



## Impact of Cross-Strait Trade Liberalization: A Computable General Equilibrium Analysis

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### Abstract

*This paper applies a computable general equilibrium model to investigate the potential economic effects of trade liberalization across the Taiwan Strait. Our simulation results reveal that cross-Strait trade liberalization will have significant positive impacts on external trade, domestic investment and real GDP for the economies in this area in general and in Taiwan in particular. Furthermore, the negative impact from the formation of a free trade arrangement between Taiwan and Chinese Mainland on Hong Kong seems to be rather small. These results suggest that cross-Strait trade liberalization is very likely to bring about a win-win situation for the economies in this area.*

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**Key words:** cross-Strait, free trade area, free trade arrangement, trade liberalization

**JEL codes:** F13, F15, C68

### I. Introduction

The prolonged political hostility between Taiwan and Chinese Mainland has dramatically changed since Taiwan's new government took office in May 2008 and actively pursued a new economic policy towards Chinese Mainland. Taiwan has recently removed its ban on direct cross-Strait links, and several trade liberalization measures, such as cross-Strait financial cooperation and Chinese Mainland investment in Taiwan, are also under negotiation. Notably, a cross-Strait Economic Cooperation Framework Agreement (ECFA)

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has been proposed, which is under intensive examination by both sides.

The most important driving force behind these dramatic policy changes in Taiwan is the increasing trend of regionalism around the world. The GATT received 124 notifications of RTA during the period 1948–1994, and since the creation of the WTO in 1995, it has received notification of an additional 300 arrangements. Approximately 400 RTA are scheduled to be implemented by 2010. One distinctive feature in the recent trend of RTA is the sharp policy shift from multilateralism to regionalism by many Asian countries, particularly Chinese Mainland.<sup>1</sup> After its accession to the WTO in 2001, China has completed 9 RTA and an additional six RTA were under negotiation by May 2009 (Liu, 2009).

Due to political reasons, however, Taiwan has been excluded in most of the prevailing RTA negotiations around the world. Taiwan, an export-oriented economy, with exports comprising close to 65 percent of GDP in 2008, faces a serious threat of being marginalized. Because Chinese Mainland has already become Taiwan's most important export market as well as destination of its outward investment, recent free trade agreements between Chinese Mainland and its neighboring countries will place Taiwan at a seriously disadvantaged position in the Chinese Mainland market. The signing of an ECFA, therefore, is urged by many enterprises in Taiwan for the sake of coping with "ASEAN Plus One," which takes effect in 2010, as well as "ASEAN Plus Three."<sup>2</sup> Furthermore, it is anticipated that the ECFA might serve as a stepping stone for Taiwan to negotiate free trade arrangements with its major trading partners.

Because direct trade and travel between Taiwan and Chinese Mainland were prohibited for several decades by Taiwan's government for political reasons, Hong Kong has played a significant intermediate role in the cross-Strait economic relationship. The improvement in the economic relationship between Chinese Mainland and Taiwan will inevitably diminish Hong Kong's benefits from its intermediate role in the cross-Strait economic activity. Given the current huge transit trade and investment flows between Taiwan and Chinese Mainland, in response to recent changes in the cross-Strait relationship, the policy options from which Hong Kong can choose are also an important current issue.

The purpose of the present paper is to apply a computable general equilibrium (CGE) model to investigate the economic impact of cross-Strait trade liberalization on Taiwan,

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<sup>1</sup> For instance, Zhang *et al.* (2007), Trakman (2008) and Whalley (2008) reveal possible factors accounting for the recent proliferation of free trade agreements.

<sup>2</sup> "ASEAN Plus One" refers to a free trade arrangement between ASEAN and China and "ASEAN Plus Three" refers to a free trade arrangement between ASEAN, China, Japan and South Korea. Ku (2009) finds that the formation of ASEAN Plus One and ASEAN Plus Three will cause Taiwan's GDP to decrease by 0.176 and 0.836 percent, respectively, in the long run.

Chinese Mainland and Hong Kong. Specifically, because it has been proposed that, given the possible difficulties in negotiating an ECFA whereby a free trade arrangement between Hong Kong and Taiwan could be used as a stepping stone, the present paper examines two scenarios: (i) a free trade arrangement between Taiwan and Hong Kong (THKFTA) prior to an ECFA; and (ii) a free trade arrangement between Chinese Mainland and Taiwan after a THKFTA, referred to as a cross-Strait free trade area (CSFTA) hereafter.

