

Trade Competition and Tariff Reduction Strategies between Taiwan and China

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Abstract: China is now the nexus of production network involving most countries in Asia and a final export market for the East Asia region. Cross-Strait trade and investment between Taiwan and China have surged over the past several years. Owing to differences in their level of industrial development and the resources available to them, there are only a few industries in which Taiwan and China are in direct competition in international markets, while their export performance in each other's markets is superior to their performance in international markets as a whole. Nevertheless, the similarities in the products that Taiwan and China export to each other mean that the liberalization of cross-Strait trade will have a negative impact on some industries. As regards possible tariff reduction strategies, industries with respect to which Taiwan might be advised to adopt a more aggressive, open tariff reduction strategy include plastics, textiles, glass and glassware, iron and steel, optical instruments, and toys and miscellaneous manufactured articles. Economic considerations will not be the only factors affecting the negotiating strategies chosen; political considerations will also exert a major impact. Analysis of the tariff reduction model adopted by China in the negotiation of trade agreements with other countries in the past shows that the strategy China adopts has tended to vary considerably, depending on the identity of the country with which China is negotiating and various political considerations.

Keywords: regional trade and investment; export competitiveness; tariff reduction strategies.

JEL Classification: F14; F15; F20

1. Introduction

China has become a world engine of growth, with its economy registering at an average of 9.9% a year for the period 1979–2011 (Wong, 2012). It is now the nexus of production network involving most countries in Asia and a final export market for the East Asia region (Chen *et al.*, 2007). Nevertheless, due to the panic of covid-19, China's economy is now facing a daunting challenge and reshuffling global supply chain is in progress as well. Nearer home, China-Taiwan trade and investment have surged over the past several years. Owing to the geographical proximity of the China

market and contract manufacturing, tensed cross-Strait relations have been extremely unfavorable to Taiwan's economy. It is worth noting that the peaceful cross-Strait development will also have a positive impact on economic growth in Taiwan by facilitating regional economic integration.¹

Today, China is Taiwan's largest export market. In 2019, Taiwan's exports totaled US\$329.32 billion, of which 40.2% went to China.² Viewed in terms of individual product categories, the cross-Strait trade between Taiwan and China is heavily concentrated in a limited number of product categories. As shown in Table 1, ten product categories with two-digit level tariff code chapters of the Harmonized System (HS) accounted for 90.7% of Taiwan's exports to China; four of these product categories – HS85 (electrical machinery and equipment and parts thereof), HS84 (Machinery and parts thereof), HS90 (optical and precision instruments and parts thereof) and HS39 (plastics and articles thereof) – accounted for 81.5% of exports, a very high figure.

Table 1
Trade between Taiwan and China – by industry, 2019
(units: US\$ billion; %)

HS Code	Description	Taiwan's Exports to China	%
	Total Taiwanese exports to China (all HS code chapters)	132.15	
85	Electrical machinery and equipment and parts thereof	78.13	59.1%
84	Machinery and parts thereof	10.84	8.2%
90	Optical and precision instruments and parts thereof	10.54	8.0%
39	Plastics and articles thereof	8.21	6.2%
29	Organic chemicals	4.83	3.7%
74	Copper and articles thereof	2.83	2.1%
27	Mineral fuels, mineral oils, and products of their distillation	1.24	0.9%
72	Iron and steel	1.17	0.9%
38	Miscellaneous chemical products	1.10	0.8%
54	Glass and glassware	0.92	0.7%
	Top ten HS code chapter categories' share of total	90.7%	

Source: Taiwan Directorate General of Customs, <www.customs.gov.tw>, accessed 27 August 2020.

As regards investment, Taiwanese enterprises first began to invest in China in 1983. The relaxation of restrictions on Taiwanese citizens visiting relatives in China in 1987 sparked off a massive wave of investment. According to statistics published by Taiwan's Department of Investment Services, Ministry of Economic Affairs indicated that China is the main recipient of Taiwan's overseas investment, accounting for around 37.9% of the total in 2019. The bulk of Taiwanese investment is in the southeast coastal

region stretching from the Pearl (Zhujiang) River Delta up to the Yangtze (Changjiang) River Delta region that includes Shanghai, southern Jiangsu and northern Zhejiang (Yang and Hsia, 2007), as well as the Bohai Gulf region (including Beijing and Tianjin).³ This market concentration is partly because of the geographical advantages that these regions possess, as well as the opportunity to develop and penetrate the Chinese domestic market.⁴ As Taiwanese firms investing in China increasingly tend to do so as part of a “center-satellite” system in which several connected enterprises establish themselves in China together, this cross-Strait investment has stimulated the formation of new industry clusters and of comprehensive industry value chains that integrate upstream, midstream and downstream operations.⁵

With cross-Strait economic and financial cooperation becoming increasingly critical and distinctive, the two sides have sought to normalize cross-Strait economic relations and establish a framework for institutionalized economic cooperation. On 29 June 2010, Taiwan signed the Economic Cooperation Framework Agreement (ECFA) with China (Tien and Tung, 2011); the agreement came into effect on 12 September 2010.⁶ However, ECFA is only a framework agreement. The ECFA provisions that will produce an immediate benefit in terms of tariff reductions are namely the “Early Harvest” provisions. With regard to the Early Harvest list items that became effective as of 1 January 2011, there were only 539 product items with respect to which China undertook to reduce the tariff rates applying to imports of these product items from Taiwan (these 539 items accounted for around 6% of all tariff items). In 2011, Taiwanese exports to China of these Early Harvest items accounted for 16% of Taiwan’s total exports to China, and the growth rate in exports of these items to China was 9.88%, compared to a growth rate of 8% for Taiwanese exports to China as a whole. There were 267 Early Harvest items with respect to which Taiwan undertook to reduce the tariff rates applying to exports of these items from China to Taiwan; as of 2011, Chinese exports to Taiwan of these Early Harvest items accounted for 11.7% of China’s total exports to Taiwan, and the growth rate in exports of these items from China to Taiwan was 27.56%, compared to a growth rate of 21.26% for Chinese exports to Taiwan as a whole. Indeed, these data show that the tariff reductions have helped to boost trade in both Taiwan and China, but that the share of total trade accounted for by the Early Harvest items is very low.

The existing literature in this area tends to focus on analysis of the impact of ECFA on overall economic development in Taiwan and China. For example, the simulation results presented in one study by the Chung-Hua Institution for Economic Research (CIER) published in 2009 suggested that ECFA would provide real GDP growth of 1.65–1.72% for Taiwan (CIER,

2009); a report published by China's Ministry of Commerce indicated that ECFA would boost China's GDP by 0.36–0.4% (Ministry of Commerce, 2011), while the simulation results provided by Rosen and Wang (2011) suggested that ECFA might raise real GDP in Taiwan by 4.4% by 2020. There has so far been a dearth of studies examining the potential impact of a cross-strait agreement on trade in goods. The aim of the present study is therefore to analyze the state of competition and cooperation in cross-strait trade between Taiwan and China, and to explore possible strategies for cross-strait tariff reduction, so as to fill this gap in the literature.

