

**Greater China's Accession to the WTO:
Implications for International Trade/Production
and for Hong Kong**

**A Paper Prepared for the
Hong Kong Trade Development Council**

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CONTENTS

I.	Introduction and Overview	1
II.	Modeling the Likely Impact of Greater China Accession to the WTO – Some Explanations and Caveats	4
	Introduction.....	4
	Some Background.....	4
	The Data Used in the Model	5
	A Brief Overview of the Analytical Structure	8
	The Policy Experiments.....	9
	Some Limitations of the Model	11
III.	The Effects of a WTO Accession	12
	Introduction.....	12
	The Macroeconomic Effects of Accession	14
	The Sectoral Impact of the WTO Accessions.....	22
	The Impact of the WTO Accessions on the Textiles and Clothing Sectors.....	25
IV.	REFERENCES	31
	TECHNICAL ANNEX.....	A-1
	Introduction.....	A-1
	General Strucure	A-2
	Dyamics	A-2
	Taxes and Policy Variables.....	A-3
	Trade and Transportation Costs.....	A-3
	Production Structure	A-4
	TheComposite Household and Final Demand Structure	A-4
	Labour Markets.....	A-5
	Services Barriers	A-5

List of Overviews

Overview I.1 – Comparing Selected Economic Indicators of Major Economies – 1999.....	1
Overview I.2 – Computable General Equilibrium Assessments of the Uruguay Round – Sectoral Distribution of Welfare Effects (in Percent of Row Total)	3
Overview II.1 – Sectors and Regions	7
Overview II.2 – Experiment Definitions	9
Overview III.1 – Who Hit Whom with Anti-Dumping Measures (ADMs), 1988-2000	21
Overview III.2 – Textile/Clothing Exports of Asian Countries 1990-99 (Shares/Rankings/Growth Rates).....	30

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EXECUTIVE SUMMARY

This paper offers a quantitative assessment of how Greater China's WTO accession will affect international trade in general and Hong Kong's economy in particular. The results discussed here are based on a computable model of the global economy. The model covers all world trade and production and includes intermediate linkages between sectors. It also allows for linkages between trade and investment, yielding medium- to longer-run scenarios. In effect, we examine the impact once changes in trade barriers and other similar measures have worked their way through the various economies and sectors.

Our assessment starts with a baseline scenario in which all 142 current WTO members have implemented their Uruguay Round and (if applicable) their accession commitments on tariffs. We then apply, step-by-step, various trade policy/market access policy changes in order to determine how production and trade flows react. The initial step covers the elimination of quotas on the exportation of textile and clothing products to industrialized economies. Such non-tariff barriers have distorted trade between developing countries (DCs) and industrialized countries (ICs) for over 40 years. Our modelling of their elimination by all current WTO members shows trade flows, especially for textiles and clothing, shifting to economies like India and Bangladesh, but also to Hong Kong and Vietnam -- in other words to economies where one would assume that such industries could be quite competitive. It also reveals how countries enjoying regional trade agreements will lose market share as the margin of their preferential treatment decreases after ATC quotas are eliminated.

The next two steps incorporate Mainland China (PRC) and Chinese Taipei into this quota elimination scenario. These experiments highlight how much China will profit from its WTO membership, through securing ATC textile and clothing quota elimination. We then apply tariff cuts and services liberalization to capture full WTO membership. This scenario also includes changes in the competitive position of the textile and clothing industry (based on a survey of companies in the sector.) The total impact involves a substantial surge in China's trade. China's exports increase by roughly 23% overall under the full WTO membership experiment. China's clothing exports more than double (surging over 150% in dollar terms).