The remainder of this paper is organized as follows. The recent cross-Strait trade and investment relationship is analyzed in Section II, and the empirical model used in this paper is introduced in Section III. The simulation design and empirical results are discussed in Section IV. The final section concludes.

## II. Recent Cross-Strait Trade and Investment Relationship

The political and economic relationship between both sides of the Taiwan Strait has seen dramatic changes since 1987 when Taiwan removed limitations on its people to visit their relatives in Chinese Mainland. Despite cross-Strait political hostility lingering until very recently, informal cross-Strait economic and trade relationships have advanced steadily. Taiwan's exports to Chinese Mainland via Hong Kong increased 15 times from US\$1.515bn in 1987 to US\$22.987bn in 2008.<sup>3</sup> Official estimates from Taiwan indicate that the proportion of cross-Strait trade in Taiwan's overall foreign trade increased from 1.7 percent in 1987 to 21 percent in 2008.<sup>4</sup> Chinese Mainland is now not only Taiwan's most important export market, but also its largest source of trade surplus. Its trade surplus from Chinese Mainland increased from US\$940m in 1987 to US\$42.59bn in 2008.<sup>5</sup> Without this trade surplus, Taiwan would be facing huge trade deficits.

Taiwan's capital outflows toward Chinese Mainland have also increased steadily since the late 1980s after a ban was lifted on outward investment. According to Taiwan's official estimates, accumulated approved investment within Chinese Mainland amounted to 37 181 cases and US\$75.56bn in total in 2008, which was close to 60 percent of Taiwan's total outward direct investment.<sup>6</sup>

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<sup>3</sup> Chinese Mainland Affairs Council (2009), Table 1.

<sup>4</sup> Chinese Mainland Affairs Council (2009), Table 2.

<sup>5</sup> Chinese Mainland Affairs Council (2009), Table 3.

<sup>6</sup> Chinese Mainland Affairs Council (2009), Table 4.

**Table 1. Tax Equivalents of Barriers in Services Trade and Their Impact on Domestic Prices and Costs**

Industry Region	Communication		Financial services		Professional services	
	Output tax (%)		Output tax (%)		Output tax (%)	Cost impact (%)
	Domestic firm	Foreign firm	Domestic firm	Foreign firm	Foreign firm	Domestic firm
Taiwan	0.3	2.4	16.8	11.3	10.7	6.04
Chinese Mainland	2.4	9.8	4.9	27.8	10.4	2.64 <sup>a</sup>
Hong Kong	0.6	0.6	1.8	1.9	8.3	2.64

**Sources:** Dee (2005), Tu *et al.* (2007) and Chou *et al.* (2003).

**Notes:** The estimation of tax equivalents or the cost impact of the barriers in services trade involves two key steps. The first step is to convert qualitative information about regulatory restrictions into a quantitative index, using a priori judgments about the relative restrictiveness of different barriers. The second step is to develop an econometric model and use it to estimate the effect of the services trade restrictiveness index on price, cost, quantity or productivity, while controlling for all the other factors that might affect performance in that industry (Dee, 2005). <sup>a</sup> This parameter is assumed to be the same as that of Hong Kong, as estimated in Chou *et al.* (2003).

in the cross-Strait economic relationship for several decades. With rapid increases in the volume of cross-Strait trade and investment, Hong Kong's trade-transiting status has become increasingly prominent. Trade transit to Chinese Mainland in 1987 accounted for only 27.5 percent of total trade between Taiwan and Hong Kong, but this proportion rose sharply to nearly 73 percent in 2008.<sup>7</sup>

To rescue Hong Kong from an economic recession, the "Closer Economic Partnership Arrangement" (CEPA) between Hong Kong and Chinese Mainland was signed in 2003. It also had some impact on the cross-Strait economic relationship. The main features of the CEPA include liberalization in trade in goods and services, and trade and investment facilitation. As a result of the establishment of the CEPA, Chinese Mainland permitted 273 products originating in Hong Kong to be imported with zero tariffs from 1 January 2004. In addition, nearly 4000 other products also enjoyed zero tariff treatment no later than 1 January 2006. Fung and Zhang (2007) simulate the effects of the CEPA with a CGE model and find that Hong Kong will have significant increases in its exports to China and gains in social welfare at China's expense. Political tension between Taiwan and Chinese Mainland has eased since Taiwan's new government took office in May 2008 and lifted its ban on direct cross-Strait links. Regular cross-Strait flights, cross-Strait financial cooperation and mainland investment in Taiwan are under negotiation. Most importantly, a proposal to

<sup>7</sup> Chinese Mainland Affairs Council (2009), Table 1.

establish a cross-Strait Economic Cooperation Framework Agreement is being intensively studied on both sides. The improvement in the cross-Strait economic relationship has raised heated debate in Taiwan, partly because of its possibly harmful economic effects and partly for political reasons.

