Trade and Direct Investment Trends across the Taiwan Strait - An Empirical Analysis of Taiwan and China's Accession into the WTO

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ABSTRACT

The purpose of this paper is twofold. We begin by applying a multi-regional computable general equilibrium model to analyze the impacts of the global liberalization of trade in both services and commodities following the accession of Taiwan and China into the WTO. Thereafter, we investigate the differences resulting from changes in Taiwan's trade and investment policies towards mainland China. The distinctive feature of this study is that the effect of accession on foreign direct investment into mainland China is incorporated into the empirical model

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INTRODUCTION

On 10 November 2001, at a meeting of the World Trade Organization (WTO) in Doha, Qatar, WTO trade ministers unanimously approved the admission of both mainland China and Taiwan, two major global trading economies, into the global trading body.[1] The accession of these two economies into the WTO will undoubtedly strengthen the global trading system and expand worldwide economic growth; nevertheless, it will require them to follow the same trading rules as other WTO members, whilst also introducing them to greater competition.

China was officially welcomed into the organization on 11 December 2001, after which, its average tariff level was reduced to 15 per cent for agricultural products, whilst for industrial goods the average tariff level went down to 8.9 per cent. China also agreed to limit its subsidies for agricultural production to 8.5 per cent of the value of farm output (below the 10 per cent level allowed for developing countries under WTO regulations). In addition, foreign telecommunications service suppliers would be permitted to establish joint venture enterprises and to provide services in several cities; however, the share of such joint ventures is initially not to exceed 25 per cent. Within five years of accession, the foreign-owned share of investment would be raised to 49 per cent with all geographical restrictions being removed. Foreign financial institutions would be permitted to provide services within China with no client restrictions in foreign currency business. Within two years of accession, foreign financial institutions would also be permitted to provide services to Chinese enterprises for local currency business; this would be extended to all Chinese clients within five years of accession.

Taiwan subsequently became a member of the WTO on 1 January 2002. As part of its WTO accession commitments, between 2003 and 2011, Taiwan's average tariffs on agricultural products are to be reduced to 12.89 per cent, whilst average tariffs on industrial products are to be adjusted downward to 4.15 per cent by 2011. All of the existing controls and area restrictions on imports have been replaced by tariff quotas or free imports, with the exception of volume restrictions on the importation of rice.

Within the services sector, the gradual opening up of the services market for lawyers, accountants and other professional services had already been achieved prior to WTO

[1] In 2000, Taiwanese and Chinese imports amounted to US$140 billion and US$225 billion, accounted respectively for 2.12 per cent and 3.41 per cent of total world imports. In terms of the global share of imports, these figures saw China ranking seventh, and Taiwan fourteenth.

accession, along with the opening up of finance, insurance, securities futures, telecommunications, transportation, education and movie businesses. In addition, there will be further opening up of the domestic market to the establishment of foreign mutual insurance company branches and to foreign legal practices. Ratio restrictions on foreign investment in the air freight forwarding business and air cargo hubs will be totally eliminated, as will the ratio requirements for the screening of domestically- produced movies. The domestic imposition of 'movie assistance fees' on foreign movies will also be scrapped.

Following the accession of Taiwan and China into the WTO, a current issue of controversy is how Taiwan is to adjust its policies with regard to trade and direct investment across the Taiwan Strait. Although these activities have long been regulated by the Taiwanese government for political reasons, over the past two decades, Taiwan has nevertheless become one of the most important exporting countries to mainland China, as well as a source country for foreign direct investment (FDI).[2] This gives rise to interesting questions such as: How have these policies affected trade and investment activities across the Taiwan Strait? And what will be the effect of Taiwan's freer trade and direct investment polices on economic relations between Taiwan and China?

This study has a two-fold purpose. We begin by applying a multi-regional computable general equilibrium model to analyze the impacts of the global liberalization of trade in both services and commodities following the accession of Taiwan and mainland China into the WTO. Thereafter, we investigate the differences resulting from changes in Taiwan's trade and investment policies towards China. In contrast to previous studies, the distinctive feature of this study is that the effects of accession on FDI into mainland China are incorporated into the empirical model

The remainder of this paper is organized as follows. Recent trends in trade and investment across the Taiwan Strait are analyzed in the next section, followed in the subsequent section by presentation of the structure of the GTAP model and the extension of the model. The penultimate section provides a discussion on the simulation design and simulation results. Brief concluding remarks are provided in the final section.

[2] See the subsequent section for details.

RECENT TRADE AND INVESTMENT TRENDS ACROSS THE TAIWAN STRAIT

Taiwan, which is divided from mainland China by the Taiwan Strait, continues to be closed to China. Although the geographical distance between the two sides of the Strait is less than 100 miles, there was almost no economic interaction across the Strait until China embarked upon its economic reforms in 1979. Despite such developments, tension continues to exist between the economies of the two sides of the Strait. China still regards Taiwan as a renegade province and refuses to renounce the use of force as a means of solving the Taiwan Strait issue under its own 'One China' principle.[3]

The Taiwanese government has taken very cautious steps towards normalizing its economic relationship with China, with cross-strait trade being limited to indirect trade only. However, regulations governing the indirect export of ROC goods to mainland China are identical to those governing exports to other countries and regions. Imports into Taiwan from mainland China are permitted, providing they do not run contrary to any national security interests and that they do not have any adverse effects on related industries.[4] Recent cross-strait trade statistics are shown in Table 1.

Table 1 Cross-strait trade statistics

Unit: US$ million

Year	Taiwan				China			
	Exports to		Imports from		Exports to		Imports from	
	China	Hong Kong	China	Hong Kong	Taiwan	Hong Kong	Taiwan	Hong Kong
1995	335	26,106	3,108	1,843	3,098	35,983	14,784	8,591
1997	628	28,688	3,915	1,996	3,397	43,797	16,434	6,997
2000	4,222	31,336	6,223	2,187	5,040	44,530	25,497	9,431
2001	4,746	26,961	5,902	1,849	5,006	46,503	27,344	9,424

Sources: Data on Taiwanese imports from *Monthly Statistics of Exports and Imports*, Department of Statistics, Ministry of Finance, ROC; Chinese export data from the World Trade Atlas based on China's Customs.

Despite having been mired in recession in 2001, Taiwan's exports to mainland China have grown steadily over time; however, the official export statistics, which show a recorded level of US$4,746 million in 2001, are much lower than the official figures for China's imports from Taiwan, at US$27,344 million. This is because a large proportion of Taiwanese goods exported to China are shipped via a third port or region, such as Hong Kong or Okinawa. As Table 1 shows, however, the sum total of Taiwan's direct

[3] Lee Teng-hui (1999), 'Understanding Taiwan', *Foreign Affairs*, November/December, pp. 9-14.

[4] BOFT (2002), 'Trade Policies and Measures', Board of Foreign Trade, Ministry of Economic Affairs, ROC, http://www.moeaboft.gov.tw/english/Trade%20Issues.htm

exports to China, plus its total exports to Hong Kong, actually exceed China's total recorded imports. This is easily explained, since Taiwan's exports to Hong Kong are not only for re-export to China, but also include re-exports to other regions, and direct exports *per se* to Hong Kong.

Many alternative measures, including GTAP, have been adopted in an attempt to make up for the statistical discrepancy between Taiwan's exports to mainland China, and China's imports from Taiwan, with GTAP time series trade data on re-exports, under-reported intra-regional trade and non-reporting having largely accounted for this difference. Table 2 provides details of the GTAP export matrix on Taiwan, Hong Kong and mainland China. [5]

Table 2 GTAP export matrix, 1997

Unit: US$ million

Source	Destination		
	Taiwan	China	Hong Kong
Taiwan	-	25,707	5,155
China	5,152	2	12,131
Hong Kong	961	8,033	-

Source: GTAP, version 5.