As the main emphasis in the planned agreement on trade in goods will be on lowering the import duty rates applying to bilateral trade between Taiwan and China, and on enhancing the two countries' competitiveness, the effects will mainly be confined to local market opening. The framework for analysis is based on the concept of "revealed comparative advantage" developed by Bela Balassa. The index of revealed comparative advantage stands as the most widely used tool in detecting comparative advantages of a country in particular sectors (Serin and Civan, 2008). In the light of an increasingly competitive international environment, each side of cross-strait will decide how far it is willing to reduce tariff rates based on export competitiveness, and therefore takes export competitiveness indicators for Taiwan and China as the main element in the analysis. That is to say, a high level of export competitiveness is assumed to imply a higher level of willingness to reduce tariffs, and thus to lead to greater, faster tariff reductions. By contrast, a low level of export competitiveness is assumed to imply a lower ability to bear the impact of market opening, and thus to smaller tariff reductions, or even a refusal to make tariff reductions at all. The next section of this paper discusses the form taken by the interaction and competition between Taiwan and China in cross-strait trade, and seeks to analyze the impact of bilateral trade liberalization on industry. This is followed by the establishment of a number of trade indicators to explore possible strategies for tariff reduction; the study's conclusions are presented in the final section.

2. Competition in Cross-Strait Trade

Taiwan's main trading partners are China, Hong Kong, the ten ASEAN member nations, the U.S., and member states of the European Union; China's main trading partners are the EU, the U.S., Hong Kong, ASEAN, and Japan. There are thus a number of important export markets with respect to which Taiwan and China find themselves in competition with each other. Any attempt to analyze the liberalization of cross-strait trade between Taiwan and China needs to be preceded by an examination of

their respective competitiveness in terms of international trade and the nature of the trade interactions between them. A clear and consistent classification between international trade in goods and related industries is needed to conduct strategies simulation for tariff reduction. Since political stability has significant impact on cross-Strait economic relation, therefore, to explore cross-country and cross-industry competitiveness, the empirical data used in the present study are taken from a political stable period (2009–2011) average of two-digit HS tariff code compiled by the Taiwanese and Chinese customs authorities.⁷ More disaggregate data cause the problem of classification. Therefore, a two-digit HS code is used.⁸

The present study uses the revealed comparative advantage index (RCA index) to evaluate the export competitiveness of Taiwanese and Chinese industry in overseas markets. The RCA index was first proposed by Bela Balassa (1965). It measures the comparative advantage of a particular industry in international markets as compared to other industries in the same country, assuming there is no change in the available production

resources. The RCA index is defined as follows:
$$RCA_i^k = \frac{X_i^k / X_w^k}{X_i / X_w}$$
 where X_i^k

denotes the exports of product k by country i ; X_w^k denotes total global exports of product k ; X_i denotes total global exports of country i ; and X_w denotes total global exports of all products.

Where the RCA value is greater than or equal to zero, then the greater the RCA value the more suited the country's existing production resources are towards production in that particular industry, and the greater the comparative advantage that industry enjoys relative to the same industry in other countries, i.e., the greater the international export competitiveness of that industry (Bowen, 1983). Following the RCA classification scheme

Table 2
RCA value classification

<i>Export Competitiveness Level</i>	<i>RCA Value</i>
Very strong export competitiveness	RCA value greater than or equal to 2.5
Strong export competitiveness	RCA value greater than or equal to 1.25 but less than 2.5
Moderate export competitiveness	RCA value greater than or equal to 0.8 but less than 1.25
Weak export competitiveness	RCA value less than 0.8

Source: JETRO (Japan External Trade Organization) (1977) White Paper on International Trade.

devised by the Japan External Trade Organization (JETRO), different RCA value levels have been taken to indicate various levels of export competitiveness, as shown in Table 2 below (Tuan and Ng, 1998; Han *et al.*, 2009).

As shown in Table 3, both Taiwan and China enjoy a competitive advantage in international markets with respect to the hand-tool and miscellaneous articles of base metal, the electromechanical equipment, glass and glassware, articles of iron and steel, and the musical instruments manufacturing industries; as a result, they are engaged in intense competition with one another with respect to these industries. With regard to the textile industry, although both countries enjoy a competitive advantage in this industry, Taiwan's competitive advantage is stronger than China's. In the plastics industry and iron and steel industry, China is not really in a position to compete effectively against Taiwan in international markets. On the other hand, in the case of labor-intensive and resource-intensive industries, such as leather and leather goods, garments and miscellaneous textiles, shoes, hats, umbrellas, stone and ceramic products, machinery, shipbuilding, furniture, and toys and miscellaneous manufactured articles, China is significantly more internationally competitive than Taiwan.

Table 3
RCA and export competitiveness of Taiwan and China

<i>HS Tariff Code</i>	<i>Industry</i>	<i>Taiwan's RCA</i>	<i>Taiwan's Export Competitiveness</i>	<i>China's RCA</i>	<i>China's Export Competitiveness</i>
01-05	Live animals and animal products	0.33	Weak	0.40	Weak
06-14	Vegetable products	0.07	Weak	0.41	Weak
15-24	Prepared foodstuffs	0.11	Weak	0.35	Weak
25-27	Mineral products	0.46	Weak	0.15	Weak
28-38	Chemical products	0.73	Weak	0.49	Weak
39	Plastics	2.19	Strong	0.67	Weak
40	Rubber	0.81	Moderate	0.79	Weak
41-43	Leather and articles thereof	0.53	Weak	2.34	Strong
44-46	Wood and articles thereof, cork and articles of cork, and manufactures of straw or other plaiting materials	0.10	Weak	0.94	Moderate
47-49	Paper products	0.35	Weak	0.44	Weak
50-60	Textiles	2.39	Strong	2.23	Strong
61-63	Garments and miscellaneous textiles	0.16	Weak	3.56	Very strong

contd. table 3

<i>HS Tariff Code</i>	<i>Industry</i>	<i>Taiwan's RCA</i>	<i>Taiwan's Export Competitiveness</i>	<i>China's RCA</i>	<i>China's Export Competitiveness</i>
64	Footwear	0.18	Weak	3.43	Very strong
65–67	Hats and umbrellas	0.54	Weak	5.20	Very strong
68–69	Stone and ceramic products	0.21	Weak	1.96	Strong
70	Glass and glassware	1.43	Strong	1.45	Strong
71	Precious stones and precious metals	0.43	Weak	0.33	Weak
72	Iron and steel	1.45	Strong	0.64	Weak
73	Articles of iron or steel	1.28	Strong	1.41	Strong
74–81	Metal products	0.89	Moderate	0.61	Weak
82–83	Hand tools and miscellaneous articles of base metal	1.80	Strong	1.57	Strong
84	Machinery and parts thereof	0.75	Weak	1.44	Strong
85	Electrical machinery and equipment and parts thereof	2.57	Very strong	1.72	Strong
86	Railway locomotives, rolling-stock and parts thereof	0.03	Weak	2.22	Strong
87	Cars and motorcycles	0.39	Weak	0.31	Weak
88	Aircraft	0.07	Weak	0.05	Weak
89	Ships	0.34	Weak	1.99	Strong
90	Optical instruments and parts thereof	2.34	Strong	0.94	Moderate
91	Clocks and watches	0.09	Weak	0.70	Weak
92	Musical instruments	1.81	Strong	2.07	Strong
93	Arms and ammunition	0.17	Weak	0.08	Weak
94	Furniture	0.52	Weak	2.61	Very strong
95–96	Toys and miscellaneous manufactured articles	1.13	Moderate	2.91	Very strong
97	Works of art	0.01	Weak	0.10	Weak