From Hong Kong's perspective, the improvement in the cross-Strait economic relationship might bring forth threats as well as opportunities. On the one hand, Hong Kong's transit role will be inevitably weakened by the three direct links. This might inflict some damage on Hong Kong's economy, at least in the short run. On the other hand, in the long run, Hong Kong might benefit from cross-Strait trade liberalization, given Hong Kong's excellent location, sound legal system, as well as competitive strength in the areas of financial services, logistics, professional services, conventions and exhibitions, and tourism.

In summary, closer informal economic integration across the Taiwan Strait has been advancing steadily since the late 1980s, despite political animosity on both sides of the Strait. Cross-Strait political and economic relations have been changing rapidly since the new government of Taiwan adopted a new policy toward Chinese Mainland after the presidential inauguration in May 2008. These changes are expected to have a tremendous impact on the economies in this area and other regions around the world as well. Using a CGE model, the following sections will quantitatively evaluate the possible impacts of these changes.

### III. Empirical Model

Many recent studies have applied a CGE model to investigate the impact of trade policy changes on China. These studies include Wang (2003), Zhang and Fung (2006), Fung and Zhang (2007), Qiu *et al.* (2007) and Park *et al.* (2009). In terms of the impact of RTA, it is known that, in addition to trade creation and trade diversion effects, RTA might bring about international capital movements between member countries and non-member countries, or among member countries.<sup>8</sup> One of the limitations in most previous CGE studies, however, is the neglect of foreign direct investment (FDI) in their analytical framework.<sup>9</sup>

Given the important role played by FDI around the world, particularly in the Chinese

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<sup>8</sup> See Liu (2007, 2008) and Kim (2007) for recent evidence about the effect of RTA on trade and international capital movements.

<sup>9</sup> One exception is Maldonado *et al.* (2007). They develop a CGE model for Brazil in which endogenous foreign capital flows are incorporated and find that the inclusion of endogenous foreign capital flows in the model significantly amplifies the real effects of free trade agreements between Brazil and the Americas or the European Union.

economy, the present paper uses an empirical model that is an extension of the Global Trade Analysis Project model (GTAP)<sup>10</sup> with FDI, known as FTAP. The treatment of FDI in FTAP closely follows the pioneering work of Petri (1997). The FTAP model also considers increasing returns to scale and monopolistic competition in all sectors. Its model structure in this respect is similar to the treatment of Francois *et al.* (1996) for manufacturing sectors, and that of Brown *et al.* (1996) and de Bruijn *et al.* (2008) for the services industry. FTAP makes a provision for capital accumulation and international borrowing and lending, adopting a treatment of international (portfolio) capital mobility developed by McDougall (1993) and incorporated into GTAP by Verikios and Hanslow (1999).<sup>11</sup>

The FTAP model takes the standard GTAP framework as a description of the location of economic activity and then disaggregates this activity by ownership. On the purchasing side, agents in each economy make choices among the products or services of each firm type, distinguished by both ownership and location, and then decide among the individual firms of a given type. Therefore, the model recognizes the firm-level product differentiation associated with monopolistic competition. Firms choose among primary inputs, intermediate inputs and investment goods, whereas households and governments choose among final goods and services.

In the FTAP model the supply of FDI is determined by an imperfect transformation among types of wealth. Investors in each economy first divide their wealth among bonds, real physical capital, land and natural resources in their country of residence. It is assumed that perfect international arbitrage in bond markets makes bonds issued by different countries perfect substitutes, whereas capital in different locations is assumed to be differentiated assets. After the portfolio decision, investors next choose the industry sector in which they invest and then choose whether to invest at home or overseas in their chosen sector. Finally, if they choose to invest overseas, then they decide on a particular overseas region in which to invest.

One of the advantages of the FTAP model is its capability to deal with the issues related to liberalization in the trade of services. Traditional analysis of trade barriers has focused primarily on the effects of tariffs, which are discriminatory taxes levied on foreign-produced goods at a country's border. In contrast, barriers to trade in services are typically regulatory barriers, rather than explicit taxes. They need not discriminate against foreigners. Indeed, barriers to market access are often designed to protect incumbent firms from any new entry by either domestic or foreign firms. One particularly important barrier to the trade of services is restrictions on FDI by service firms. These restrictions are captured in the

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<sup>10</sup> See Hertel (1997).