With the exception of the period of recession in 2001, imports into Taiwan have also grown steadily. In fact, the difference between Taiwan's recorded imports from mainland China, and China's recorded exports to Taiwan, is relatively small, and these two figures are smaller than Taiwan's exports to China or China's imports from Taiwan. On the whole, Taiwan has enjoyed a cross-strait trade surplus, partly as a result of the indirect trade scheme which restricts Chinese goods into Taiwan, but of greater significance is the technological gap existing between the two economies, with Taiwan having a comparative advantage in those products which have high value-added and which are capital- and technology-intensive.

On the other hand, Taiwan has injected an investment sum in excess of US$19 billion into mainland China, helping to boost China's exports to the rest of the world, and indeed, inducing greater exports from Taiwan to China (see Table 3). However, in order to determine the amount of investment into mainland China, it is also necessary to adopt indirect measures,

[5] Other estimates of Taiwan's exports to China in 1997 are US$20,518 million (by the Board of Foreign Trade, Ministry of Economic Affairs, ROC) and US$22,460 million (by the Council for Mainland Affairs, ROC); both of these figures are lower than the GTAP estimate.

because, where the investment amount is over US$1 million, Taiwanese investors are required to set up their offices in a third place prior to launching their Chinese investment.

Table 3 Taiwan's outward investment into mainland China

Year	Taiwanese-approved Investment into Mainland China				Mainland China's Recorded Inward Investment from Taiwan		
	Original Registration (US$ million)	Made up Registration (US$ million)	Total Registration (US$ million)	Proportion of Outward Investment (%)	Contracted Amount (US$ million)	Amount Actually Invested (US$ million)	Proportion of Inward Investment (%)
1991-01	14,623	5,263	19,886	41.29	55,363	28,922	7.71
1991-95	3,616	2,028	5,644	44.02	30,110	11,208	9.75
1996-00	8,223	3,235	11,458	40.69	18,353	14,574	6.83
1996-01	11,007	3,235	14,242	40.31	25,253	17,714	6.80
1991	174	-	174	9.51	3,430	466	10.68
1992	247	-	247	21.78	5,543	1,050	9.33
1993	1,140	2,028	3,168	65.60	9,965	3,139	11.30
1994	962	-	962	37.30	5,395	3,391	9.99
1995	1,093	-	1,093	44.62	5,777	3,162	8.42
1996	1,229	-	1,229	36.20	5,141	3,475	8.32
1997	1,615	2,720	4,335	59.97	2,814	3,289	7.27
1998	1,519	515	2,034	38.15	2,982	2,915	6.41
1999	1,253	-	1,253	27.71	3,374	2,599	6.45
2000	2,607	-	2,607	33.93	4,042	2,296	5.64
2001	2,784	-	2,784	38.80	6,900	3,140	6.70

Sources: Investment Commission, *Statistics on Overseas Chinese & Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment and Guide to Mainland Industry Technology*, (December 2001), Ministry of Economic Affairs, ROC; China Statistical Yearbook (2001), China Statistics Press; Industrial and Investment Development Center, Situation of Taiwanese Investment in Mainland, Ministry of Economic Affairs, ROC, http://www.idic.gov.tw/html/c3409.html

As Table 3 shows, Taiwan's approved statistics show a total amount of US$19,886 million for the period 1991 to 2001, whereas the figure recorded by China on Taiwanese investment which has actually taken place, is US$28,922 million. The discrepancy between these Taiwanese and Chinese statistics, which represents a gap of 45 per cent, indicates that a great deal of Taiwanese investment has taken place without registration. Indeed the government in Taiwan urged businessmen in 1993, and again in 1997-98, to register their investment after the event, allowing them an opportunity to make up for their earlier failure to register without penalty. Although this did succeed in removing around a quarter of the discrepancy, clearly a large gap still remains.

Despite this discrepancy, Taiwanese investment into China still accounts for 41.3 per cent of its overall outward investment, whereas it represents just 7.7 per cent of China's total inward investment. This significant amount of investment into China is the main reason that the Taiwanese government set up its indirect investment scheme, in

order to diversify the risks, but it is also self-fulfilling, since it represents a preference by Taiwanese businessmen to invest in China.

Factors such as low labor cost, market size and similarity in both language and cultural background, all attract Taiwanese businessmen to undertake investment in mainland China. The 'no haste, be patient' investment policy, which was announced in 1996, did succeed in slowing down Taiwanese investment in China, as shown in the official statistics of both sides. Taiwan's share of total FDI flowing into China was reduced from 9.73 per cent in 1991-1995 to 6.83 per cent in 1996-2000; whilst China's share of Taiwan's total outward investment was reduced from 44 per cent to 40.3 per cent over the same period.[6]

In this time of globalization, the global division of labor is a prerequisite in pursuing the achievement of the lowest possible costs during each stage of production; this therefore poses a significant dilemma for Taiwan. The current intention of the government in Taiwan is to keep mainland China at a distance, yet it becomes obvious that the mainland and Taiwan are mutually complementary in the global division of labor. The mainland has abundant land and sources of cheap labor, whilst Taiwan has a substantial amount of technology, management skills and global marketing experience, and it may well become a matter of judgment as to whether political or economic concerns should take precedence. Nevertheless, the fact remains that entanglement already exists, and the existing government restrictions are merely preventing manufacturers from taking full advantage of this division of labor.[7]

Following the demise of Taiwan's economy into its worst recession since the 1950s, the Economic Development Advisory Conference (EDAC) was called upon by the Taiwanese President to find a solution. The month-long conference yielded a total of 322 consensus decisions on taxation and finance reforms, including 36 aimed at developing closer economic ties with the mainland. The proposals included replacing the 'no haste, be patient' policy with a policy advocating 'active opening and effective management'; lifting the US$50 million cap on single investments in the mainland and the limit on total

[6] However, Taiwan's outward investment to the British Territories in Central America increased tremendously from 1996-2000, as did China's inward investment from this region, as shown in Appendix Tables 1 and 2. Although investors used these tax havens to escape tax, some Taiwanese investors may also make use of their offices in these places to pursue investment into mainland China in order to circumvent Taiwanese government regulations. Since there is no evidence to show that this pathway is used, we use the official statistics in our study with this phenomenon in mind.

[7] See Cho, H-W., 'Taiwan after WTO Accession', http://www.dsis.org.tw/peaceforum/papers/.

investments there by listed companies; allowing mainland tourists to visit Taiwan and mainlanders to invest in Taiwan's real estate and stock markets; and actively pursuing direct trade, transportation and postal links with the mainland.

The Taiwanese government had already decided to deepen the island's economic integration with the mainland, both in an effort to raise Taiwan's global competitiveness, and with pursuit of WTO accession in mind. On 7 November 2001, Taiwan scrapped its existing bans on direct trade and investment, although the government did announce its intention to continue screening any investments over US$20 million, along with all investments in the petrochemical and IT industries which are deemed as strategic to Taiwan's economy.

How will these policy changes affect its cross-strait economic relations as well as its relations with other economies? This is the empirical issue that we intend to examine in the following sections.

