and 3b show the conventional simple and weighted average tariffs for the five AP countries respectively. First of all, both figures indicate that overall Canadian tariff barriers against them have been reduced since 1995. Second, comparing Figures 3b with 3a, the weighted average tariffs are in general smaller than the simple average tariffs, which may indicate that the negative relation between tariff and imports is quite strong, so that higher tariff barriers receive lower weights. Such a problem is not serious for China whose simple and weighted average tariffs are quite similar most of the time. Third, Figure 3a shows there are some spikes, especially in 2003, in tariff barriers if measured by simple average, whereas Figure 3b shows relatively stable barriers over time. The difference implies that though Canada significantly increased its tariffs on several products⁴, these products are not very important exports to most of the five AP countries in particular.

Though the overview of the tariffs have already gave us some insight into the implications of the dynamic changes in tariff barriers facing the five AP countries, neither of the conventional measures, as argued in Section 1, are theoretically sound. This fault may result in misleading empirical implications. To have a better gauge of the tariff

---

Figure 1. Canadian Imports: 1995–2010

Figure 2. Canadian Import Shares of the 5 AP countries

---

⁴ The products are not explicitly mentioned here.
3. The general TRI and country-specific TRIs

According to Feenstra (1995), if we just focus on the partial equilibrium in imported goods (i.e., without considering the interaction between imported goods and domestic goods), the first order approximation of the deadweight loss (DWL) generated by tariffs is given by

\[ DWL = \frac{1}{2} \sum_n (\frac{\partial c_n}{\partial p_n}) (p_n t_n)^2 \]  (1)

Where \( c_n \) is the import demand on goods \( n \) and \( p_n \) is its price, \( t_n \) is the corresponding tariff; and the subscript \( t \) denotes year. TRI is defined as a uniform tariff, which could generate the same aggregate DWL as the existing various tariffs do. That is,
\[ DWL = \frac{1}{2} \left[ \sum_n \left( \frac{\partial c_n}{\partial p_n}(p_n) \right)^2 \right] \text{TRI}^2 \]

\[ \Rightarrow \text{TRI} = \left[ \frac{1}{2} \sum_n \left( \frac{\partial c_n}{\partial p_n}(p_n) \right)^2 / \frac{1}{2} \left( \frac{\partial c_n}{\partial p_n}(p_n) \right)^2 \right]^{1/2} \]

(2)

Where \( s_n \) is the import share; \( \sigma_n \) is the corresponding elasticity of substitution that is time invariant;

Equation (2) shows that TRI also considers prohibitive tariffs since even though the imports are zero, the weights of these prohibitive tariffs in TRI, as measured by the marginal demand, are still positive. Furthermore, this equation also shows the convenience of application; it only requires the information on tariff, import share and demand elasticities.

Tariff and import share can be directly obtained or calculated from WITS. The key to calculate TRI then is to have demand elasticities. Based on Feenstra (1994), Broda and Weinstein (2006) derive a simple simultaneous equation system from a typical CES utility structure to estimate the unbiased elasticities of substitution. Though elasticity of substitution is not conceptually the same as demand elasticity, these two elasticities are exchangeable in the context of a typical CES utility structure (for instance, the aggregate utility function in Melitz (2003)). Broda, Limao, and Weinstein (2008) apply this approach to estimate both import demand and export supply elasticities. Based on similar procedures, Chen and Jacks’s (2012) provide detailed estimates of the elasticity of substitution (among Canadian import varieties), \( \sigma_g \), at highly disaggregated HS 10-digit level based on the former approach. Another approach to estimating demand elasticities is based on translog GDP functions as in Kee, Nicita, and Olarreaga (2008). It is hard to argue which approach provides better estimates of demand elasticities. Yet in this paper I borrow the Canadian import demand elasticities from Chen and Jacks (2012) for the following two reasons. First, as reported by Chen and Jacks (2012), their estimates are comparable, in terms of mean and median, to the results for Canada in both Broda, Greenfield, and Weinstein (2006) and Kee, Nicita, and Olarreaga (2008). Second, as argued in Anderson and Neary (2005) and Irwin (2010), given the TRI structure in equation (2), the elasticities appear in both the numerator and denominator and hence they largely cancel each other out. That is, TRI is not very sensitive to demand elasticities. Different sets of demand elasticities may generate similar TRIs as long as their distribution is similar.

Next I aggregate the HS-10 elasticities in Chen and Jacks (2012) to HS-6 level to match the tariff data and calculate the Canadian TRIs against the five selected AP countries: China, Thailand, Malaysia, the Philippines, and Indonesia.

The country-specific TRIs are reported in Table 1. China faced a higher TRI than the other five countries before 2000 due to the fact that China was the only country here who joined the WTO in December 2001, whereas others became WTO member in 1995. Yet the TRI against China was not dramatically adjusted in 2001–2002 since China gradually lowered its tariff barriers against WTO member countries before its entry to the WTO and thus faced a lower Canadian tariff barrier before 2001 from reciprocity. The TRI against Indonesia is relatively stable compared to the other four countries, and interestingly it was not impacted by the 2003 tariff surge in Canada. Among the countries, Malaysia enjoyed the lowest Canadian TRI.
except between 2007 and 2008. The pattern of TRIs against the Philippines and Thailand are quite similar. It is worth noting that both countries suffered severely from the 2003 tariff surge in Canada: the Philippines’ TRI increased to 23.18% in 2003 from 6.97% in 2002, Thailand’s TRI was 22.53% in 2003 compared to 7.21% in 2002.