Note: Export competitiveness ratings of “strong” or higher are highlighted using a gray background.

RCA is base on the average trade value for 2009–2011.

Source: Compiled and calculated by the authors from *World Trade Atlas* (2009–2011).

3. The Impact of the Liberalization of Bilateral Cross-Strait Trade on Industry

As can be seen from the aforementioned analysis, as a result of the differences that exist between Taiwan and China in terms of the level of economic development reached and the availability of resources, in most industries either Taiwan or China enjoys a significantly higher degree of competitive advantage than the other in international markets, but there are a handful of industries where the two sides are in direct competition.

However, investment and trade activity has driven the formation of close collaborative relationships between Taiwanese and Chinese industry, so any attempt to examine the impact of the liberalization of cross-Strait trade requires a clarification of the state of competition that Taiwanese firms face in the Chinese market and vice versa, as well as of the intra-industry division of labor; only then can one hope to gain a clearer understanding of the two sides' export structure and relative competitiveness.

The product concentration coefficient is a value ranging between zero and one. The more heavily a country's exports (or imports) are concentrated in a particular industry, the higher the product concentration coefficient. The product concentration coefficient (C) is defined as:

$$C_x = \sqrt{\sum_{i=1}^n (X_i/X)^2} \times 100 \quad \text{or} \quad C_m = \sqrt{\sum_{i=1}^n (M_i/M)^2} \times 100$$

where X_i (M_i) denotes the exports (imports) of product i by the country; and X (M) denotes total global exports (imports) of all products. According to customs data from *World Trade Atlas*, in 2011, Taiwan's exports to China (excluding Hong Kong) accounted for 26.8% of Taiwan's total exports, while its imports from China accounted for 15.5% of total imports. The product concentration coefficient for Taiwanese exports to China is 0.41, while for Taiwan's imports from China it is 0.44. These data imply that both Taiwan's exports to China, and its imports from China, are concentrated in a relatively small number of product categories.

The intensity of trade index (I_{ij}) is defined as follows;

$$I_{ij} = \frac{X_{ij}/X_i}{M_j/(M_w - M_i)}$$

where X_{ij} denotes country i 's exports going to country

j ; X_i denotes country i 's total exports; M_j denotes country j 's total imports; M_i denotes country i 's total imports; and M_w denotes total global imports. If the trade intensity index is greater than one, this indicates a high level of trade linkage, when measured by exports. The level of intensity shows the proportion of exports of country i that goes to country j weighted by the global share of imports for country j . Taiwan also displays a high level of trade dependency on China; Taiwan's trade intensity index (Anderson and Norheim, 1993) with respect to its exports to China is 2.5.¹⁰

The export dependency ratio or import dependency ratio (DR) can be

defined as follows: $DR_{ij} = \frac{X_{ij}}{X_j} = \frac{M_{ij}}{M_j}$ where X_{ij} (M_{ij}) denotes the exports

(imports) of country i to country j ; and X_j (M_j) denotes the global exports (imports) by country j . Looking at the relationship from China's point of view, China's rapid economic development has led to a steady increase in both the size of the Chinese market and the overall scale of China's exports. As a result, the share of China's total foreign trade held by trade with Taiwan has gradually fallen over time. China's export dependency ratio and import dependency ratio with respect to Taiwan fell from 2.1% and 11%, respectively, in 2006 to 1.85% and 7.2% in 2011. China's trade intensity index with respect to its exports to Taiwan stood at 0.96 in 2011, indicating that China's trade dependency on the Taiwan market is lower than Taiwan's dependency on the China market. This situation is related to the vertical division of labor that exists between Taiwanese and Chinese industry. Taiwanese firms supply upstream materials and intermediates, and make use of China's land and other resources to undertake processing operations in China; the finished products are then exported to the North American and European markets. This means that China is an important export market for Taiwan, while for China it is North America and Europe that are the important export markets. Given the relatively small size of the Taiwanese economy, it is inevitable that Taiwan's share of China's total foreign trade will be low, hence the small share of China's total exports held by the Taiwan market. However, viewed in terms of the cross-Strait division of labor in industry that exists between Taiwan and China, the close trading relationship between the two sides is actually of considerable importance to both Taiwan and China.

To gain a clearer understanding of the state of competition in individual industries, we analyze the export competitiveness of individual industries in the other market (China or Taiwan, as the case may be), and also in other countries around the world; the aim here is to clarify how competitive individual Taiwanese industries are in China, and vice versa. We also examine the similarities and differences in export structure, which can help to indicate which industries are likely to be most affected by the liberalization of trade between Taiwan and China (Chen *et al.*, 2009).¹¹

(1) Trade Competition between Taiwan and China

We begin our analysis by looking at the competitiveness of Taiwanese industries in the China market. The regional revealed comparative

advantage (RRCA) index (Richardson and Zhang, 2001) is used to compare the competitiveness of Taiwanese industries in the China market compared to the industries of other countries. The regional revealed comparative advantage (RRCA) index is based on the Revealed Comparative Advantage (RCA) index proposed by Bela Balassa, but examines comparative advantage in a particular regional market, rather than the global market as

a whole. The RRCA can be defined as follows:
$$RRCA_{ij} = \frac{\frac{X_{ij}^k}{X_{ij}}}{\frac{X_{rj}^k}{X_{rj}}} \text{ where } X_{ij}^k$$

denotes the exports of product k of country i to country j; X_{ij}^k denotes total regional exports of product k by country j; X_{ij} denotes the total exports of country i to country j; and X_{rj} denotes total regional exports by country j.

The results obtained in Table 4 show that Taiwan's plastics, textile, iron and steel, hand tools and miscellaneous articles of base metal, optical instruments, musical instruments, chemical products, precious stones and precious metals, glass, shipbuilding and toys and miscellaneous manufactured articles industries all enjoy either strong or very strong export competitiveness in the China market. The 18 industries in which Taiwan displays weak export competitiveness in international markets (see Table 3) – live animals and animal products, vegetable products, prepared foodstuffs, mineral products, leather and articles thereof, wood and articles thereof, paper products, garments and miscellaneous textiles, hats and umbrellas, precious stones and precious metals, machinery, railway locomotives and rolling stock, cars and motorcycles, aircraft, clocks and watches, arms and ammunition, furniture, and works of art – also display poor export competitiveness in the China market.