MODEL SPECIFICATION

The empirical model used in this paper is the GTAP model V.6 with the GTAP database V.5, which aggregates data into 12 regions and 25 sectors. Within each region, a household is assumed to distribute its expenditure across three different categories including private consumption expenditure, government expenditure and savings. The regional household is assumed to have a Cobb-Douglas Utility function. In the model, a CDE expenditure system is adopted for private household consumption. The government has a Cobb-Douglas utility function and firms adopt a Leontief-CES nest of production. Each agent in the economy acts in a way that will optimize its choices. In order to cope with the inconsistency of the constant shares of regional household budgets with the non-homothetic CDE expenditure function for private consumption, in the newest version of the model (V.6) the distribution parameters of the regional household Cobb-Douglas Utility function are treated as variables. Thus, for the regional household, the shares of private consumption expenditure, government expenditure and savings, can be varied in response to price and income changes. A detailed structural description of the model can be found in Hertel, *et. al*. (1997).[8]

[8] Modifications of the model for newer versions can be found in the GTAP homepage.

Closure Rules

As Francois, *et. al*. (1996) noted, the static approach fails to account for the positive relationship between trade, investment and growth. In a study such as ours, the attraction of foreign investment by China, through its accession into the WTO, is viewed as a crucial element. The static approach fails to take account of the linkage between investment and its effect on production capacity and growth, which is obviously a vital weakness. We therefore follow Francois, *et. al.* (1996) in an effort to cope with this problem, adopting a steady state approach and exploring the capital accumulation effects on China from WTO accession.

Within our simulations, we divide our analysis into two different types by adopting two different capital market closure rules. The first group of simulations uses a static closure; in this case, we fix the capital stock for each region. In these simulations, although WTO accession by both Taiwan and mainland China leads to varying levels of investment in each region, it does not affect the capital stock which they use for production. Thus, in this case, the change of investment has only demand side effects. In the second group of simulations, assuming a fixed savings rate, we allow the capital stock to vary in response to investment. In this case a steady state is achieved when savings cover depreciation. Thus, in cases where a shock causes a change in investment, this is followed by a change in capital stock, and the rate of change in capital stock is set at a level which is equal to the rate of change in investment.

Foreign Direct Investment

As mentioned above, FDI is a crucial element of China's WTO accession. In the case of FDI between Taiwan and mainland China, due to the current political impasse, this is an even more complicated issue. In our study, we assume that the accession of both Taiwan and China into the WTO frees up FDI across the Taiwan Strait, and will thus have crucial effects on the economies of both sides.

Our model adopts the setup of Weng, *et. al*. (2002) to provide specific treatment to FDI between Taiwan and China. Following Malcolm's (1998) treatment of country risks, Weng, *et. al.* (2002) used an investment-attractiveness coefficient to adjust a country's expected return of capital. Thus, in the model:

$$RORE(r) = RORG / INVATT(r)$$

where *RORE* is the expected return of capital in region *r*; *RORG* is the global capital return level; and *INVATT(r)* is the investment-attractiveness coefficient in region *r*.

As long as a country has greater investment attractiveness, it can continue to attract more foreign investment, even though its expected return on capital is the same as others. Within this setup, the WTO accession of China makes it more attractive to Taiwanese firms to invest in mainland China even though its expected return may be the same. The sources of this increase in attractiveness can be various. They can stem from the expectation of better relationships between the two sides of the Strait, or the enforcement of WTO rules applied to the two sides, thus making Taiwanese investment in China more secure, both economically and politically. The value of this investment- attractiveness coefficient is estimated and calibrated from a regression analysis as described below.

SIMULATION DESIGN

We carry out four simulations in this study. As in most of the studies on trade liberalization, we assume tariff and non-tariff barrier (NTB) cuts in all of the four simulations. The detailed description of these barrier cuts is provided in the following Data Description section. However, due to the special economic and political relations between Taiwan and China, and the importance of capital accumulation effects on these economies, we divide our simulations according to capital accumulation treatment and possible policy changes made by the Taiwanese government. Table 4 provides details of our simulation design.

We separate the simulations into two different types according to the capital accumulation closure rules. Scenarios A and B are static simulations in which capital accumulation effect is not considered. In scenario A, we assume that the Taiwanese government adopts a conservative stance on cross-strait relations so that it continues to follow the earlier ‘no haste, be patient’ policy. That is, direct shipments across the Taiwan Strait continue to be prohibited and direct investment activities continue to be highly regulated. In scenario B, we assume that the Taiwanese government adopts a more liberalized view so that it not only allows direct cross-strait shipments but also freer investment policies towards mainland China, a policy referred to as ‘active opening, effective management’.

Table 4 Simulation design

Simulation Specifications	Scenarios			
	Static		Steady-State	
	Scenario A	Scenario B	Scenario C	Scenario D
Post-Accession Trade Liberalization	Yes	Yes	Yes	Yes
Direct Cross-Strait Transportation	No	Yes	No	Yes
Cross-Strait Investment Liberalization	No	Yes	No	Yes

Notes:

[1] 'Post-Accession Trade Liberalization' refers to the reductions in barriers to trade in commodities and services after the accession of Taiwan and China into the WTO. The other regions in the world are assumed to have completed their commitments in the Uruguay Round trade negotiations.

[2] 'Direct Cross-Strait Transportation' refers to the lifting of transportation barriers imposed by the Taiwanese government. It is estimated that direct transportation will reduce transportation costs between Taiwan and mainland China by 40 per cent.

[3] 'Cross-Strait Investment Liberalization' refers to the lifting of regulations imposed by the Taiwanese government on direct investment activities in mainland China.

Data Description

GTAP database V.5 is basically constructed using 1997 data. However, in order to ensure that it provides a comparable baseline for our study, we attempt to adjust this database, bringing it is as close as possible to the real situation in 2001, when Taiwan and China gained WTO accession. Our simulations comprise of two stages. In the first stage, simulations are carried out to adjust the database. In the second stage, the updated database is then used to evaluate the effects of Taiwan and China's accession into the WTO.

Following Francois, *et. al.* (1995), we assume that under the Uruguay Round Agreement, the developed countries were required to reduce tariff rates within their industrial sectors by an average of 36 per cent, and for agricultural 'aggregate measurement of support (AMS) by 20 per cent over six years. For the developing countries, the reduction in industrial tariff rates is assumed as 24 per cent, and for agricultural AMS, 13.3 per cent, to be undertaken over a ten-year period. By 1997 (the year upon which the GTAP Database V.5 is based), both advanced and developing countries had already completed part of their commitments. Using the 1997 database, we thus conducted our first stage simulations by reducing the remaining two thirds of trade liberalization promises for the years 1997 to 2001 for advanced countries and two fifths for the developing countries.

For the service sectors, we first adopt Hoekman's (1995) method and results to calculate the tariff equivalent for various barriers within each sector, and then adjust the GTAP database, using Malcolm's (1998) procedure, to cope with these tariff changes. In the first stage simulation, service tariff equivalents are cut by 25% for both developed and developing countries. Using the results of the first stage as our new database, we then carried out the second stage simulations, within which, the advanced countries actually

have no cuts in trade barriers, and instead, the developing countries are required to undertake further liberalization for the remaining two fifths of their original commitments. A further 25% of tariff equivalents is assumed to be removed from the service sectors in the second stage simulation for all countries. The respective trade barrier reductions for the first and second stages are shown in Tables 5 and 6.