The report also offers a detailed assessment of the sectoral impact of the same scenarios for Hong Kong, China (PRC) and Chinese Taipei. We explicitly focus on 7 sectors, accounting for roughly 80% of Hong Kong's exports. The results reveal how the Hong Kong SAR can profit, overall, from the accessions. However, the size of the gains is generally less than many might assume. This is because Hong Kong is not the only economy to profit. It helps to recall that the whole process modelled here reflects most favorite nation (MFN) principles. Since Hong Kong does not have a monopoly on trade and business ties to China, it must share the gains with other economies. The only sector which lost out of the 7 specifically examined was the clothing industry. Gaining the most were transport services and other commercial services. While financial services did show a slight gain, it has effectively lost some quasi-preferential treatment in the course of the accession process.

Perhaps the key message from these calculations comes from the tables covering China's (PRC) accession. China's textiles and clothing sectors virtually explode. Exports rise by 39

percent (textiles) and 168 percent (clothing), while output rises by 45 percent (textiles) and 125 percent (clothing). In essence these two sectors drive the developments that we trace across the PRC's economy. But China also pays dearly in terms of structural adjustment, with economic rationalization hitting sectors like those producing motor vehicles, primary nonferrous metals, and primary steel.

Mainland China (PRC) therefore has a tremendous restructuring job ahead of it. This can only be accomplished if other economies do not attempt to take advantage of newly created contingent protection rules. These rules, which are part of the protocol of accession, could permit other WTO members to keep protectionist pressure up against China (PRC) for 15 years. Beginning with special anti-surge clauses for textile and clothing products for 4 years, continuing on with general anti-surge clauses for 12 years and ending with treatment in antidumping cases which allows China to be treated as a "non-market economy for 15 years, sufficient weapons exist to keep China (PRC) at bay if necessary. And this triple jeopardy is actually topped off by the fear that anti-dumping measures against China (PRC) will also be on the increase. Our results for textiles and clothing point to a high probability that further safeguards will be implemented against China.

Concerning Chinese Taipei and its interactions with the PRC, there is an important degree of uncertainty. Our results may well be underestimates if MFN relations between the two new WTO members are allowed to truly flourish. Basically, there have been less than normal economic ties between the two economies. While bilateral restrictions are reflected in the basic data, they are not part of the liberalization scenarios. At the same time, both new WTO members may prefer to maintain prevailing bi-lateral restrictions. This is possibly as long as both sides (implicitly) agree not to take their bilateral grievances to Geneva.

The bottom line for Hong Kong is that Greater China's accession to the WTO brings with it tremendous potential. That potential is not just for Hong Kong. It is now more easily tapped by other WTO members as well. While Hong Kong entrepreneurs may still have an easier time in establishing new activities or expanding already established ones in the region, the WTO accession process will tend to shave down this advantage over time. In the service sector, in particular, multilateral WTO-based liberalization may erode Hong Kong's unique position in the region. New opportunities emerge from the accession. However, there are also new competitive threats, as North American, Japanese, and European firms in particular find it easier to enter China directly, and to compete with Hong Kong entrepreneurs in the region. While the fruits of Greater China's accession are on the table, it is now up to the hard working business community of Hong Kong to compete all the harder to procure them.

I. INTRODUCTION AND OVERVIEW

The coming accession of the People's Republic of China (PRC) and Chinese Taipei to the World Trade Organization is not only an economic event of global dimensions, it is equally important in a very symbolic manner. Let us recall: Hong Kong became a signatory to GATT in the very same year in which the Uruguay Round (UR) was initiated. And now, China (PRC) and Chinese Taipei are to be joining the WTO in exactly the same year that the next major round of multi-lateral trade negotiations is supposed to be initiated. Given the stellar economic performance of Greater China¹ economies over the last two decades, but in particular the considerable clout Greater China can now wield being inside rather than outside the WTO (see Overview I.1), there would seem to be reason enough to believe that the next round will more clearly carry signatures reflecting Greater China's preferences.