<sup>11</sup> See Verikios and Hanslow (1999) for a detailed illustration of the model structure of FTAP.

FTAP model as tax equivalents imposed on foreign firms in the host countries.

The version of the FTAP model used in this paper is developed by Dee (2007). The database GTAP 6 and some estimates relating to the trade barriers in services around the world are adopted.<sup>12</sup> The present paper updates the cross-Strait trade structure and tariff barriers in the FTAP model according to database GTAP 7 released in 2008. In addition, the tariff commitments made by Taiwan and Chinese Mainland when they entered the WTO in 2001 are also taken into account in the model. The data on these commitments are compiled from Chou *et al.* (2003).

## IV. Simulation Design and Empirical Results

### 1. Simulation Design

In this paper we are interested in examining the impact of cross-Strait trade liberalization under two scenarios: (i) a THKFTA prior to formation of ECFA; and (ii) a CSFTA after THKFTA. To take into account the recent cross-Strait trade liberalization policies (i.e. the CEPA and the three direct links between Taiwan and Chinese Mainland), we first simulate the impact of these two policies using the model along with the database. The trade barriers in commodity and services between Hong Kong and Chinese Mainland are assumed to be totally abolished as a result of the CEPA.

The shock parameters relating to the cost savings from the three direct links are based on the estimates of Dee (2007). Regarding the maritime services, it is assumed that Taiwan will open up the direct Taiwan–Shanghai route and treat it as a domestic route. Following McGuire *et al.* (2000), Dee (2007) first converts the regulatory restrictions of current maritime services in Taiwan into a quantitative index, and then applies the estimates of Kang (2000) to calculate how much impact the direct Taiwan–Shanghai route will have on the costs of maritime services. Dee finds that the cost savings from the direct route are 2.66 percent of the transportation costs.

Dee (2007) suggests that increased direct air transport services will lead to cost savings equivalent to the likely price difference between a direct air route, and an indirect route via Hong Kong. Based on the estimates of the relationship between stage length and airfare by Gonenc and Nicoletti (2000), Dee (2007) predicts the fare for a direct flight from Taipei to Beijing and compares it with actual fares from Taipei to Hong Kong, and from Hong Kong to Beijing. She finds that the opening of direct flights would be equivalent to a productivity improvement in air transport of approximately 75 percent.

The updated database derived from these simulations is then treated as our baseline

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<sup>12</sup> See Dee (2005) and Table 1.

situation. Our simulation analysis proceeds as follows. The first scenario assumes that the trade barriers in both commodities as well as services between Taiwan and Hong Kong are abolished immediately after the formation of THKFTA, except for the rice sector, which is too sensitive to be liberalized. The changes from our first scenario with respect to the baseline solution are used as a measure of the impact of THKFTA.

In the second scenario, in order to take into account Taiwan's remaining restrictive measures on imports from China so as to make the data on trade barriers in our database more realistic, we estimate tariff equivalents of these measures and then update the database derived from the first scenario. The estimation procedure of the tariff equivalents is as follows. Because export similarity between Chinese Mainland and ASEAN countries is very high, we assume that Taiwan's removal of the restrictive measures on China will cause cheaper Chinese products to replace like products from ASEAN countries. Shih *et al.* (2009) compare relative prices between China and four ASEAN countries (the Philippines, Malaysia, Indonesia and Thailand) to determine possible changes in the trade flows after the removal of restrictions. Based on these estimates, we apply the FTAP model to calculate how much tariff reduction would be required to produce such changes. The estimated required tariff reductions are then used as tariff equivalents of the restrictive measures (see Table 7).

After incorporating the estimated tariff equivalents into the database derived from the first scenario, we run the FTAP model to update the database and the updated database is then treated as our new benchmark. The trade barriers in both commodities as well as services between Taiwan and Chinese Mainland are assumed to be abolished immediately after the formation of CSFTA, except for the rice sector, which is considered too sensitive to be liberalized. The changes from our second scenario with respect to the new benchmark are used as a measure the impact of CSFTA.