Table 5 Tariffs and/or Non-Tariffs Reductions: 1997-2001

	Developed Countries	Developing Countries
Agriculture	13.3%	5.3%
Industries	24%	9.6%
Services	25%	25%

Note: According to the Uruguay Round agreement, we assume that developed countries have to reduce 20% of the AMS in their agricultural sectors and 36% of the tariff rates in their manufacturing sectors. For the five years from 1997 to 2001, we thus assume that they cut the AMS in their agricultural sectors and tariff rates in their manufacturing sectors by 20% x (2/3) = 13.3%, and 36% x (2/3) = 24%, respectively. We assume that developing countries have to reduce their agricultural AMS by 13.3% and manufacturing tariff rates by 24% in ten years. Thus, for the five years from 1997 to 2001, the developing countries cut their agricultural AMS by 13.3% x (2/5) = 5.3%, and their manufacturing tariff rates by 24% x (2/5) = 9.6%.

As a result of the recent accession of Taiwan and China, their trade liberalization treatment is different. The degree of trade liberalization within the agricultural and manufacturing sectors in Taiwan is calculated based on the data provided by the Department of Customs Administration, Ministry of Finance, Taiwan. Table 6 shows the degree of trade liberalization in the agricultural and manufacturing sectors with details provided of the reduction in both tariffs and the tariff equivalents of non-tariff barriers. The degree of trade barriers for the services sectors is calculated using Hoekman's method, and details of the tariff equivalents for the services sectors are shown in Appendix Table A-3.

It has been estimated that direct cross-strait shipments will result in significant reductions in transportation costs, of around 40 per cent.[9] As for the impact of freer investment policies on direct investment by Taiwanese firms, numerous studies have contributed to the issue of China's FDI. Amongst these, Wang and Swain (1995) provided an econometric analysis of factors influencing foreign capital inflows into Hungary and China. Weng, *et. al*. (2002) applied the same method to estimate the attractiveness parameter for China's FDI, displaying some innovative thinking for incorporation with their CGE study.

[9] According to Weng, *et. al*. (2002), the average reduction in shipping costs is 39.3%.

However, both studies suffer problems of inconsistencies in some numerical results and a lack of degrees of freedom. (Liu, *et. al*., 1997: 314)

Table 6 Tariff and/or non-tariff reductions, 2002 and beyond

Unit: %

Sector	Taiwan	China	Developed Countries	Developing Countries
Agriculture	4.18	9.81	-	5.32
Livestock	2.62	0.91	-	5.32
Forestry	0.00	0.00	-	5.32
Fishing	13.75	22.31	-	5.32
Minerals	2.14	0.32	-	9.60
Food	6.08	20.03	-	9.60
Beverages	15.99	66.10	-	9.60
Textiles	6.26	40.76	-	9.60
Clothing	8.03	15.11	-	9.60
Petroleum	12.31	57.20	-	9.60
Chemical	25.90	48.03	-	9.60
Ferrous Products	63.31	2.21	-	9.60
Metal Products	20.09	25.55	-	9.60
Motor Vehicle	47.54	11.63	-	9.60
Other Transport Equipment	15.36	18.60	-	9.60
Electronic Equipment	23.89	11.27	-	9.60
Machinery Equipments	22.37	11.16	-	9.60
Other Manufacturing	41.61	28.64	-	9.60
Electricity	-	-	-	-
Construction	25.00	25.00	25.00	25.00
Trade	25.00	25.00	25.00	25.00
Transport	25.00	25.00	25.00	25.00
Communication	25.00	25.00	25.00	25.00
Financial Services	25.00	25.00	25.00	25.00
Other Services	25.00	25.00	25.00	25.00

Our study uses panel data analysis, as applied by Liu, *et. al*. (1997) and Dees (1998), with an emphasis on the effects of Taiwan's policy changes on FDI inflows into China. The panel data covers the period 1990-1999 and 27 home countries/regions. The variables of relative size of domestic market in terms of relative real GDP, relative real wage rates, tariff rates, and real imports from home regions, are chosen as possible determinants of China's FDI inflow. To account for the effects of Taiwan's 'no haste, be patient' investment policy, we add a dummy variable for Taiwan with a value of '1' after the year 1996, and '0' for the rest of the sample observations. An Asian financial crisis dummy (CRISIS) is also added to control for the effects of this major incident.

In order to choose an appropriate statistical model, we carry out a hypothesis test of

intercept homogeneity, with a resultant F-statistic of 8.9454, which is greater than the 5 per cent critical value of F(= 6.4578). This suggests that the intercepts are not homogeneous across different countries. In addition, since we attempt to predict individual behavior from the regression results, the fixed effects model, as opposed to the random effects model, seems to be more appropriate for our purposes.

Our fixed effect regression results indicate that market size and imports into China are positively related to the amount of foreign capital inflow, while relative wage rates and tariff rates are negatively related (see Table 7). In addition, Taiwan's 'no haste, be patient,' investment policy also affects the amount of FDI inflow into China. We find that Taiwan's application of this policy since 1996 has caused the amount of capital inflow into China to fall by 2.27 per cent. In scenarios B and D, we therefore assume that freer investment policies by Taiwan towards China will increase Taiwan's direct investment into China by 2.27 per cent.

Table 7 Estimate of elasticities of FDI inflows into China

Explanatory variables	Estimated Coefficient	t-statistic
Relative GDP size	-3.43	-4.30
Relative real wage rate	0.56	1.93
Relative Tariff rate	-0.70	-2.01
Exports to China	0.99	7.83
Taiwan's Dummy	-2.27	-2.78
Asian Crisis	-0.43	-1.78
R-squared	0.82	
Adjusted R-squared	0.79	

Note: Estimated results are calculated by the authors. The definition of variables are:

FDI = the annual inflow of foreign direct investment into China from 27 countries, ie. Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Indonesia, Italy, Japan, Korea, Macao, Malaysia, the Netherlands, New Zealand, Norway, the Philippines, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, the United Kingdom and the United States.

Relative GDP size = the ratio of real home country GDP to Real Chinese GDP.

Relative real wage rate = the ratio of real home country wage rates to Chinese wage rates. All wages are productivity-adjusted.

Relative Tariff rate = Chinese tariff rates applied to home countries.

Export to China = Home countries' exports to China (data from China's customs imports).

Taiwan's Dummy = a dummy variable for Taiwan with a value of '1' after the year 1996, and '0' for the rest of the sample observations, included to account for the effects of Taiwan's 'no haste, be patient' investment policy.

Asian Crisis = a dummy variable for Asian countries, and countries which involve heavily trade with Asian countries with a value of '1' after the year 1997, and '0' for the rest of the sample observations.

SIMULATION RESULTS

The Effects on Regional Economies

The static effects on regional economies from the accession of Taiwan and China are summarized in Table 8. The results of scenario A indicate that the real GDP of all regions increases as a result of their accession, ranging from 0.29 per cent for the 'Rest of World' to 0.05 per cent for the EU. The respective real GDP for Taiwan and China rises by 0.17 per cent and 0.15 per cent. After accession, the volume of exports and imports in all regions also increases, with the exception of exports from China, which fall by 0.36 per cent. Welfare, in terms of Hicksian equivalent variation (EV), goes up in all regions, with the exception of South Asia, where the EV decreases slightly, despite the increase in real GDP levels; this may be the result of the 1.02 per cent deterioration in their terms of trade. The trade balance in the developed countries, such as Japan, NAFTA and the EU, goes up, whilst that of China declines as a result of the large increase in imports and reduction in exports.