The industries where Taiwan's export performance in the China market are superior to its export performance in international markets¹² are the optical instruments and shipbuilding industries; these industries have very strong export competitiveness with respect to the China market, but only strong or weak export competitiveness with respect to international markets. Taiwan's chemical products, stone and ceramic products industries display weak export competitiveness with respect to international markets, but strong export competitiveness with respect to the China market, while the toys and miscellaneous manufactured articles industry displays moderate export competitiveness with respect to international markets, but strong

export competitiveness with respect to the China market. On the other hand, Taiwan's electrical machinery and equipment, articles of iron and steel industries have lower export competitiveness in the China market than in international markets (moderate, as compared to very strong or strong), as do the rubber industry (which displayed moderate export competitiveness in international markets, but only weak competitiveness in the China market) (see Table 4).

Table 4
RRCA and export competitiveness of Taiwanese and Chinese industries,

<i>HS Tariff Code</i>	<i>Industry</i>	<i>Taiwan's RRCA</i>	<i>Taiwan's Export Competitiveness in the China Market</i>	<i>China's RRCA</i>	<i>China's Export Competitiveness in the Taiwan Market</i>
01-05	Live animals and animal products	0.20	Weak	2.02	Strong
06-14	Vegetable products	0.02	Weak	0.55	Weak
15-24	Prepared foodstuffs	0.18	Weak	0.77	Weak
25-27	Mineral products	0.06	Weak	0.12	Weak
28-38	Chemical products	2.05	Strong	1.09	Moderate
39	Plastics	2.37	Strong	0.80	Weak
40	Rubber	0.46	Weak	0.86	Moderate
41-43	Leather and articles thereof	0.54	Weak	0.98	Moderate
44-46	Wood and articles thereof, cork and articles of cork, and manufactures of straw or other plaiting materials	0.05	Weak	1.05	Moderate
47-49	Paper products	0.37	Weak	1.06	Moderate
50-60	Textiles	1.80	Strong	2.03	Strong
61-63	Garments and miscellaneous textiles	0.46	Weak	4.26	Very strong
64	Footwear	1.16	Moderate	2.78	Very strong
65-67	Hats and umbrellas	0.51	Weak	12.46	Very strong
68-69	Stone and ceramic products	1.29	Strong	2.43	Strong
70	Glass and glassware	2.16	Strong	0.45	Weak
71	Precious stones and precious metals	0.09	Weak	0.33	Weak
72	Iron and steel	1.38	Strong	1.04	Moderate
73	Articles of iron and steel	0.85	Moderate	2.82	Very strong
74-81	Metal products	0.80	Weak	0.61	Weak
82-83	Hand tools and miscellaneous articles of base metal	1.79	Strong	2.48	Strong
84	Machinery and parts thereof	0.72	Weak	1.25	Strong
85	Electrical machinery and equipment and parts thereof	1.20	Moderate	1.54	Strong

contd. table 4

<i>HS Tariff Code</i>	<i>Industry</i>	<i>Taiwan's RRCA</i>	<i>Taiwan's Export Competitiveness in the China Market</i>	<i>China's RRCA</i>	<i>China's Export Competitiveness in the Taiwan Market</i>
86	Railway locomotives, rolling stock and parts thereof	0.02	Weak	7.60	Very strong
87	Cars and motorcycles	0.15	Weak	1.04	Moderate
88	Aircraft	0.00	Weak	0.10	Weak
89	Ships	2.70	Very strong	0.26	Weak
90	Optical instruments and parts thereof	3.61	Very strong	1.67	Strong
91	Clocks and watches	0.03	Weak	0.18	Weak
92	Musical instruments	1.57	Strong	2.46	Strong
93	Arms and ammunition	0.26	Weak	0.08	Weak
94	Furniture	0.69	Weak	4.64	Very strong
95–96	Toys and miscellaneous manufactured articles	1.64	Strong	2.96	Very strong
97	Works of art	0.09	Weak		N/A

Note: Export competitiveness ratings of “strong” or higher are highlighted using a gray background.

RRCA is based on the three-year average of trade value for 2009–2011.

Source: Compiled and calculated by the authors from *World Trade Atlas* (2009–2011).

We now go on to consider the export competitiveness of China's industries with respect to the Taiwan market. China's textiles, garment and miscellaneous textiles, footwear, hat and umbrella, stone and ceramic products, articles of iron and steel, hand tools and miscellaneous articles of base metal, machinery, electrical machinery, musical instruments, furniture, toys and miscellaneous manufactured articles, live animals and animal products, railway locomotives and rolling stock, and optical instruments industries all display higher export competitiveness in the Taiwan market. China's vegetable products, prepared foodstuffs, mineral products, plastics, precious stones and precious metals, iron and steel, metal products, aircraft, clocks and watches, arms and ammunition and works of art industries all display weak export competitiveness in both the Taiwan market and international markets.

Chinese industries that have higher export competitiveness in the Taiwan market than in international markets include the paper products, chemical products, rubber, live animals and animal products, car and motorcycle, railway locomotives and rolling stock, and optical instruments industries. The live animals and animal products industry is particularly competitive in the Taiwan market. However, the Chinese leather, glass and shipbuilding industries display lower competitiveness in Taiwan than in

international markets; in particular, the glass and shipbuilding industries are industries where China is very competitive in international markets, but displays only weak export competitiveness in the Taiwan market.

(2) Similarities and Differences between the Export Structures of Taiwan and China

In this section, we seek to measure the similarities and differences between the export structure of Taiwan and China, so as to acquire a clearer picture of the structure of their respective exporter industries. We make use of the import-export similarity index developed by Michaely (1984).

$$D_{ij} = \sum_{k=1}^n \left| \frac{X_{ij}^k}{X_{ij}} - \frac{M_{ij}^k}{M_{ij}} \right|, \text{ where } X_{ij}^k \text{ denotes the value of country } i\text{'s industry } k$$

exports to country j ; M_{ij}^k denotes the value of country i 's industry k imports from country j ; M_{ij} denotes the value of country i 's total imports from country j ; and X_{ij} denotes the value of country i 's total exports to country j .

The larger the index value, the greater the disparity between the products that a particular country or region exports and the products it imports. If there is no overlap whatsoever between the products that a country exports and the products it imports, then the value of the Michaely index will be two; if the products that a country exports and the products it imports are exactly the same, then the value of the Michaely index will be zero.