Overview I.1 – Comparing Selected Economic Indicators^a of Major Economies – 1999

	Greater China	USA	EU15	Japan
Area ^b	9635	9365	3245	380
Population ^c	1320	275	380	125
Trade ^d	340	695	795	420
GDP ^e	1380	8200	8450	4130
GDP – PPP ^f	4550	8200	7720	2960

^a: To some extent estimated. - ^b: 1,000sq.km. - ^c: Millions. - ^d: Billion US\$. - ^e: GDP = **G**ross **D**omestic **P**roduct in billion US\$. - ^f: PPP = **P**urchasing **P**ower **P**arity in billion US\$.

A glance at the numbers lying behind the above indicators emphasizes this contention:

- Growth rates of GDP over the past decade for Greater China were more than 200% higher than those for high income countries (basically OECD countries). And in the

¹ The term "*Greater China*" in this paper refers to the summation of the economies of China (PRC), Chinese Taipei and Hong Kong. It is sometimes used in referring to the impact of the accession of China (PRC) and Chinese Taipei on income, trade flows, etc. – in such cases it should be obvious to the reader that we are not also including Hong Kong in such scenarios. After all, Hong Kong already joined GATT/WTO in 1986.

case of industry value added, the growth rates for Greater China exceeded those of high income countries by over 300%.

- Exports of Greater China grew roughly 100% faster than those from high income countries throughout the decade of the 90s.
- With respect to Greater China's export performance vis-à-vis exports from all other countries to specific groupings of OECD countries (i.e. to EU15, Japan, Canada + USA and all OECD countries – see Tables 43 to 46) it can be shown that growth rates of exports from Greater China always exceeded those of total exports². The differences ranged from less than 50% in the case of Canada + USA to over 250% in the case of Japan. These trends are likewise reflected across the various commodity groupings.

While the above performance comparisons merely underline what might basically be considered to be common knowledge, the key unanswered question is, what will happen once China (PRC) and Chinese Taipei fully enjoy the same most favored nation (MFN) principles already extended to the 142 contracting parties in the WTO. It is the purpose of this paper to lay down a first-cut overview of what the accessions could mean in particular for Hong Kong, Greater China and – of course – the rest of the world. It focuses on key variables in this connection, namely on income changes, trade and shifts in production/market shares. It explores the dimensions of the WTO accessions by applying techniques, which can portray not only what happens, for instance, directly to trade flows when relative prices change, but can also track indirectly what the economy-wide and global-wide implications of these changes are. It is an application of cutting-edge technology using real data, verified linkage structures and observed reaction patterns to capture what we would consider to be the bottom line of applying the protocols of accession for China (PRC) and Chinese Taipei.

² In Tables 43 to 48 exports from Hong Kong and China (PRC) were derived from imports of the respective OECD countries from Hong Kong and China (PRC). This was done since comparable data otherwise available included re-exports. Hence the actual values shown in Tables 47 and 48 will differ from other sources. However, this means of calculations should not significantly influence either the calculation of shares or growth rates presented in Tables 43 to 46.

The analysis begins with a description of the structure of the model and its workings before moving on to a presentation and interpretation of the results. Generally speaking, the breakdown of the results by the various scenarios remains constant throughout the entire analysis. This allows the reader to more easily understand the analysis and the results, thus making comparisons between various tables much easier. The results are first broken down by the various scenarios for key economic variables (specifically trade, income and production) across all 21 economies/regions. Then the results for the individual economies of Greater China – that is, for Hong Kong, China (PRC) and Chinese Taipei – are broken down for the same set of scenarios across 23 sectors.

Finally, the scenarios are examined across all 21 economies/regions for those two sectors which have often played a key role in the economic development process of Asian economies in particular, namely textiles and clothing. While the relative importance of these two sectors has diminished in recent years, the degree of protection embodied in the high tariff rates plus the restrictive quotas on the importation of these products into most OECD countries from developing countries all imply that the liberalization of these sectors will produce significant welfare gains. As a matter of fact, an overview of the projected welfare gains from the implementation of the Uruguay Round agreements reveals that in these two sectors the largest gains across all major sectors could be expected to be achieved (see Overview I.2).