The scenario B results provided in Table 8 indicate that Taiwan's direct cross-strait shipments and investment liberalization policies have very little effect on the regional economies with the obvious exceptions of Taiwan and China themselves. In general, both economies benefit from such direct cross-strait shipments and investment liberalization policies. Taiwan's real GDP rises from 0.17 per cent to 0.21 per cent, whilst real GDP in China rises from 0.15 per cent to 0.17 per cent. In addition, the change in welfare of Taiwan also rises from US$524 million to US$1,942 million, whilst that of China goes from US$4,044 million to US$7,291 million. These figures suggest that with Taiwan's freer trade and investment policies, Taiwan and China can seize much larger gains from global trade liberalization.

The steady state effects on regional economies, from the accession of these two economies, are summarized in Table 9. A comparison of static and steady state results indicates that incorporating the dynamic effects of trade liberalization significantly changes the empirical results, not only in terms of their magnitude, but also their signs. We can attribute this to the fact that following accession, there is a decline in real investment in Japan, Australia and New Zealand, NAFTA and the EU, as Table 8 demonstrates, whilst real investment in other regions increases as a result of global trade liberalization.

Table 8 Changes in selected macroeconomic indicators, static results

Unit: %

Region	Scenario A							Scenario B						
	Real GDP	Real Investment	Real Export	Real Import	Trade Balance	Terms of Trade	Welfare	Real GDP	Real Investment	Real Export	Real Import	Trade Balance	Terms of Trade	Welfare
Taiwan	0.17	0.56	2.41	3.16	-115	0.05	524	0.21	1.18	2.70	4.37	48	0.87	1,942
China	0.15	4.76	-0.36	6.31	-14,597	0.44	4,044	0.17	7.02	-1.89	8.21	-20,857	1.28	7,291
Hong Kong	0.12	0.34	0.96	1.49	-444	0.82	864	0.12	0.23	1.00	1.34	-353	0.71	769
Japan	0.06	-0.61	2.88	1.57	7,318	-0.14	1,626	0.06	-0.70	3.02	1.40	8,367	-0.22	804
Korea	0.25	0.45	2.55	3.09	-987	-0.12	1,207	0.24	0.36	2.59	3.00	-875	-0.19	985
ASEAN	0.32	0.85	2.04	2.39	-1,536	0.01	1,972	0.32	0.77	2.06	2.34	-1,374	-0.01	1,808
South Asia	0.26	1.41	6.74	7.01	-1,234	-1.02	-91	0.26	1.33	6.85	6.96	-1,147	-1.04	-137
Aus/NZ	0.13	-0.36	1.95	1.64	415	0.18	849	0.13	-0.47	2.02	1.57	515	0.16	797
NAFTA	0.05	-0.64	1.80	0.89	10,238	0.04	4,884	0.05	-0.75	1.88	0.80	11,829	0.00	4,040
EU	0.10	-0.66	0.99	0.53	10,032	-0.06	6,053	0.09	-0.79	1.05	0.49	11,850	-0.08	4,970
Rest of World	0.29	1.11	4.61	5.20	-9,092	0.07	12,782	0.28	0.99	4.67	5.14	-8,002	0.06	12,339

Table 9 Changes in selected macroeconomic indicators, steady state results

Unit: %

Region	Scenario C							Scenario D						
	Real GDP	Real Investment	Real Export	Real Import	Trade Balance	Terms of Trade	Welfare	Real GDP	Real Investment	Real Export	Real Import	Trade Balance	Terms of Trade	Welfare
Taiwan	0.42	0.64	2.76	2.76	85	-0.02	1,038	0.81	1.55	3.47	4.81	431	0.71	3,179
China	2.18	5.45	1.65	3.53	-8,183	-0.43	12,627	3.02	7.72	3.86	8.86	-10,937	0.00	19,090
Hong Kong	0.33	0.40	1.26	1.44	-377	0.76	1,047	0.18	0.12	1.38	1.47	-252	0.71	844
Japan	-0.17	-0.60	0.00	2.00	2,947	0.11	-2,212	-0.21	-0.70	2.02	1.75	3,353	0.07	-3,740
Korea	0.46	0.52	0.14	2.99	-640	-0.19	1,786	0.37	0.33	2.96	3.11	-537	-0.24	1,349
ASEAN	1.07	1.35	0.56	3.04	-840	-0.16	4,953	0.93	1.12	2.91	2.84	-672	-0.17	4,248
South Asia	1.13	1.84	-0.15	9.05	-298	-1.45	2,731	1.05	1.66	9.00	7.17	-240	-1.46	2,363
Aus/NZ	-0.12	-0.57	0.27	1.58	257	0.30	175	-0.19	-0.73	1.54	1.50	305	0.31	-53
NAFTA	-0.25	-0.78	0.03	1.18	4,707	0.18	-12,148	-0.30	-0.92	1.16	0.79	5,445	0.17	-15,924
EU	-0.19	-0.67	-0.03	0.47	2,935	0.03	-7,404	-0.25	-0.81	0.42	0.32	3,349	0.02	-11,325
Rest of World	0.54	0.62	0.09	5.40	-592	-0.10	18,287	0.48	0.50	5.35	4.93	-247	-0.10	16,341

In the long run, therefore, the capital stock in Japan, Australia and New Zealand, NAFTA and the EU shrinks, whilst that of other regions expands. In particular, because China will attract much more FDI as a result of its accession, the increase in real investment in China is 4.76 per cent in scenario A, and 7.02 per cent in scenario B, much larger than the increases in other regions (see Table 8).

The scenario C results provided in Table 9 show that after considering the capital accumulation effect, the rate of change in real GDP in Taiwan increases from 0.17 per cent to 0.42 per cent, and that in China it climbs from 0.15 per cent to 2.18 per cent. In addition, real GDP declines in Japan, NAFTA, the EU and Australia and New Zealand because of the decrease in capital stock. We also find that China's exports expand by 2.73 per cent in scenario C, in contrast to the contraction in static cases. The scenario D results indicate that when incorporating the capital accumulation effect, Taiwan's direct cross-strait shipment and investment liberalization policies exert a much larger impact on the economies of Taiwan and China.

The rate of change in Taiwan's real GDP rises from 0.42 per cent to 0.81 per cent, whilst that of China moves from 2.18 per cent to 3.02 per cent. In addition, the rate of change in Taiwan's exports rises from 2.76 per cent to 3.47 per cent, whilst the rate of change in China moves from 1.65% to 3.86%. It is also worth noting that the real GDP of Hong Kong in scenario D does not increase as much as in scenario C, the rate of change falling from 0.33 per cent to 0.18 per cent. This may be attributable to the fact that once Taiwan adopts freer trade policies towards mainland China, Hong Kong's entrepôt role in their cross-trait economic relationship is likely to assume much lesser importance.

The Sectoral Impacts on Taiwan and China

Table 10 summarizes the static effects of the accession of both Taiwan and China on sectoral output, exports and imports. We find that on the whole, whilst Taiwan gains from its accession, the benefits are not shared by all sectors. As shown in Simulation A, there is expansion in the more capital-intensive and technology-intensive sectors in Taiwan, such as textiles, chemicals, petroleum, metal products, electronics and machinery equipment, and also in some service sectors, such as utilities, construction, transportation and communication; however, all other sectors shrink, particularly beverages and tobacco, motor vehicles, clothing, agriculture and mining.