## 2. Simulation Results

### (1) Exports

Tables 2 and 3 list the effects of cross-Strait trade liberalization on the volume and prices of exports, respectively, for all regions. It is clear that Taiwan will not gain much in terms of exports from a Taiwan–Hong Kong FTA, whereas it will see considerable increases in exports as a result of the formation of a CSFTA. This might be attributed to the fact that Hong Kong is a tariff-free economy, such that Taiwan cannot gain from any further tariff reductions when establishing a THKFTA. In contrast, because high tariff rates remain in some manufacturing industries of Chinese Mainland, Taiwan could benefit significantly from tariff reductions following on from the formation of a CSFTA. As shown in the tables, after the formation of the CSFTA, Taiwan's exports will increase by 8.45 percent and its



**Table 2. Effect of Cross-Strait Trade Liberalization on the Volume of Exports by Region**

Region \ Scenario	THKFTA			CSFTA		
	Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan	0.1248	-0.7876	-0.6638	8.3590	0.0874	8.4485
USA	-0.0007	0.0112	0.0105	0.0284	-0.0040	0.0244
Chinese Mainland	-0.0011	-0.1051	-0.1064	3.5594	-0.0194	3.5317
Hong Kong	0.1039	0.5009	0.6059	-0.0838	-0.0002	-0.0824
Japan	-0.0014	-0.0556	-0.0571	-0.0095	-0.0549	-0.0649
South Korea and ASEAN	0.0002	0.0462	0.0464	-0.1222	0.0215	-0.1003
Others	-0.0004	0.0211	0.0207	-0.0031	0.0076	0.0046

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

**Table 3. Effect of Cross-Strait Trade Liberalization on Export Prices by Region**

Region \ Scenario	THKFTA			CSFTA		
	Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan	-0.0132	0.0921	0.0789	1.6461	-0.0246	1.6252
USA	-0.0001	-0.0294	-0.0295	-0.0312	-0.0127	-0.0440
Chinese Mainland	0.0000	-0.0013	-0.0013	-0.2603	0.0019	-0.2575
Hong Kong	0.0224	-0.0504	-0.0277	-0.0545	-0.0076	-0.0623
Japan	-0.0004	-0.0023	-0.0027	-0.0211	-0.0025	-0.0235
South Korea and ASEAN	-0.0003	-0.0208	-0.0211	-0.0425	-0.0087	-0.0513
Others	0.0000	-0.0306	-0.0306	-0.0297	-0.0120	-0.0417

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

export prices will rise by 1.625 percent. Those gains mainly come from liberalization in commodity trade, whereas liberalization in the services trade does not have much impact on either the volume or the price of its exports.

As for Hong Kong, it will see small gains in its volume of exports from the formation of a THKFTA. Most of these gains can be attributed to liberalization in the services trade. The changes in the export prices of Hong Kong are negligibly small under all scenarios. These results might arise from the fact that the manufacturing sector accounts for only a very small part of the Hong Kong economy. In contrast, the volume of exports from Chinese Mainland will increase by 3.53 percent with a CSFTA. This rise is generated exclusively by liberalization

in the commodity trade. China will also see a small decline in export prices with a CSFTA, which results from liberalization in commodity trade. One possible reason for the fall in China's export prices could be the cheaper imported intermediate products after the abolition of its import tariffs, which might cause the costs of its processed exports to decline.

## (2) Imports

Tables 4 and 5 reveal the effects of cross-Strait trade liberalization on the volume and prices of imports, respectively, for all regions. The results are similar to the effects on exports. It is clear that Taiwan will not see large increases in imports with a Taiwan–Hong Kong FTA either, whereas it will experience considerable increases in imports with the formation of a CSFTA. After the formation of a CSFTA, Taiwan's imports will increase by 11.95 percent (which is far larger than the impact on its exports), while its import price will decrease

**Table 4. Effect of Cross-Strait Trade Liberalization on the Volume of Imports by Region**

Region	Scenario	THKFTA			CSFTA		
		Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan		0.1395	0.2226	0.3611	11.8097	0.1349	11.9512
USA		-0.0005	-0.0432	-0.0437	-0.0147	-0.0307	-0.0455
Chinese Mainland		-0.0025	-0.1984	-0.2011	4.4661	0.1474	4.6028
Hong Kong		0.1023	0.5150	0.6184	-0.3580	0.0011	-0.3591
Japan		-0.0013	0.1013	0.1000	0.0509	0.0092	0.0603
South Korea and ASEAN		0.0003	-0.0179	-0.0176	-0.2193	-0.0064	-0.2258
Others		-0.0004	0.0017	0.0013	-0.0113	-0.0017	-0.0129