**Overview I.2 – Computable General Equilibrium Assessments of the Uruguay Round^a
– Sectoral Distribution of Welfare Effects (in Percent of Row Total)**

Study ^b	Model ^c	Sectors specified				
		Agriculture	Primary	MFA	Manufact.	Tariffs
1.		5		14		81
2.	I ^d	68		15	18	
	II ^e	38		12	49	
	III ^f	61		17	23	
3.	I ^g	9	3	35	53	
	II ^h	3	6	61	30	
	III ^h	3	7	50	39	
4.	I ^g	31		39		30
	II ^h	10		64		26
5.	I	46		29		24
	II	26		37		37
6.		34		40	14	12

^a Drawn from François et al. (1996, Table 1, last column); please see original for specifics. – ^b Study: 1 = Hertel et al. (1995); 2 = Harrison et al. (1995); 3 = François et al. (1995); 4 = François et al. (1994); 5 = Yang (1994); 6 = Nguyen et al. (1993). – ^c The Roman numerals designate model runs carried out under differing assumptions; the reader is advised to refer to the original tables in the articles to examine in depth the structure and the underlying assumptions. – ^d Static. – ^e Dynamic. – ^f Static; not perfect competition (PC). – ^g Steady state. – ^h Steady state, no PC.

The study closes with an executive summary of the results, drawing conclusions thereby about what this all could mean for Greater China and in particular for Hong Kong. This covers not only areas where the largest benefits are expected to occur, but areas where difficulties might be occurring, whether of inherent nature or rooted in the protocols of accession.

II. MODELING THE LIKELY IMPACT OF GREATER CHINA ACCESSION TO THE WTO – SOME EXPLANATIONS AND CAVEATS

Introduction

We next turn to a description of our modeling assessment of the likely impact of the accession of Greater China to the WTO. In other words, we are going to review how we will examine the changes which will occur with respect to foreign trade, output and income when China (PRC) and Chinese Taipei become WTO members. The approach we are taking involves the application of a large-scale, computer-based economic model (known as a “computable general equilibrium” or CGE model). CGE models are the prime tool of choice for assessment of the economic impact of regional, multilateral and global trade agreements. They allow for the assessment of liberalization across broad sectors of individual economies, including interactions between sectors that may result. The estimated effects from the CGE model at the national level, of course, reflect the interactions with neighboring economies as well as with economies/regions in other parts of the world.³ We provide a brief overview of the model here. More specific details and references can be found in the technical appendix.

Some Background

The model we use belongs to a family of economic models characterized by an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value added chain from primary goods, over continuously higher stages of intermediate processing, to the final assembling of goods and services for consumption. Linkages between

³ It would also be possible – if the necessary data existed at regional or state levels – to map the macro-economic and global results to the structure of production and employment at the state level in China (PRC). Given the large regional disparities in levels of development and major differences in the economic structures, the results of such an analysis would develop an even clearer picture of the national ramifications of a WTO accession.

sectors are both direct (like the input of steel in the production of automobiles) and indirect (like use of mining inputs into steel, which thus feed indirectly into automobiles, or rather feeds into machines which then manufacture automobiles). The model captures these linkages by modeling firms' use of factors and intermediate inputs when producing goods and services. The most important aspects of the model can be summarized as follows:

- i. it covers all world trade and production;
- ii. it includes intermediate linkages between sectors;
- iii. and it allows for trade to affect capital stocks through investment effects.

The last point means we model medium to long-run investment effects.

In the last two decades, the use of computable general equilibrium (CGE) models to estimate the impact of trade liberalization has moved from academic settings to the policy institutions dealing specifically with trade policies (see the discussions by Francois 2000; Francois et al . 1996; and Francois and Shiells 1994). While the results of these exercises are hampered both by the assumptions and the quality of the data available, their relevance in estimating the possible overall pattern of impact – i.e. both of direct and indirect nature – has proved to be helpful in policy formulation and the assessment of existing economic policies.