Table 10 Sectoral impacts of WTO accession by Taiwan and China, static results

Unit: %

Sector	Scenario A						Scenario B					
	Taiwan			China			Taiwan			China		
	Output	Export	Import	Output	Export	Import	Output	Export	Import	Output	Export	Import
Agriculture	-0.25	-0.13	0.61	-0.85	0.08	5.51	-0.55	-0.41	1.97	-1.01	-1.26	6.43
Livestock	-0.24	-0.19	0.07	0.15	-2.05	1.99	-0.56	-2.72	0.25	0.18	-4.66	3.78
Forestry	0.28	0.94	0.31	0.62	-6.19	4.78	0.78	5.30	1.05	0.85	-9.29	7.82
Fishing	-0.30	2.51	6.00	-0.21	-1.09	8.03	-0.46	1.52	8.87	-0.24	-2.20	11.36
Minerals	-0.39	0.55	0.53	-0.39	-1.60	0.16	-0.67	7.55	1.32	-0.56	-2.05	0.98
Food	-0.28	0.37	1.79	-1.19	-2.28	9.22	-0.53	-1.20	3.17	-1.46	-4.43	10.55
Beverages	-2.19	-12.84	5.97	-4.24	1.26	82.08	-2.32	-2.52	8.23	-4.32	-1.72	85.75
Textiles	4.23	5.47	3.47	-2.61	1.84	8.40	9.52	12.49	8.30	-4.11	1.45	10.69
Clothing	-1.28	-1.42	2.34	-0.03	0.80	8.93	-3.18	-3.30	7.58	-1.12	-0.88	10.63
Petroleum	0.68	4.42	1.82	-1.53	0.31	6.63	1.28	4.73	2.41	-1.86	-0.77	7.15
Chemical	1.67	4.38	2.97	-1.58	1.50	4.55	3.27	7.80	5.03	-2.30	0.30	5.73
Ferrous Products	-1.63	3.16	6.71	0.02	-4.58	3.55	-1.82	5.58	8.37	-0.12	-6.10	5.87
Metal Products	0.60	1.83	2.47	0.30	-2.56	8.11	-0.30	0.40	4.75	0.33	-4.44	12.11
Motor Vehicle	-9.26	17.77	24.16	-1.47	-8.21	8.28	-11.57	10.98	26.21	-1.71	-12.08	10.99
Other Transport Equipment	2.73	5.05	1.81	-0.61	-6.08	9.06	1.88	4.70	3.04	-1.12	-9.76	13.61
Electronic Equipment	0.02	0.36	0.84	-1.06	-1.26	1.73	-1.78	-1.57	0.05	-1.84	-2.42	2.36
Machinery Equipments	0.34	1.13	1.11	0.03	-2.36	5.31	0.63	2.40	2.50	-0.10	-3.74	8.10
Other Manufacturing	-0.10	2.19	2.70	0.40	-2.04	5.60	0.04	3.89	4.14	0.49	-3.82	8.07
Electricity	0.26	-2.05	0.95	-0.25	-1.12	1.88	0.76	-6.24	3.47	-0.37	-3.49	3.57
Construction	0.37	2.61	6.40	4.44	-0.29	12.15	0.81	-0.64	8.79	6.55	-2.46	15.70
Trade	-0.12	1.71	3.02	-0.02	1.30	8.32	-0.07	-2.33	5.31	-0.06	-1.10	9.75
Transport	0.89	9.62	15.34	-0.42	8.52	17.17	0.10	6.72	16.91	-0.78	6.25	18.33
Communication	0.40	20.38	3.63	0.37	17.05	27.06	0.31	15.63	3.85	0.66	14.26	29.00
Financial Services	-0.30	2.74	5.58	-0.17	2.12	7.52	-0.45	-1.37	7.46	-0.17	-0.27	8.76
Other Services	-0.30	6.08	8.62	0.02	4.78	10.56	-0.27	1.93	10.96	0.19	2.29	12.14

These results suggest that Taiwan's recent competitive edge in the world market has shifted to capital- and technology-intensive products. In contrast, China's expanding manufacturing sectors tend to focus on metal products and other manufactured goods, indicating that China's production still relies heavily on the non-heavy manufacturing industries.

As regards changes in exports and imports, the Scenario A results in Table 10 show that, although production suffers in quite a few sectors in Taiwan, both exports and imports will expand in all sectors, with the exception of the agricultural and mining sector. The results clearly reveal the tremendous effects of liberalization on trade expansion. Trade becomes more vibrant as a result of liberalization and this is shown not only in the expansion of total trade volume, but also in the volume of intra-industry trade. In contrast, along with shrinking production within many sectors in China, exports from most manufacturing sectors also decline, with the exceptions of beverages and tobacco, textiles, clothing, petroleum and chemical products. However, as a direct result of its accession, imports expand in all sectors in China, contributing to a reduction in the balance of trade in China, as shown above.

A comparison of the simulation results for Scenarios A and B in Table 10 indicates that Taiwan's direct cross-strait shipment and investment liberalization policies does not affect the signs of sectoral effects but does affect the magnitude, with just a few exceptions. Taiwan's textile outputs and exports, for example, increase in Scenario B by 9.52 per cent and 12.49 per cent, respectively, in contrast to 4.23 per cent and 5.47 per cent in Scenario A. In China, the situation is reversed, with textile output falling by 4.11 per cent in Scenario B, as opposed to 2.61 per cent in Scenario A. Furthermore, in Scenario B, Taiwan's chemical output and exports increase by 3.27 per cent and 7.80 per cent, respectively, in contrast to the 1.67 per cent and 4.38 per cent of Scenario A. On the other hand, China's chemical output decreases, in Scenario B, by 2.30 per cent, as opposed to 1.58 per cent in Scenario A. These results suggest that Taiwan's freer cross-strait trade and direct investment policies will enhance the extent of specialization and division of labor across the Taiwan Strait.

Table 11 summarizes the steady-state effects of accession on the sectoral output, exports and imports of both Taiwan and China. A comparison of Scenarios A and C shows that the change patterns in Taiwan are very similar, apart from the fact that the magnitude of the effects in Scenario C is generally greater than in scenario A, because of the capital accumulation effect.

Table 11 Sectoral impacts of WTO accession by Taiwan and China, steady state results