4. Impact of Tariff Barrier Reduction

Equation (1) gives us the first order approximation of the deadweight loss due to tariff distortion. Table 2 reports the country specific DWL associated with each country’s exports to Canada. It is worth noting that though the Canadian tariff barriers were largely reduced against individual countries, the DWL is quite volatile and does not exhibit a decreasing trend. The phenomenon is due to the fact that DWL also depends on import value, and reducing tariff barriers usually accompanies an increase in imports. As a result, the DWL may not decrease. Table 2 also gives us an interesting estimation for the direct gains to Canada if it has an FTA with these countries. For example, had Canada moved to free trade with the five countries in 2011, the gains from retrieving DWL would be USD 276.45 million from China’s exports and USD 33.96 million from the other four countries.

The gains to the five exporting countries, however, cannot be directly measured from TRI. In the following, I first estimate how responsive imports are to tariff barriers and then infer the gains to the five exporting countries in terms of their potential export growth if Canada completely removes its tariff barriers against them.

Anderson and Van Wincoop (2003) provide a gravity model with solid theoretical basis. I follow their approach and estimate the following regression:

\[
x_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{CAN,t} + \beta_3 d_{it} + \beta_4 TRI_i + \beta_5 im_{it} + \beta_6 ex_i + \epsilon_i
\]  

(3)

where \(i = 1,\ldots,5\) refers to the 5 AP countries, \(x_{it}\) denotes country \(i\)’s exports to Canada (which equals the Canadian imports from country \(i\)), \(GDP_{it}\) and \(GDP_{CAN,t}\) respectively denote the GDP of country \(i\) and Canada, \(d_{it}\) and \(ex_i\) are the distance and exchange rate
between country $i$ and Canada, respectively. $Im_{i,t}$ is the Canadian imports in year $t$, net of the imports from country $i$, to capture the multilateral resistance effect. $\epsilon_t$ is the error term assumed to follow an i.i.d. All the variables except distance are available in World Development Indicator. Data on distance is available in CEPII. I take log values of all the regressors except for TRI.

In a balanced panel regression where time specific effect and country specific effect are controlled, I drop Canadian GDP ($gdp_{CAN,t}$) and distance ($d_t$) in equation (3) due to multicollinearity.\(^5\) Table 3 reports the results of a panel regression with random time and country specific effects. All the estimates for the regressors’ coefficients are significant except for multilateral resistance. Particularly, the coefficient of TRI reveals that ceteris
paribus, a country may increase its exports to Canada by 8.39% if Canada reduces its tariff barrier by 1%. In other words, had Canada completely removed its tariff barriers from its 2010 level, China’s exports to Canada are expected to increase by as much as 60.58%. The growth would be 68.21% for Indonesia, 39.77% for Malaysia, 69.64% for the Philippines, and 42.62% for Thailand.

5. Conclusion

Though TPP is believed to benefit the major developing countries in the AP region, most of them, such as China, are still hesitating to join the TPP. Besides the potentially high cost of meeting the standards and rules mainly set by the U.S., the major concern is whether the gains from free trade will be big enough. However, to estimate the gains from tariff barrier reduction, one first needs to have a reliable gauge on tariff barriers.

In this paper, I first apply Feenstra’s (1995) TRI to gauge the actual Canadian tariff barriers facing five developing countries in Asia Pacific regions: China, Thailand, Malaysia, the Philippines, and Indonesia. The calculation of the TRI enables us to estimate the gains to Canada if it completely removes its tariff barriers from the 2010 level against the five exporting countries. The gains from retrieving DWL would be USD 276.45 million from China’s exports and 33.96 million from the other four countries. Then, based on a gravity model according to Anderson and Van Wincoop (2003), I estimate the impact of tariff reduction on imports and infer the gains, in terms of possible export growth, to the five countries if Canada completely reduces its tariff barriers against them due to FTA agreements (i.e., TPP). The results suggest that ceteris paribus, a country may increase its exports to Canada by 8.39% if Canada reduces its tariff barrier by 1%. That is, China’s exports to Canada may increase by as much as 60.58% from its 2010 level. The export growth would be 68.21% for Indonesia, 39.77% for Malaysia, 69.64% for the Philippines, and 42.62% for Thailand. Thus even though the WTO has already helped to effectively remove trade barriers, trans-Pacific FTA such as the TPP may still be attractive.

This paper, however, only considers tariff barriers and the gains from falling tariff barriers in a partial equilibrium setting. Thus the limits of this paper are two-fold. First, it does not consider non-tariff barriers and their interaction with tariff barriers, which is an important issue in the U.S. trade barriers. Second, it does not consider the impact of tariff reduction on domestic products. Nevertheless, future research aiming at addressing these limits is not only theoretically interesting but also empirically relevant for FTA studies.

Acknowledgements

For financial support, I thank the Natural Science Foundation of China, NO. 71103116, and the 2013 Shanghai Municipal Government Consultation Project on ‘China (Shanghai) Pilot Free Trade Trial Zone’, NO. 2013-YJ-H01.

Notes

1. One common way is to use actual import volumes as weights. See, for example, Edwards (1998).
2. See Anderson and Neary (2005) for a thorough discussion.
3. They include Australia, Brunei Darussalam, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, Papua New Guinea, Philippines, Russia, Singapore, Taiwan, Thailand, and Vietnam.
4. In 2003, Canada dramatically increased its import tariffs on alcoholic and nonalcoholic beverage products which are important Canadian imports. For instance, Canada increased its tariff on HS code-220710 (‘undenatured ethyl alcohol of an alcoholic strength by volume of 80% vol or higher’) from 15% to 1546%; it also increased the tariff on HS code-220410 (‘Sparkling wine’) from 4% to 446%.

5. Time specific effect fully absorbs Canadian GDP and country specific effect

Reference