Table 5 shows the Michaely index values for individual industries for Taiwan and China, using two-digit HS tariff code categories. The figures reveal that, for 16 industries – live animals and animal products, plastics, paper products, hats and umbrellas, glass and glassware, precious stones and precious metals, hand tools and miscellaneous articles of base metal, machinery, electrical machinery and equipment, cars and motorcycles, aircraft, shipbuilding, optical instruments, musical instruments, arms and ammunition, furniture and works of art – Taiwan's Michaely index with respect to China is lower than the average for all industries, indicating that the products being imported and exported in these industries display a high level of similarity, compared to the average for industry as a whole. This implies that, for Taiwan, the liberalization of cross-Strait trade will have a pronounced, direct impact on these industries.

From China's point of view, there are 14 industries – live animals and animal products, plastics, rubber, paper products, glass and glassware, precious stones and precious metals, hand tools and miscellaneous articles

Table 5
Import – export similarity index (Michaely index) for Taiwan and China,

<i>HS Tariff Code</i>	<i>Industry</i>	<i>Import – Export Similarity Index (Taiwan)</i>	<i>Import – Export Similarity Index (China)</i>
01–05	Live animals and animal products	1.3 (Similar)	1.03 (Similar)
6–14	Vegetable products	1.68 (Dissimilar)	1.71 (Dissimilar)
15–24	Prepared foodstuffs	1.35 (Dissimilar)	1.62 (Dissimilar)
25–27	Mineral products	1.87 (Dissimilar)	1.78 (Dissimilar)
28–38	Chemical products	1.56 (Dissimilar)	1.54 (Dissimilar)
39	Plastics	1.18 (Similar)	1.17 (Similar)
40	Rubber	1.48 (Dissimilar)	1.19 (Similar)
41–43	Leather and articles thereof	1.77 (Dissimilar)	1.89 (Dissimilar)
44–46	Wood and articles thereof, cork and articles of cork, and manufactures of straw or other plaiting materials	1.4 (Dissimilar)	1.4 (Dissimilar)
47–49	Paper products	1.23 (Similar)	1.29 (Similar)
50–60	Textiles	1.55 (Dissimilar)	1.48 (Dissimilar)
61–63	Garments and miscellaneous textiles	1.4 (Dissimilar)	1.36 (Dissimilar)
64	Footwear	1.71 (Dissimilar)	1.63 (Dissimilar)
65–67	Hats and umbrellas	1.33 (Similar)	1.45 (Dissimilar)
68–69	Stone and ceramic products	1.56 (Dissimilar)	1.61 (Dissimilar)
70	Glass and glassware	1.15 (Similar)	1.15 (Similar)
71	Precious stones and precious metals	1.3 (Similar)	1.17 (Similar)
72	Iron and steel	1.57 (Dissimilar)	1.54 (Dissimilar)
73	Articles of iron and steel	1.44 (Dissimilar)	1.44 (Dissimilar)
74–81	Metal products	1.57 (Dissimilar)	1.56 (Dissimilar)
82–83	Hand tools and miscellaneous articles of base metal	1.14 (Similar)	1.07 (Similar)
84	Machinery and parts thereof	1.11 (Similar)	1.11 (Similar)
85	Electrical machinery and equipment and parts thereof	0.8 (Similar)	0.93 (Similar)
86	Railway locomotives, rolling-stock and parts thereof	1.51 (Dissimilar)	0.07 (Similar)
87	Cars and motorcycles	1.09 (Similar)	0.92 (Similar)
88	Aircraft	0.43 (Similar)	1.58 (Dissimilar)
89	Ships	1.89 (Dissimilar)	1.88 (Dissimilar)
90	Optical instruments and parts thereof	0.77 (Similar)	0.58 (Similar)
91	Clocks and watches	1.61 (Dissimilar)	1.55 (Dissimilar)
92	Musical instruments	1.11 (Similar)	1.15 (Similar)
93	Arms and ammunition	0.89 (Similar)	1.96 (Dissimilar)
94	Furniture	1.19 (Similar)	1.31 (Dissimilar)
95–96	Toys and miscellaneous manufactured articles	1.46 (Dissimilar)	1.42 (Dissimilar)
97	Works of art	0.82 (Similar)	0 (Similar)

Notes: 1. The “works of art” industry was excluded, because China’s import–export similarity index value for this industry was infinite.

2. An import-export similarity index value that is greater than the average value (1.34 for Taiwan and 1.31 for China) is taken to indicate dissimilarity; other values are taken to indicate similarity.

Source: Compiled and calculated by the authors from *World Trade Atlas* (2009–2011).

of base metal, machinery, electrical machinery and equipment, railway locomotives and rolling stock, cars and motorcycles, optical instruments, musical instruments and works of art – for which China's Michaely index with respect to Taiwan is lower than the average for all industries; here again, this implies that these Chinese industries may experience a direct negative impact once the restrictions on cross-Strait trade between Taiwan and China are lifted. Of course, the scope of products covered here within each industry is very broad, and may include upstream and downstream products related to other industries, in which case the liberalization of cross-Strait trade might in fact make some industries more competitive by reducing the cost of intermediates.

4. Tariff Reduction Strategy Selection

In the present study, in selecting the tariff reduction model, we distinguish between three types of tariff reduction (based on typical agreements on trade in goods), namely, immediate implementation of a zero tariff rate, reduction of the tariff rate, and "other". Reduction of the tariff rate can be further sub-divided into the following categories: (1) Immediate reduction of the tariff rate to the target level. (2) Decremental reduction of the tariff rate, whereby the reduction implemented in the first year is the largest, followed by successively smaller reductions in the following years. (3) Averaged reduction, whereby the reduction of the tariff rate is equalized out over several years. (4) Incremental reduction, whereby a small reduction is implemented in the first year, followed by steadily larger reductions in the following years, with the biggest reduction being implemented in the final year. (5) Delayed reduction, whereby tariff reductions are not implemented until another country's tariff rates have fallen below the level applying in one's own country. With the first of these sub-categories, if the target tariff rate is zero, then this sub-category could effectively be the same as the immediate implementation of a zero tariff rate category. For this reason, in the following analysis, five strategic options are used: O1 – Immediate reduction of the tariff rate to the target level (which could be zero); O2 – Decremental reduction of the tariff rate; O3 – Averaged reduction of the tariff rate; O4 – Incremental or delayed reduction of the tariff rate; and O5 – Maintaining the status quo.

The choice of tariff reduction strategy will depend on a country's competitiveness. This competitiveness includes export competitiveness in international markets, which can be used to gauge average export competitiveness for individual industries. However, the fact that a given country has significant export competitiveness with respect to international markets does not necessarily imply that it has export competitiveness with

respect to the country with which it is negotiating the trade agreement, since the demands of individual markets vary depending on their level of economic development and the product mix of their industries. At the same time, the relative competitiveness of the two countries in each other's markets and the product mix of their export-oriented industries will also affect the state of competition between them and the nature of the competitive/collaborative relationship that exists between them, thereby affecting the choice of strategies adopted during trade agreement negotiations.