Unit: %

Sector	Scenario A						Scenario B					
	Taiwan			China			Taiwan			China		
	Output	Export	Import	Output	Export	Import	Output	Export	Import	Output	Export	Import
Agriculture	-0.19	0.18	0.77	0.10	-2.11	8.61	-0.45	-0.38	2.42	0.34	-4.35	10.84
Livestock	-0.15	0.40	-0.58	1.32	-5.41	5.32	-0.36	-2.01	-0.24	1.83	-9.13	8.49
Forestry	0.36	1.43	0.61	2.26	-8.38	8.08	1.02	5.73	1.75	3.12	-11.75	12.06
Fishing	-0.19	3.02	5.71	0.57	-6.43	13.26	-0.24	2.13	8.45	0.87	-9.46	18.86
Minerals	-0.19	1.82	0.83	1.33	-4.27	3.89	-0.17	9.20	2.01	1.86	-5.66	6.22
Food	-0.19	0.57	1.81	-0.08	-1.34	10.18	-0.32	-0.84	3.24	0.13	-2.95	11.79
Beverages	-1.87	-12.33	5.64	-2.70	4.69	80.45	-1.68	-1.64	7.88	-2.15	3.39	83.22
Textiles	4.63	6.09	3.67	0.38	4.20	9.98	10.62	13.89	8.90	0.26	4.99	13.09
Clothing	-2.16	-2.88	2.95	3.27	4.86	8.28	-4.04	-4.77	8.77	3.89	5.41	9.51
Petroleum	0.98	4.76	2.14	0.62	1.40	8.64	1.95	5.13	3.06	1.18	0.67	9.89
Chemical	2.22	5.24	3.26	1.13	4.76	5.74	4.36	9.28	5.66	1.54	5.02	7.37
Ferrous Products	-1.27	3.75	6.85	3.00	-0.69	4.03	-1.00	6.81	8.67	4.04	-0.48	6.34
Metal Products	0.76	1.89	2.80	2.87	2.06	7.48	0.16	0.71	5.43	3.91	2.29	10.96
Motor Vehicle	-8.67	18.92	24.10	2.78	2.89	5.51	-10.45	12.95	26.29	4.23	3.64	6.81
Other Transport Equipment	2.86	5.05	1.83	3.28	4.45	6.12	2.28	4.86	3.23	4.35	5.34	9.01
Electronic Equipment	0.40	0.76	1.14	3.12	3.28	3.44	-0.94	-0.72	0.69	4.15	4.17	4.73
Machinery Equipments	0.63	1.40	1.17	3.19	2.85	4.71	1.22	2.91	2.81	4.34	3.79	7.01
Other Manufacturing	0.09	2.32	2.94	2.89	2.32	5.72	0.59	4.34	4.66	3.97	2.55	8.03
Electricity	0.54	-0.99	0.61	2.02	3.48	0.34	1.42	-3.89	2.73	2.82	3.34	1.19
Construction	0.50	2.66	6.42	5.21	3.11	10.98	1.25	-0.38	8.98	7.40	2.52	13.60
Trade	0.11	1.82	3.04	2.12	5.07	8.20	0.50	-1.84	5.43	2.96	4.46	9.36
Transport	1.11	9.85	15.53	2.24	13.28	17.06	0.62	7.20	17.33	3.00	13.14	18.00
Communication	0.66	21.00	3.83	2.52	27.30	24.22	0.94	17.23	4.36	3.65	28.97	24.70
Financial Services	0.04	3.63	5.41	2.02	7.85	6.93	0.38	0.62	7.15	2.91	8.01	7.75
Other Services	-0.16	6.14	8.66	1.82	8.90	10.40	0.06	1.93	11.24	2.72	8.27	11.74

In Scenario C, for example, Taiwan's textile output and exports increase by 4.63 per cent and 6.09 per cent, respectively, in contrast to the 4.23 per cent and 5.47 per cent of Scenario A. Chemical output and exports also increase in Scenario C, by 2.22 per cent and 5.24 per cent, respectively, in contrast to the 1.67 per cent and 4.38 per cent of Scenario A.

Nevertheless, as noted earlier, as a result of the significant increase in real investment in China following its accession, we find that in scenario C, China's capital-, technology- and labor-intensive sectors all expand, with the exception of the food and beverages and tobacco sectors. Similarly, Chinese exports also expand in most sectors, with just a few exceptions, such as the agricultural and food sectors. In addition, China's imports decline in most manufacturing industries as a result of the increase in domestic production. This suggests that the long-run effects of trade liberalization may be quite different from the short-run effects. It seems that following accession, capital inflows and capital accumulation will bring about tremendous structural changes in China's level of production and foreign trade.

Similar to the static results, a comparison of the simulation results for Scenarios C and D indicates that Taiwan's direct cross-strait shipment and investment liberalization policies does not affect the signs of sectoral effects, but does affect the magnitude, with few exceptions (see Table 11). Taiwan's textiles output and exports, for example, increase by 10.62 per cent and 13.89 per cent, respectively, in Scenario D, in contrast to the 4.63 per cent and 6.09 per cent of Scenario C. Taiwan's chemical output and exports also increase by 4.36 per cent and 9.28 per cent, respectively, in Scenario D, as opposed to the 2.22 per cent and 5.24 per cent of Scenario C. This suggests that, when considering the capital accumulation effect, the extent of specialization and the division of labor between Taiwan and China will be considerably enhanced, to the benefit of both economies.

Changes in Cross-Strait Trade Relations

The export market structures of Taiwan, China and Hong Kong are summarized in Table 12, under different scenarios. In general, Taiwanese exports will, to some extent, be diverted from other regions into China. As compared to the base year, when China's market accounted for 21.13 per cent, exports go up by 0.89 per cent in Scenario A, whilst in Scenario B they rise by 3.85 per cent. These results suggest that direct cross-strait shipments and a freer

investment policy will significantly increase Taiwan's dependence on exports into China.

There is, nevertheless, very little change in the share of the Taiwanese market accounted for by exports from China. For example, as compared to the base year, when the Taiwanese market accounted for 2.17 per cent of Chinese exports, in Scenarios A and C, this share is virtually unchanged, whilst in scenarios B and D, the share increases by only around 0.35 per cent.

It seems, in fact, that the import structure of the Taiwanese market will not change much under each of the different scenarios (see Table 13). For instance, as compared to the base year, when China's market accounted for 5.38 per cent of Taiwan's total imports, in Scenarios B and D, this share increases by 0.36 per cent and 0.66 per cent, respectively.

Conversely, the share of total imports into China accounted for by Taiwan, increases slightly more. For instance, as compared to the base year, when Taiwan accounted for 13.71 per cent of total imports, in Scenarios B and D, this share increases by 1.14 per cent and 1.24 per cent, respectively. All in all, these results suggest that direct cross-strait shipments and freer investment policy will significantly increase Taiwan's exports to China, thus potentially enlarging the current trade surplus between Taiwan and China.

Table 12 Export market structure of Taiwan, China and Hong Kong under alternative scenarios

Unit: %

	Taiwan	China	Hong Kong	Japan	Korea	ASEAN	South Asia	Aus/NZ	NAFTA	EU	Rest of World	Total
Taiwan												
Base Year	0.00	21.13	3.66	9.47	1.85	12.21	0.56	1.72	27.55	15.79	6.06	100
Scenario A	0.00	22.02	3.63	9.33	1.85	12.19	0.60	1.69	27.04	15.54	6.13	100
Scenario B	0.00	24.82	3.50	9.01	1.78	11.78	0.58	1.63	26.07	14.95	5.90	100
Scenario C	0.00	22.15	3.62	9.30	1.84	12.23	0.60	1.68	26.97	15.51	6.10	100
Scenario D	0.00	24.98	3.49	8.97	1.78	11.80	0.57	1.62	25.98	14.93	5.87	100
China												
Base Year	2.17	0.00	4.97	17.08	4.25	7.50	1.06	1.88	27.32	20.87	12.90	100
Scenario A	2.16	0.00	5.00	16.90	4.29	7.57	1.12	1.87	27.04	20.77	13.27	100
Scenario B	2.51	0.00	5.00	16.86	4.28	7.55	1.12	1.87	26.96	20.66	13.20	100
Scenario C	2.17	0.00	4.94	16.84	4.27	7.60	1.12	1.86	27.11	20.81	13.29	100
Scenario D	2.52	0.00	4.91	16.76	4.24	7.57	1.11	1.86	27.05	20.74	13.24	100
Hong Kong												
Base Year	1.85	18.76	0.00	4.40	0.74	6.96	0.69	1.44	27.69	14.51	22.96	100
Scenario A	1.82	19.38	0.00	4.31	0.73	6.96	0.70	1.42	26.91	14.09	23.69	100
Scenario B	1.81	19.27	0.00	4.32	0.73	6.97	0.70	1.42	26.97	14.1	23.71	100
Scenario C	1.82	19.5	0.00	4.31	0.73	6.98	0.70	1.42	26.85	14.07	23.62	100
Scenario D	1.81	19.41	0.00	4.32	0.73	6.98	0.70	1.42	26.89	14.09	23.64	100