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

**Table 5. Effect of Cross-Strait Trade Liberalization on Import Prices by Region**

Region	Scenario	THKFTA			CSFTA		
		Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan		0.0002	-0.0187	-0.0183	-0.0413	-0.0218	-0.0620
USA		0.0001	-0.0224	-0.0224	-0.0266	-0.0066	-0.0333
Chinese Mainland		0.0003	0.0278	0.0282	0.2653	-0.0221	0.2463
Hong Kong		-0.0009	-0.0117	-0.0126	0.0104	-0.0018	0.0086
Japan		-0.0001	-0.0255	-0.0256	-0.0288	-0.0030	-0.0318
South Korea and ASEAN		-0.0004	-0.0165	-0.0169	0.0024	-0.0071	-0.0048
Others		0.0000	-0.0294	-0.0294	-0.0314	-0.0117	-0.0431

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

by 0.06 percent. The increases in the volume of imports are mainly a consequence of liberalization of commodity trade. Similar to the effect on its exports, the effect on the volume of imports in Hong Kong under a THKFTA is small, and the increase in imports mostly originates from trade liberalization of services. In contrast, the volume of Chinese Mainland's imports will increase by 4.60 percent with a CSFTA, which is a little larger than the impact on its exports. The increases in the volume of imports mostly come from liberalization of commodity trade. Compared with the impacts on exports, the larger impacts on both the imports of Taiwan and Chinese Mainland indicate that Taiwan's three direct links and abolition of restrictive measures on its imports from Chinese Mainland might bring about closer and larger cross-strait production networks, which could contribute to better allocation of resources and higher competitiveness in this area.

### (3) Domestic Investment

Table 6 illustrates the effect of cross-Strait trade liberalization on domestic investment in this region. It reveals that the formation of a THKFTA will have a positive impact on domestic investment in both Taiwan and Hong Kong under the scenario of liberalization of services trade. Their gross domestic investment will increase by 2.90 and 1.19 percent, respectively. However, the liberalization of commodity trade will have a negligible impact on Taiwan's and Hong Kong's investment. A CSFTA will result in a similar impact on Taiwan's domestic investment. Its gross domestic investment will increase by 2.93 percent in this case, mainly resulting from the liberalization of commodity trade. After the formation of a CSFTA, however, Chinese Mainland's domestic investment will rise by only 0.28 percent. The significantly larger effects of a CSFTA on Taiwan relative to China might be attributed to the disparity in their sizes. It is worth noting that, similar to the case of external trade, the formation of a CSFTA will have a negligible small negative impact on Hong Kong's domestic investment under the scenario of trade liberalization of either commodities or services.

**Table 6. Effect of Cross-Strait Trade Liberalization on Domestic Investment**

Scenario		THKFTA			CSFTA		
		Commodity trade (1) (US\$m)	Services trade (2) (US\$m)	Total (1) + (2) (US\$m)	Commodity trade (3) (US\$m)	Services trade (4) (US\$m)	Total (3) + (4) (US\$m)
Taiwan	Gross investment (%)	-2 (-0.003)	1476 (2.90)	1475 (2.90)	1523 (2.90)	16 (0.03)	1539 (2.93)
Chinese Mainland	Gross investment (%)	0 (0.000)	-36 (-0.01)	-36 (-0.01)	417 (0.11)	688 (0.18)	1,104 (0.28)
Hong Kong	Gross investment (%)	4 (0.009)	531 (1.19)	535 (1.20)	-34 (-0.08)	-4 (-0.01)	-39 (-0.09)

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

*(4) Real GDP*

Table 7 reveals the effects of cross-Strait trade liberalization on real GDP in all regions. It is clear that the formation of a THKFTA will have a positive and significant impact on the real GDP of Taiwan and Hong Kong. Their real GDP will increase by 0.572 and 0.698 percent, respectively, which will mostly be induced by liberalization of the services trade. The formation of a CSFTA will contribute an additional 0.611 percent to Taiwan's real GDP, which exclusively arises from trade liberalization in commodities. A CSFTA will cause the real GDP of Hong Kong to decline, although only slightly (approximately -0.011 percent). The real GDP of Chinese Mainland is expected to increase by 0.125 percent with the formation of a CSFTA. Approximately three-quarters of the increases are attributable to liberalization of the services trade. These results suggest that Hong Kong and Chinese Mainland would enjoy much more in gains from trade liberalization of services than from trade liberalization of commodities.