For example, if one particular industry has high export competitiveness with respect to both international markets and the trading partner's market, then with regard to the competition between the two countries in each other's market, if the home country's industry and the trading partner country's industry both possess a competitive advantage, while at the same time the two countries' industries have different export structures, then this implies that the home country's industry possesses a competitive advantage in both international markets and the trading partner's market, while the two countries are at the same time exporting different products. This means that, as soon as trade between the two countries is liberalized, the home country's industry will possess a competitive advantage, and is less likely to face intense competition; for this category of industry, the preferred tariff reduction model is likely to be either O1 or O2, the more "open" models. If, on the other hand, neither the home country nor the trading partner country possesses export competitiveness in a given industry, and the two countries' export product mixes are similar, this implies that, although the home country's industry may possess export competitiveness in international markets and in the trading partner's market, it will be at a disadvantage compared to the trading partner country in terms of its performance in the trading partner's market. This means that tariff reductions will be relatively less beneficial for the home country; if the two countries also have a similar export product mix, then as soon as restrictions on trade are removed there is a strong possibility that the home country's industry may find itself facing intense competition. The preferred tariff model for industries in this category is thus likely to be one of O2 to O5.

As regards the logic behind the basic framework for the selection of negotiating strategy options, this can be explained in the form of a five-step process. In the first step, one needs to consider the international export competitiveness of the home country. The RCA index is then used to gauge the international export competitiveness of each country, which is then assigned to a class based on the standard RCA export competitiveness

classes developed by the Japan External Trade Organization (JETRO). As can be seen from Table 2, industries with strong or very strong export competitiveness (i.e., an RCA greater than or equal to 1.25) all possess a pronounced comparative advantage, so the selection of negotiating strategies with respect to these industries should emphasize an active, open approach to liberalization.

We then need to consider the possibility that, with respect to bilateral trade, an industry's international competitiveness (as determined using RCA) may vary due to factors that are not related to production resources, such as geographical or historical factors. This means that we need to acquire a clearer understanding of the competitiveness of the home country's industry and of the relative competitiveness of individual industries with respect to the trading partner's market, when the market in which competition is taking place is limited to the trading partner's market. In steps two and three, therefore, we assume that the market where competition is taking place is the trading partner's market, and then examine the regional revealed comparative advantage (RRCA) index of the two countries' industries, together with the RRCA of the home country and the trading partner country with respect to individual industries. Examination of the RRCA index and comparison of the differential values of the two countries' RRCA indexes can clearly show the relative strength or weakness of the home country and the trading partner country in a particular industry.

In the present study, the standard RCA export competitiveness classes developed by JETRO are applied to the RRCA index. As regards RRCA differential values, if the RRCA differential value for a given industry is greater than or equal to two, or in other words where the first country's RRCA value is greater than or equal to that of the other country, then this indicates that the home country possesses a competitive advantage in that industry relative to the trading partner country; if the RRCA differential value for a given industry is less than two, or in other words where the home country's RRCA value is smaller than that of the trading partner country, then this indicates that the trading partner country possesses a competitive advantage relative to the home country in that industry. If the RRCA value for a given industry falls between 0.5 and 2, then both countries can be deemed to possess a competitive advantage.

Having compared the export competitiveness of the two countries' industries, the next step is to consider the intensity of the competition that each country's industry will be exposed to once trade liberalization takes effect. The more similar a country's export product mix is to that of the other country, then the fiercer the competition that the two countries' industries will be exposed to after trade liberalization. Under these

circumstances, it makes sense for countries to adopt a more conservative strategy when negotiating trade liberalization. We use the home country's import-export similarity index (Michaely index), making use of the index value for all of the country's industries combined as the measurement standard. If the Michaely index value for a given industry is higher than the average Michaely index value for all industries, this indicates that the export product mix in that industry is unlike that in the trading partner country, implying that neither country is likely to experience an intensification of competition following trade liberalization. On the other hand, if the Michaely index value for a given industry is lower than the average Michaely index value for all industries, then an intensification of competition can be expected after trade liberalization takes effect.

In step five, possible tariff reduction models are selected on the basis of the trade indicator categories outlined above. Basically, the greater a home country's export competitiveness, and the better its performance in the trading partner's market, where the two countries have a different export product mix in the industry in question, once trade liberalization has taken effect the home country's industry can expect to achieve greater benefits in terms of export performance, and the likelihood of it being exposed to intense competition will be lower. In this situation, the home country may wish to adopt a more aggressive, open strategy with respect to the tariff reduction model. On the other hand, the lower a home country's export competitiveness, and the worse its performance in the trading partner's market, where the two countries have a similar export product mix in the industry in question, once trade liberalization has taken effect, the home country's industry is less likely to achieve significant benefits in terms of export performance, and the likelihood of it being exposed to intense competition will be higher. In this situation, the home country may wish to adopt a more conservative strategy with respect to the tariff reduction model.

Using the analytical framework outlined above and customs statistics of Taiwan and China, the tariff reduction models most suited to individual Taiwanese and Chinese industries have been determined, and are presented in Tables 6 and 7. The results of collated trade indicator analysis (i.e., the RCA index, RRCA index, and Michaely index) in Table 6 show that, for Taiwan, it would be advisable to adopt an aggressive tariff reduction strategy (O1) with respect to the plastics, the textile, the glass and glassware, the iron and steel, the optical instruments, and toys and miscellaneous manufactured articles. For the live animals and animal products, the paper products, the hats and umbrellas, the precious stones and precious metals, the car and motorcycle, the aircraft, and the furniture, Taiwan should adopt a more conservative strategy (O5).

Table 6
Tariff reduction models – Taiwanese industry

HS Tariff Code	Industry	Step One: International Export Competitiveness of the Taiwanese Industry	Step Two: Export Competitiveness of the Taiwanese Industry in China	Step Three: Relative Advantage/ Disadvantage of the Taiwanese Industry Compared to its Chinese Counterpart	Step Four: Similarity of the Two Countries' Export Product Mix	Step Five: Recommended Negotiating Strategy
1-5	Live animals and animal products	Weak	Weak	Relative disadvantage	Similar	O5
6-14	Vegetable products	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
15-24	Prepared foodstuffs	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
25-27	Mineral products	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
28-38	Chemical products	Weak	Strong	Parity	Dissimilar	O3, O4
39	Plastics	Strong	Strong	Relative advantage	Similar	O1, O2
40	Rubber	Moderate	Weak	Parity	Dissimilar	O2-O4
41-43	Leather and articles thereof	Weak	Weak	Parity	Dissimilar	O3-O5
44-46	Wood and articles thereof, cork and articles of cork, and manufactures of straw or other plaiting materials	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
47-49	Paper products	Weak	Weak	Relative disadvantage	Similar	O5
50-60	Textiles	Strong	Strong	Parity	Dissimilar	O1, O2
61-63	Garments and miscellaneous textiles	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
64	Footwear	Weak	Moderate	Relative disadvantage	Dissimilar	O3, O4
65-67	Hats and umbrellas	Weak	Weak	Relative disadvantage	Similar	O5
68-69	Stone and ceramic products	Weak	Strong	Parity	Dissimilar	O3, O4
70	Glass and glassware	Strong	Strong	Relative advantage	Similar	O1, O2
71	Precious stones and precious metals	Weak	Weak	Relative disadvantage	Similar	O5
72	Iron and steel	Strong	Strong	Parity	Dissimilar	O1, O2
73	Articles of iron and steel	Strong	Moderate	Relative disadvantage	Dissimilar	O2-O4