The Data Used in the Model

The data come from a number of sources. Data on production and trade are based on national accounting data linked through trade flows and drawn directly from the Global Trade Analysis Project (GTAP) version 5 dataset. (GTAP 2001; see Reinert and Roland-Holst 1997 for a discussion of the organization of such data for CGE models). The GTAP version 5 dataset is benchmarked to 1997, and includes detailed national input-output, trade, and final demand structures. Significant modifications have been made to the basic GTAP database. The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers. We have updated the dataset to better reflect actual import protection for goods and services (the basic GTAP database includes no information at all on trade barriers for services).

Basic data on current tariff rates come from the UNCTAD and WTO data on applied and bound tariff rates. These are integrated into the core GTAP database. These are supplemented with data from USTR and USITC on regional preference schemes in the Western Hemisphere. For

agriculture, protection is based on OECD and USDA estimates of agricultural protection, as integrated into the GTAP core database. Tariff and non-tariff barrier estimates are further adjusted to reflect remaining Uruguay Round commitments, including the phase-out of remaining textile and clothing quotas under the Agreement on Textiles and Clothing (the ATC). Data on post-Uruguay Round tariffs are taken from recent estimates reported by Francois and Strutt (1999). These are taken primarily from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules. All of this tariff information has been concorded to our model sectors. Services trade barriers are based on the estimates described in the Technical Appendix.

While the basic GTAP dataset is benchmarked to 1997, and reflects applied tariffs actually in place in 1997, in this study we of course want to work with a representation of a post-Uruguay Round world, that is before China (PRC) and Chinese Taipei have entered it. To accomplish this we have done the following:

- Before conducting any policy experiments whatsoever, we first run a "pre-experiment" in which we implement the remaining Uruguay Round **tariff cuts** across all countries except China (PRC) and Chinese Taipei. For the most part these cuts are already in place in the 1997 benchmark dataset.
- At the same time, the data are also adjusted to reflect regional preference schemes in Latin America (not represented in the core GTAP database).

The dataset we work with for the actual experiments is therefore a representation of a notional world economy (with values in 1997 dollars), wherein we have full Uruguay Round tariff cut implementation. We then structure the analysis as follows:

- We examine the elimination of **non-tariff barriers** incorporated within the ATC phase-out.
- Then the Greater China accession with reference to the above-mentioned post-UR tariff benchmark and the services liberalization is carried out.

The national accounts data have been organized to 23 sectors and 25 regions. (Note that we have included some detail on the value added chain linking fibers into textiles and clothing

production, to better capture the initial impact of the ATC on our base scenario.) The sectors and regions for this 23x25 aggregation of the data are detailed below.

Overview II.1 – Sectors and Regions

Model Regions		Model Sectors	
<u>abbreviations</u>	<u>description</u>	<u>abbreviations</u>	<u>description</u>
Australia	Australia	Wool	Wool
New Zealand	New Zealand	NatFibers	Natural fibers (cotton etc.)
China	Mainland China	PrimFood	Primary food production
Hong Kong	Hong Kong	OthPrimary	Other primary production
Japan	Japan	Sugar	Sugar
Korea	Korea	ProcFood	Processed food, tobacco, and beverages
Taiwan	Chinese Taipei (Taiwan)	Textiles	Textiles
ASEAN5	ASEAN5 member states ^a	Clothing	Wearing apparel
Vietnam	Vietnam	Leather	Leather products
Bangladesh	Bangladesh	ChemRef	Chemicals, refinery products, rubber, plastics
India	India	Steel	Steel refinery products
SouthAsia	South Asia	Nfmetals	Non-ferrous metal products
Canada	Canada	MotorVehs	Motor vehicles and parts
Mexico	Mexico	Electronics	Electronic machinery and equipment
USA	United States of America	OthrMach	Other machinery and equipment
CBI	Caribbean Basin Initiative countries	MnfcNEC	Other manufactured goods
ATP	Andean Trade Pact countries	Trade	Wholesale and retail trade services
Brazil	Brazil	Transport	Transportation services (land, water, air)
MERCOSUR	MERCOSUR ^b	Communic	Communications services
Chile	Chile	Construction	Construction
OtherLatAm	Other Latin America	FIRE	Finance, insurance, and real estate services
EuropUnion	European Union	CommServ	Other commercial services
Turkey	Turkey	OtherServ	Other services (public, health, etc.)
AfricaME	Africa and the Middle East		
ROW	Rest of World		