*(5) Terms of Trade*

Table 8 shows the effects of cross-Strait trade liberalization on terms of trade in all regions. The terms of trade is the ratio of export price to import price. Changes in the terms of trade can be tracked from Tables 3 and 5, which report export prices and imports prices in all regions under different scenarios. It is worth noting that under trade liberalization of commodities with a THKFTA, Taiwan's terms of trade would fall because it could not gain from further tariff reductions by Hong Kong. Taiwan's gains in the terms of trade with a THFTA come mainly from trade liberalization of services. In contrast, the terms of trade for Hong Kong with a THKFTA will decrease by 0.015 percent, which is due to the greater losses in the terms of trade under liberalization of services trade than the gains from trade

**Table 7. Effect of Cross-Strait Trade Liberalization  
on Real GDP by Region**

Region	Scenario	THKFTA			CSFTA		
		Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan		-0.0006	0.5727	0.5721	0.6166	-0.0077	0.6116
USA		0.0000	-0.0009	-0.0009	-0.0004	-0.0005	-0.0009
Chinese Mainland		0.0002	0.0005	0.0007	0.0335	0.0913	0.1246
Hong Kong		0.0006	0.6971	0.6976	-0.0086	-0.0018	-0.0108
Japan		0.0000	0.0002	0.0002	-0.0007	-0.0004	-0.0012
South Korea and ASEAN		0.0000	-0.0054	-0.0054	-0.0125	-0.0037	-0.0162
Others		0.0000	-0.0015	-0.0015	-0.0004	-0.0013	-0.0017

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

**Table 8. Effect of Cross-Strait Trade Liberalization  
on Terms of Trade by Region**

Region	Scenario	THKFTA			CSFTA		
		Commodity trade (1) (%)	Services trade (2) (%)	Total (1) + (2) (%)	Commodity trade (3) (%)	Services trade (4) (%)	Total (3) + (4) (%)
Taiwan		-0.0133	0.1107	0.0972	1.6881	-0.0028	1.6883
USA		-0.0002	-0.0069	-0.0071	-0.0046	-0.0061	-0.0107
Chinese Mainland		-0.0003	-0.0291	-0.0295	-0.5242	0.0240	-0.5025
Hong Kong		0.0233	-0.0387	-0.0152	-0.0650	-0.0058	-0.0710
Japan		-0.0003	0.0232	0.0229	0.0077	0.0005	0.0082
South Korea and ASEAN		0.0001	-0.0043	-0.0043	-0.0449	-0.0016	-0.0465
Others		0.0000	-0.0012	-0.0012	0.0017	-0.0003	0.0014

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

liberalization in commodities.

Taiwan's terms of trade with a CSFTA will increase by 1.688 percent, which exclusively arises from trade liberalization of commodities. In contrast, China's terms of trade with a CSFTA will decrease by 0.503 percent, which also exclusively arises from trade liberalization in commodities. Because the changes in the terms of trade originating from trade liberalization in services are rather limited, the total changes in the terms of trade with a CSFTA can be attributed to higher pre-CSFTA tariff rates in China than those in Taiwan. Hence, Taiwan could gain from the mutual abolition of tariffs on both sides.

#### (6) Social Welfare

Table 9 illustrates the effects of cross-Strait trade liberalization on social welfare (in terms of equivalent variation) in all regions. The formation of a THKFTA will bring about significant increases in social welfare in both Hong Kong and Taiwan. Social welfare will rise by US\$1807m and US\$1065m, respectively. Their gains in social welfare mainly result from trade liberalization of services. In contrast, Taiwan's social welfare will increase by an additional US\$3551m after the formation of a CSFTA, which is mostly the result of trade liberalization of commodities. As for China, the formation of a CSFTA will yield a small net loss in its social welfare, because the increase in its social welfare from trade liberalization in services is dominated by the decrease as a result of trade liberalization of commodities. The negative impact of trade liberalization of commodities on social welfare in China is a result of the deterioration of China's terms of trade, as shown in Table 8. However, these results should be interpreted with some caution. Because it is assumed that only three sectors are considered in the trade liberalization of services due to data availability, the positive impact from the trade liberalization of services might be seriously underestimated.