contd. table 6

HS Tariff Code	Industry	Step One: International Export Competitiveness of the Taiwanese Industry	Step Two: Export Competitiveness of the Taiwanese Industry in China	Step Three: Relative Advantage/ Disadvantage of the Taiwanese Industry Compared to its Chinese Counterpart	Step Four: Similarity of the Two Countries' Export Product Mix	Step Five: Recommended Negotiating Strategy
74–81	Metal products	Moderate	Weak	Parity	Dissimilar	O2–O4
82–83	Hand tools and miscellaneous articles of base metal	Strong	Strong	Parity	Similar	O2–O4
84	Machinery and parts thereof	Weak	Weak	Parity	Similar	O3–O5
85	Electrical machinery and equipment and parts thereof	Very strong	Moderate	Parity	Similar	O2–O4
86	Railway locomotives, rolling-stock and parts thereof	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
87	Cars and motorcycles	Weak	Weak	Relative disadvantage	Similar	O5
88	Aircraft	Weak	Weak	Relative disadvantage	Similar	O5
89	Ships	Weak	Very strong	Relative advantage	Dissimilar	O2–O4
90	Optical instruments and parts thereof	Strong	Very strong	Relative advantage	Similar	O1, O2
91	Clocks and watches	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
92	Musical instruments	Strong	Strong	Parity	Similar	O2–O4
93	Arms and ammunition	Weak	Weak	Relative advantage	Similar	O4, O5
94	Furniture	Weak	Weak	Relative disadvantage	Similar	O5
95–96	Toys and miscellaneous manufactured articles	Moderate	Strong	Parity	Dissimilar	O1, O2
97	Works of art	Weak	Weak	N/A	Similar	N/A

Notes: 1. The “works of art” industry was excluded, because China’s RRCA value for this industry was zero.

2. The tariff reduction strategies are defined as follows: O1 – Immediate reduction of the tariff rate to the target level; O2 – Incremental reduction of the tariff rate, whereby the reduction implemented in the first year is the largest, followed by successively smaller reductions in the following years; O3 – Averaged reduction of the tariff rate, whereby the reduction of the tariff rate is equalized out over several years; O4 – Incremental or delayed reduction of the tariff rate, whereby a small reduction is implemented in the first year, followed by steadily larger reductions in the following years, with the biggest reduction being implemented in the final year; O5 – Maintaining the status quo. O1 is the most aggressive market opening strategy, while O5 is the most conservative.

Source: Compiled and calculated by authors from *World Trade Atlas* (2009–2011).

Table 7
Tariff reduction models – Chinese industry

HS Tariff Code	Industry	Step One: International Export Competitiveness of the Chinese Industry	Step Two: Export Competitiveness of the Chinese Industry in Taiwan	Step Three: Relative Advantage/ Disadvantage of the Chinese Industry Compared to its Taiwanese Counterpart	Step Four: Similarity of the Two Countries' Export Product Mix	Step Five: Recommended Negotiating Strategy
1-5	Live animals and animal products	Weak	Strong	Relative advantage	Similar	O3, O4
6-14	Vegetable products	Weak	Weak	Relative advantage	Dissimilar	O3, O4
15-24	Prepared foodstuffs	Weak	Weak	Relative advantage	Dissimilar	O3, O4
25-27	Mineral products	Weak	Weak	Relative advantage	Dissimilar	O3, O4
28-38	Chemical products	Weak	Moderate	Parity	Dissimilar	O3-O5
39	Plastics	Weak	Weak	Relative disadvantage	Similar	O5
40	Rubber	Weak	Moderate	Parity	Similar	O3-O5
41-43	Leather and articles thereof	Strong	Moderate	Parity	Dissimilar	O2-O4
44-46	Wood and articles thereof, cork and articles of cork, and manufactures of straw or other plaiting materials	Moderate	Moderate	Relative advantage	Dissimilar	O1, O2
47-49	Paper products	Weak	Moderate	Relative advantage	Similar	O3, O4
50-60	Textiles	Strong	Strong	Parity	Dissimilar	O1, O2
61-63	Garments and miscellaneous textiles	Very strong	Very strong	Relative advantage	Dissimilar	O1, O2
64	Footwear	Very strong	Very strong	Relative advantage	Dissimilar	O1, O2
65-67	Hats and umbrellas	Very strong	Very strong	Relative advantage	Dissimilar	O1, O2
68-69	Stone and ceramic products	Strong	Strong	Parity	Dissimilar	O1, O2
70	Glass and glassware	Strong	Weak	Relative disadvantage	Similar	O3-O5
71	Precious stones and precious metals	Weak	Weak	Relative advantage	Similar	O4, O5
72	Iron and steel	Weak	Moderate	Parity	Dissimilar	O3-O5
73	Articles of iron and steel	Strong	Very strong	Relative advantage	Dissimilar	O1, O2

cont'd. table 7

HS Tariff Code	Industry	Step One: International Export Competitiveness of the Chinese Industry	Step Two: Export Competitiveness of the Chinese Industry in Taiwan	Step Three: Relative Advantage/ Disadvantage of the Chinese Industry Compared to its Taiwanese Counterpart	Step Four: Similarity of the Two Countries' Export Product Mix	Step Five: Recommended Negotiating Strategy
74-81	Metal products	Weak	Weak	Parity	Dissimilar	O3-O5
82-83	Hand tools and miscellaneous articles of base metal	Strong	Strong	Parity	Similar	O2-O4
84	Machinery and parts thereof	Strong	Strong	Parity	Similar	O2-O4
85	Electrical machinery and equipment and parts thereof	Strong	Strong	Parity	Similar	O2-O4
86	Railway locomotives, rolling-stock and parts thereof	Strong	Very strong	Relative advantage	Similar	O1, O2
87	Cars and motorcycles	Weak	Moderate	Relative advantage	Similar	O3, O4
88	Aircraft	Weak	Weak	Relative advantage	Similar	O3, O4
89	Ships	Strong	Weak	Relative disadvantage	Dissimilar	O2-O4
90	Optical instruments	Moderate	Strong	Relative disadvantage	Similar	O3-O5
91	Clocks and watches	Weak	Weak	Relative advantage	Dissimilar	O3, O4
92	Musical instruments	Strong	Strong	Parity	Similar	O2-O4
93	Arms and ammunition	Weak	Weak	Relative disadvantage	Dissimilar	O3, O4
94	Furniture	Very strong	Very strong	Relative advantage	Dissimilar	O1, O2
95-96	Toys and miscellaneous manufactured articles	Very strong	Very strong	Parity	Dissimilar	O1, O2
97	Works of art	Weak	N/A	N/A	Similar	N/A

Notes: 1. The "works of art" industry was excluded, because China's RRCA value for this industry was zero.