Table 13 Import market structure of Taiwan, China and Hong Kong under alternative scenarios

Unit: %

	Taiwan	China	Hong Kong	Japan	Korea	ASEAN	South Asia	Aus/NZ	NAFTA	EU	Rest of World	Total
Taiwan												
Base Year	0.00	5.38	0.86	26.35	4.22	12.88	0.69	3.44	21.94	16.71	7.53	100
Scenario A	0.00	5.22	0.84	26.29	4.24	12.79	0.71	3.38	22.30	16.92	7.30	100
Scenario B	0.00	5.76	0.82	26.17	4.22	12.62	0.71	3.35	22.20	16.88	7.26	100
Scenario C	0.00	5.39	0.84	26.11	4.25	12.89	0.72	3.37	22.21	16.87	7.35	100
Scenario D	0.00	6.04	0.82	25.95	4.23	12.71	0.72	3.34	22.09	16.79	7.31	100
China												
Base Year	13.71	0.00	4.16	22.81	9.15	8.11	0.85	2.10	13.47	16.43	9.22	100
Scenario A	13.69	0.00	4.10	22.89	9.07	8.07	0.83	2.05	13.50	16.86	8.94	100
Scenario B	14.85	0.00	4.03	22.55	8.85	7.95	0.80	2.03	13.35	16.72	8.87	100
Scenario C	13.74	0.00	4.12	22.71	9.12	8.16	0.84	2.07	13.46	16.72	9.06	100
Scenario D	14.95	0.00	4.04	22.33	8.90	8.06	0.82	2.06	13.30	16.52	9.01	100
Hong Kong												
Base Year	5.45	13.97	0.00	13.48	7.42	15.06	0.62	2.62	13.67	19.28	8.43	100
Scenario A	5.46	13.87	0.00	13.49	7.39	15.01	0.65	2.60	13.69	19.36	8.48	100
Scenario B	5.32	13.73	0.00	13.54	7.42	15.05	0.65	2.61	13.73	19.44	8.51	100
Scenario C	5.46	14.11	0.00	13.35	7.38	15.11	0.66	2.59	13.6	19.21	8.54	100
Scenario D	5.34	14.1	0.00	13.38	7.39	15.13	0.66	2.60	13.62	19.24	8.55	100

CONCLUSIONS

Following the accession of Taiwan and China into the WTO, a current issue of controversy is how Taiwan plans to adjust its policies with regard to trade and direct investment across the Taiwan Strait. Although these activities have long been regulated by the Taiwanese government for political reasons, over the past two decades, Taiwan has nevertheless become one of the most important exporting countries to mainland China, as well as a source country for foreign direct investment (FDI). In this paper, we have applied a multi-regional computable general equilibrium model to analyze the impacts of liberalization of global trade in services and commodities in the aftermath of the WTO accession of Taiwan and China. The differences resulting from changes in Taiwan's trade and investment policies towards mainland China are also investigated.

We find that in the short run, most regions of the world will benefit from the accession of these two economies into the WTO, particularly Taiwan and China themselves. As a result of Taiwan's freer trade and investment policies, both economies will be in a position to seize even greater gains from the effects of global trade liberalization. As for sectoral impacts, in the short run Taiwan is likely to see growth in its capital- and technology-intensive sectors, whilst its agricultural, motor vehicle and clothing sectors will decline. In contrast, China's labor-intensive sectors will expand, whilst the capital- and technology-intensive sectors will contract to some extent.

However, when considering capital accumulation effect, we find that China's capital-, technology- and labor-intensive sectors will expand, with few exceptions. This suggests that in the long-run, capital accumulation and capital inflows as a result of the global trade liberalization following the WTO accession of both Taiwan and China will bring about tremendous structural changes in China's levels of production and foreign trade. This has significant policy implications for both developed and developing countries.

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Appendix Table A-1 Major Recipients of Taiwan's Outward Investment

	1991-1995		1996-2000	
	Average Amount (US$ million)	%	Average Amount (US$ million)	%
China	1,129	44.02	2,374	40.31
British Territories in Central America *	328	12.79	1,500	25.47
US	282	11.01	636	10.80
Singapore	45	1.74	246	4.18
Japan	21	0.81	112	1.90
Hong Kong	129	5.01	85	1.45
Thailand	77	3.02	73	1.24
Vietnam	82	3.21	69	1.18
Philippines	11	0.42	55	0.93
Canada	3	0.12	47	0.80
Malaysia	166	6.48	46	0.78
UK	56	2.20	15	0.25
Canada	3	0.12	7	0.12
Taiwan's Total Outward Investment	2,564	100.00	5,889	100.00

Note: * Includes the Cayman Islands, Virgin Islands and other British territories in the Caribbean region.

Sources: Investment Commission (2001), Statistics on Overseas Chinese and Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide to Mainland Industry Technology, Ministry of Economic Affairs, (December).

Appendix Table A-2 Major Sources of China's Inward Investment

	1991-1995		1996-2000	
	Average Amount (US$ million)	%	Average Amount (US$ million)	%
Hong Kong	13,504	58.76	18,336	42.94
US	1,697	7.38	3,836	8.98
Japan	1,567	6.82	3,459	8.10
Taiwan	2,242	9.76	2,915	6.83
Singapore	741	3.23	2,614	6.12
British Virgin Islands	90	0.39	2,556	5.98
South Korea	454	1.98	1,613	3.78
UK	379	1.65	1,308	3.06
Germany	193	0.84	932	2.18
France	136	0.59	670	1.57
China's Total Inward Investment	22,983	100.00	42,704	100.00

Source: China Statistical Yearbook (2001), China Statistics Press.

Appendix Table A-3 Tariff Equivalents in the Service Sectors, 1995

	Construction	Trade	Transportation	Communication	Finance	Other Services
Taiwan	25.00	9.55	108.37	131.25	23.26	39.02
WTO commitments	10.00	8.79	95.51	31.25	17.52	23.33
China	25.00	34.55	120.71	150.00	29.87	42.37
WTO Commitments	20.00	16.06	100.48	122.66	20.19	35.29
Hong Kong	32.00	30.91	98.70	166.67	27.88	43.42
Japan	5.00	4.55	117.86	61.11	17.59	31.14
Korea	16.00	21.36	121.49	158.33	24.34	40.54
ASEAN	21.20	32.45	105.91	160.86	29.14	39.47
South Asia	37.00	34.43	125.00	175.20	38.84	41.37
Australia New Zealand	8.50	11.36	117.91	159.72	15.95	30.61
NAFTA	11.67	11.06	82.98	164.81	18.12	33.49
EU	10.00	9.55	118.03	161.11	15.72	22.91
Rest of World	28.78	27.58	106.25	163.88	31.93	38.74

Sources:

[1] The 1995 figures for Taiwan are from Chou *et. al*. (forthcoming), and Taiwan's WTO commitments are calculated from the 'Report of the Working Party on The Accession of China' (2001), Addendum, Schedule CLII – The People's Republic of China, Part II – Schedule of Specific Commitments on Services, List of Article II MFN Exemptions, WT/ACC/TPKM/18/Add.2, (5 October).

[2] China's 1995 figure are from Hoekman (1995), and China's WTO Commitments are calculated from the 'Report of the Working Party on The Accession of The Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu' (2001), Addendum, Schedule CLIII – Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu, Part II – Schedule of Specific Commitments on Services, List of Article II MFN Exemptions, WT/ACC/TPKM/18/Add.2, (5 October).

[3] Figures for the remaining countries in this table are taken from Hoekman (1995).