^aASEAN5 includes Phillipines, Thailand, Indonesia, Singapore, and Malaysia

^bMERCOSUR includes Argentina, Paraguay, Uruguay. Brazil is represented separately

A Brief Overview of the Analytical Structure

We turn next to the basic analytical features of the model (more thorough discussion is provided in the separate Technical Annex). On the production side, in all sectors, firms employ domestic production factors (capital, labor and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allows. In these sectors, products from different regions are assumed to be imperfect substitutes in accordance with the so-called "Armington" assumption.

This product differentiation by country/region of origin and destination is a very important feature of the model. Domestic demand in each region is made up of goods which are differentiated by country/region of origin (i.e. there are domestic goods and imports from trading partners). These goods are aggregated into a single consumption good for both intermediate and final use with a constant elasticity of substitution as suggested by Armington. Basically this assumption allows the demand for generically similar products (e.g. red wine) to be differentiated by source (e.g. France vs. Thailand)⁴. Domestic production in each economy/region is allocated among differentiated destinations (i.e. domestic markets and exports to trading partners). This specification also allows for substitution among destinations in response to commercial policy and exchange rate changes.

Prices on goods and factors adjust until all markets are simultaneously in (general) equilibrium. This means that we solve for equilibria in which all markets clear. While we model changes in gross trade flows, we do not model changes in net international capital flows. Of course, this does not by any means preclude changes in the level of gross capital flows.

Another important feature of the model involves a dynamic link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, including

⁴ What this means is actually quite simple: if prices of French red wine increase relative to those of Thai red wine, then the demand for French red wine will not decrease to the degree that might be expected based on normal price elasticities. The reasoning behind this is primarily based on the realization that seemingly like products are actually different. Whether such differences are based on objective or subjective impressions is irrelevant,it's all in the eye of the perceiver. Of course, at some point in time reality may overtake subjectivity, as perhaps occurred in the case of Californian wines. At first they were considered to be rotgut and thus a 100% relative increase in prices of palatable French red wine would not have the slightest impact on the demand. But now, after being showered with acclamation, relative price changes between Californian and French wines would more closely reflect changes in demand between similar products.

Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of the Uruguay Round have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. In the present application, we work with a classical savings-investment mechanism (discussed briefly in the appendix, and also in Francois et al 1997). This means we model medium- to long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

The Policy Experiments

We turn now to a description of the actual policy experiments. The experiments are outlined in Overview II.2. These involve alternatively a partial implementation of the FTAA, and a full implementation. The partial implementation corresponds to the likely mid-point of FTAA implementation, with 50% reductions in tariff barriers, a partial lifting of non-tariff barriers (modeled as a 50% reduction in the import tax equivalent of NTBs), and partial liberalization of services trade (modeled as a 50% reduction in the trading costs associated with services barriers).

Overview II.2 – Experiment Definitions

1	ATC quota phaseout for all current WTO Members
2	ATC quota phaseout for Mainland of China (PRC)
3	ATC quota phaseout for Chinese Taipei
5	Implementation of China's (PRC) WTO accession package
	industrial tariff reductions
	agricultural liberalization
	liberalization of cross-border services trade
	cost savings in textiles and clothing
6	Implementation of Chinese Taipei's WTO accession package
	industrial tariff reductions
	agricultural liberalization
	liberalization of cross-border services trade
8	Full accession (D and E)