2. The tariff reduction strategies are defined as follows: O1 – Immediate reduction of the tariff rate to the target level; O2 – Incremental reduction of the tariff rate, whereby the reduction implemented in the first year is the largest, followed by successively smaller reductions in the following years; O3 – Averaged reduction of the tariff rate, whereby the reduction of the tariff rate is equalized out over several years; O4 – Incremental or delayed reduction of the tariff rate, whereby a small reduction is implemented in the first year, followed by steadily larger reductions in the following years, with the biggest reduction being implemented in the final year; O5 – Maintaining the status quo. O1 is the most aggressive market opening strategy, while O5 is the most conservative.

Source: Compiled and calculated by authors from *World Trade Atlas* (2009–2011).

As shown in Table 7, simulation of the tariff reduction strategy that China may adopt suggests that plastics industry where Taiwan is likely to adopt a relatively relaxed attitude towards market opening, is the industry with regard to which China is highly likely to adopt a more conservative market opening strategy (O5). The industries with respect to which China can be expected to adopt a very relaxed attitude towards market opening (O1), such as wood and articles thereof, garments and miscellaneous textiles, footwear, hats and umbrellas, stone and ceramic products, railway locomotives and rolling-stock, and furniture, include a number of industries with regard to which Taiwan is likely to adopt a more conservative attitude to market opening. These results give some idea as to where the main focus of the negotiations can be expected to lie.¹³

5. Conclusions

Our analysis of cross-Strait trade statistics clearly shows that, because of China's rapid economic growth, the steady expansion of the size of the Chinese market and the ongoing rise in China's exports, the share of China's total foreign trade held by bilateral trade between China and Taiwan has been falling steadily. At the same time, while China is Taiwan's most important export market, Taiwan is not one of China's biggest export markets. In reality, however, this situation is related to the nature of the vertical division of labor that exists between Taiwanese and Chinese industry, whereby Taiwanese companies ship materials and intermediates to China, and make use of China's land and other resources to manufacture goods in China that are then exported to the European and North American markets.

Our empirical investigation of tariff reduction strategies between Taiwan and China points to a number of salient findings and implications. Owing to differences in their level of industrial development and the resources available to them, there are only a few industries in which Taiwan and China are in direct competition in international markets, while their export performance in each other's markets is superior to their performance in international markets as a whole. Nevertheless, the similarity in the products that Taiwan and China export to each other means that the liberalization of cross-Strait trade will have a negative impact on some industries, including the live animals and animal products, plastics, paper products, hand tools and miscellaneous articles of base metal, machinery, electrical machinery and equipment, cars and motorcycles, optical instruments, and the musical instruments manufacturing industries.

As regards possible tariff reduction strategies, industries with respect to which Taiwan might be advised to adopt a more aggressive, open tariff

reduction strategy include plastics, textiles, glass and glassware, iron and steel, optical instruments, and toys and miscellaneous manufactured articles. Industries with respect to which it might be advisable for China to adopt an aggressive, open tariff reduction strategy include wood and articles thereof, textiles, garments and miscellaneous textiles, footwear, hats and umbrellas, stone and ceramic products, articles of iron and steel, railway locomotives and rolling-stock, furniture, and toys and miscellaneous manufactured articles.

It should be noted that the possible tariff reduction strategies based on export competitiveness that are proposed in the present study reflect only one of the numerous factors that could affect the negotiation strategies adopted by the two sides. The market opening strategies that are actually adopted will be influenced not only by analysis of export competitiveness, but also by other factors such as existing tariff rates, the volume of trade in each particular product category, the state of supply and demand in the domestic market, the current state of development of the industries concerned, the cross-Strait division of labor between Taiwan and China, and the industries that each country feels to be politically sensitive. Economic considerations will not be the only factors affecting the negotiating strategies chosen; political considerations will also exert a major impact. Analysis of the tariff reduction model adopted by China in the negotiation of trade agreements with other countries in the past shows that the strategy China adopts has tended to vary considerably, depending on the identity of the country with which China is negotiating and various political considerations. Given the particularly sensitive nature of the cross-Strait relationship between Taiwan and China, political considerations may lead China to adopt a stiffer attitude towards tariff reduction strategies.

Notes

1. The ASEAN plus three (China, Japan and South Korea) free trade agreements have been formed. Then the USA, China, Japan and South Korea will have a complex network of trade. If Taiwan is absent from this grouping, it will face a serious peripherization crisis.
2. In light of the restrictions that the Taiwanese government places on imports from China, the value of Taiwan's trade with China (excluding Hong Kong) and of Taiwan's trade with Hong Kong is added together to give an overall value for Taiwanese trade with China as a whole.
3. In particular, there has been a marked increase in investment by large enterprises, and the structure of Taiwanese business operations in China has shifted towards the electronics and electrical appliance industries.
4. Although Taiwanese-invested companies in China are, for the most part, still producing mainly for export, there is a growing tendency for various activities to

be localized. Localization is most pronounced in the area of human resources, but there has also been a significant degree of localization in the sourcing of raw materials and components, sales channels, funding sources, marketing activities, and the like.

5. China is developing domestic demand to replace foreign investment to promote its economic growth; this is bound to affect the cross-Strait industrial division of labor, which is not only accelerating the localization of Taiwan businessmen in the mainland, but is also further reducing the link between Taiwan businessmen and their parent companies in Taiwan.
6. China sees the agreement as promoting more commercial relations with Taiwan and better relations overall (Copper, 2010).
7. The customs statistics are taken from *World Trade Atlas*.
8. Six-digit HS classification products can be used to specify the industrial supply chain for the purpose of identifying upstream, midstream and downstream segments.
9. While the financial tsunami caused by the subprime mortgage crisis in the U.S. in 2008 has led to a slower growth of the global economy, the economic growth in China has not been compromised; its economic growth rate was 9.1% in 2009.
10. If the trade intensity index is greater than one, this indicates a high level of trade linkage, when measured by exports.
11. The empirical evidence provided by Chen *et al.* (2009) indicated that cross-Strait trade liberalization is very likely to bring about a win-win situation for both Taiwan and China.
12. For export performance in international markets, see Table 3.
13. The bargain process in Nash cooperative game allows the countries to do inter-country tradeoffs by proposing a joint welfare. For a detailed discussion of cooperative trade game, see Baldwin and Clarke (1987).

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