Our simulation results further indicate that, along with the decreases in real GDP and terms of trade by 0.103 and 0.071 percent, respectively, a CSFTA will also cause Hong Kong's

**Table 9. Effect of Cross-Strait Trade Liberalization on Social Welfare by Region**

Region	Scenario	THKFTA			CSFTA		
		Commodity trade (1) (US\$m)	Services trade (2) (US\$m)	Total (1) + (2) (US\$m)	Commodity trade (3) (US\$m)	Services trade (4) (US\$m)	Total (3) + (4) (US\$m)
Taiwan		-18.3	1825.7	1807.2	3527.9	12.2	3551.2
USA		-1.4	-218.1	-219.4	-171.6	-140.8	-314.3
Chinese Mainland		0.0	-241.6	-241.7	-1,006.2	999.9	-6.1
Hong Kong		21.3	1043.6	1065.1	-472.2	3.8	-475.1
Japan		-0.9	843.7	842.6	235.0	355.9	594.5
South Korea and ASEAN		-0.1	-409.2	-409.3	-443.2	-183.5	-629.6
Others		-1.9	-573.9	-575.9	-155.4	-300.5	-458.0

**Source:** Compiled by the authors.

**Notes:** Individual entries might not add to total because of interaction effects. CSFTA, cross-Strait free trade area; THKFTA, free trade arrangement between Taiwan and Hong Kong.

social welfare to decline by US\$475.1m. These negative impacts are mainly attributable to liberalization of commodity trade. These results suggest that the harmful effects on Hong Kong from trade liberalization between Taiwan and Chinese Mainland appear to be small. One possible reason for this is that in this paper we assume that Hong Kong has a free trade arrangement with Taiwan before China so that Hong Kong will not be placed at a disadvantaged position after a CSFTA takes effect. Another possible reason is that the impact of the three direct links between Taiwan and Chinese Mainland is already considered in our benchmark model and, hence, its negative impact will not appear in the second scenario.

It is interesting to note that Japan, in contrast to other non-member countries, might have some gains in its social welfare from the cross-Strait trade liberalization under certain scenarios. This might be attributed to the fact that Japan has many multinational firms located in East Asia in general, and China and Hong Kong in particular. These firms might benefit from economic growth in the area after cross-Strait trade liberalization.

## V. Conclusion

Closer informal economic integration across the Taiwan Strait has been advancing steadily since the late 1980s despite political animosity on both sides of the Strait. However, cross-Strait political and economic relationships have developed rapidly since Taiwan's new government adopted a new policy toward Chinese Mainland after its presidential inauguration in 2008. This change is expected to result in tremendous impacts on the economies in this area. To evaluate who will benefit and who will suffer from this development, this paper has applied a multi-regional CGE model to investigate the economic effects of trade liberalization across the Taiwan Strait.

We first consider the effects of a free trade arrangement between Taiwan and Hong Kong and then examine the effects of extending the Taiwan-Hong Kong free trade

arrangement to include Chinese Mainland. Our simulation results reveal that cross-Strait trade liberalization will have significant positive impacts on external trade, domestic investment and real GDP of the economies in this area in general, and on Taiwan's economy in particular. Furthermore, the negative impact of the formation of a free trade arrangement between Taiwan and Chinese Mainland on Hong Kong's economy seems to be rather small. These results suggest that cross-Strait trade liberalization is very likely to bring about a win-win situation for the economies in this area.

There are some limitations in the present study, so the empirical results should be interpreted with some caution. First, it is found in this paper that most benefits from trade liberalization for Hong Kong and Chinese Mainland are attributable to liberalization of the services trade. However, due to data availability, this paper only considers the impacts of three sectors in the case of trade liberalization of services. Second, other institutional changes following a free trade arrangement, such as trade and investment facilitation, are not incorporated into the model. Given the declining tariff barriers in most countries around the world, trade and investment facilitation measures might result in much larger benefits to member countries than tariff reductions. Third, in addition to international capital, a free trade agreement between Taiwan and Chinese Mainland could create a more attractive environment for domestic investment, particularly for Taiwan. This channel and its impact have yet to be incorporated into our analytical framework. Therefore, the benefits of cross-Strait trade liberalization illustrated in the present study might represent conservative estimates of the potential impact.

However, there are some possible obstacles ahead in terms of the implementation of cross-Strait trade liberalization. For instance, because many people in comparatively disadvantageous industries might be hurt to some extent by trade liberalization of goods or services, opposing political momentum arising from lobbying activity by negatively impacted sectors has been increasing recently in Taiwan. In addition, potential political costs associated with cross-Strait trade liberalization are not considered in this paper. This is one of the most important concerns of the opposing parties in Taiwan. The sovereignty disputes might become a critical issue in the signing of a free trade agreement between Taiwan and Chinese Mainland. It hinges on the wisdom of the leaders on both sides of the Strait to cope with these political obstacles.

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