Of particular importance in this study is our attempt to move the structure of the model as close as possible to reality in the real world. Hence, within the scenario "Implementation of China's (PRC)WTO accession package" is a step called "cost savings in textile and clothing." We have

designed this step to do justice to the overwhelming opinion of CEO's or similarly positioned executives in some 15 major companies interviewed in Hong Kong that, when China (PRC) is finally a full member of the WTO and quotas and other non-tariff barrier constraints on T&C products have been removed, they will shift production to China. Since such views were expressed by Hong Kong entrepreneurs operating around the world, it seemed logical to attempt to portray this as a measure which would impact on the relative competitive position of firms operating in China. And what do we mean by competitive position? We basically mean the ability of individual firms to meet market demand conditions at a competitive price).

In particular, those executives we interviewed were of the opinion that conditions for doing business in China (PRC) would be improved by joining the WTO **beyond the changes in relative prices due to tariff reductions and market access improvements stipulated in the protocol of accession**. This involves not only changes in external conditions, but critically also improvement in the conditions for doing business in China (PRC) – in this case specifically in the textile and clothing sectors. This includes the rules and administrative treatment of firms doing business, the underlying infrastructure, and related factors that impact on the general business climate.

To reflect these changing conditions, we introduced in this scenario an assumption which captures an emergent 10% cost advantage for firms doing business in textile and clothing production in China (PRC).⁵ What this does in the context of the model is to simply divert the demand for T&C products away from other countries to China (PRC). Globally, to the extent the firms we interviewed are correct (and there is little reason to doubt them), we therefore expect a shift in production toward China. Of course the actual implications for individual companies will depend on how they react. This is a strategic decision. Those companies that take advantage of these opportunities will shift sourcing and production to China. Those that do not will lose market share to those that do.

What does this imply for Hong Kong and Chinese Taipei companies? We expect that Hong Kong and Chinese Taipei companies, with production facilities throughout Asia and elsewhere, would be shifting some of them to China (PRC). The same applies to companies merely outsourcing in other countries; i.e. they would accordingly shift their demand to China (PRC).

⁵ The 10% figure seemed to be a reasonable estimate based on statements by the interviewed companies in the T&C industry. If the actual percentage advantage was higher or lower the corresponding adjustments would have to be made in the results..

However, if individual companies do not react in this way, they will simply find themselves losing market shares.

It is important to understand that the shift in business conditions we model is a *relative* shift and not an absolute difference. In other words, we can already infer (based on actual decisions about production and shipments, as reflected in the base data) how firms have evaluated the current business conditions in various markets. The basic conditions, including current conditions in China, Hong Kong, and elsewhere, are reflected in the current decisions of firms. In this experiment, what we do is introduce a relative shift in business conditions, given that firms also take into account existing conditions in various markets. Because this is modeled as a relative shift, it allows for other changes in business conditions (like dumping actions, NTBs, etc.) The point is that, given the underlying policy environment in the model, this scenario identifies the likely impact of the relative change in business conditions.

It is also important to understand that we do not identify which firms actually take advantage of these conditions. It is reasonable to expect, for example, that China (PRC)-based firms are in a better position to take advantage of improved conditions in China (PRC). This means that firms in other countries (like those, for example, in Turkey and Mexico) can be expected to see the changing conditions as an erosion in their own competitive position vis-à-vis Chinese firms. For firms in Hong Kong and Chinese Taipei, the message is that these changing conditions represent an opportunity. If they do not take advantage of it, other firms will.

It should be noted that – despite the normal assumptions in the model that exporters pocket quota rents – we do not really know whether quota rents accrue to the exporters or the importers. That quota rents might be shifting to importers in industrialized could well be possible in this era of Walmarts and Karstadts. While we did not run a special calculation to this extent, such an assumption would increase the welfare affects of liberalization in those economies (e.g. Hong Kong, China (PRC) which now "profit" from the ability to pocket quota rents.

Some Limitations of the Model

Since this exercise is based on an economic model, it is useful – as with all models – to keep the limitations of the exercise in mind. First, the model cannot forecast all future events. It is highly likely that unanticipated economic, political, and/or natural events will occur and will have important effects on some of the agents and activities identified in the model. (Consider the East Asian financial crisis, which was not included in Uruguay Round assessments, or the major

earthquake in Taiwan, or the ramifications of the recent terrorist attacks on the USA.) In this regard, it helps to think of the model as saying "in a world like the one we currently observe and with the assumed structure, if policies were different, this world would then be different in the ways reported in the tables." This is not the same as saying we are forecasting with precision. Rather, in the absence of surprises (which will occur of course in the next decade), we are making estimates of likely economic effects.

Another limitation is the simplifications embodied in the model. When we model economic policy, we try to develop a reasonable, though stylized representation of complex policy, demand, and production relationships. The trade-off is between keeping the model workable, and keeping it realistic enough to actually be useful. When building computational trade models, there are basic decisions that have to be made at the outset. These include working in partial or general equilibrium, using a static or dynamic framework, working with a single or multi-country model, and working with a single or multi-product model. Hence, all models are an exercise in informed compromise. Uncertainties arise because of problems with underlying data, estimates of elasticities, and necessary assumptions about reduced-form economic structures.

Yet another limitation is that this model does not identify which individual firms will win and lose from changes in business conditions. What the model does do is identify opportunities, and the changes in production and shipments (both domestic and international) needed to respond effectively to these changed conditions. The outcome for individual firms will depend on their response to these changes in conditions.

Having said this, we should emphasize that this class of models does actually do well in identifying resource, production, and trade shifts. For example, Kehoe (1996: [5] T.J. Kehoe. (1996) "Social Accounting Matrices and Applied General Equilibrium Models." Federal Reserve Bank of Minneapolis, Working Paper Number 563.) provides a comparison of CGE model-based estimates of the impact of EU Membership on Spain with actual experience. The CGE model performed quite well, and identified effects not anticipated at the time.

III. THE EFFECTS OF A WTO ACCESSION

Introduction

In the following three sections we examine the results of the China's (PRC) and Chinese Taipei's accession to the WTO. as produced by the model described in Chapter II. In interpreting these

results the reader needs to be aware of the time frame covered. By definition, we are modeling equilibrium conditions in multiple markets. This means that we are modeling the way markets are expected to look *after* firms have adjusted their behavior to reflect changes in market conditions. This adjustment is a complex process, involving the shifting of resources between sectors through hiring and firing of labor, installation of new plant and equipment, and decisions not to replace old plant and equipment as it depreciates. It also involves the shifts in consumer demand that follow from changing incomes and from changing relative prices. Obviously, all this does not happen overnight. Rather, this process, as reflected in the model, can be expected to take up to 7 years depending on the type of policy shock, but depending of course on the industry involved. In this case, the time frame to keep in mind for the whole economy is closer to 7 years, whereby for individual industries (e.g. the clothing industry) it could be considerably shorter. We are not modeling a 7-year adjustment path (i.e. what happens each month, quarter, or year), but rather we are looking at what happens once the adjustments have taken place and the market has settled down to reflect the new expenditure and production patterns that have emerged.

The scenarios – specifically broken down step-by-step in the table headings – remain the same throughout the entire analysis and correspond to the modeling sequences described in the prior chapter. By maintaining the same structure of the scenarios across all tables it is easier for the reader to draw comparisons. The calculations are shown for the given set of scenarios in the following sequence:

- First, the results are examined for the changes estimated by the model for specific macroeconomic variables (i.e. gross domestic product and exports; values for changes in terms of trade and investment are provided as additional background) across all regions/economies used in the model (Tables 1 – 5 and Diagrams 1 and 2).
- Second, the impacts of Greater China's WTO accession for Hong Kong, China (PRC) and Chinese Taipei are examined across all the sectors in the model (Tables 6 –17) for key macro-economic variables (i.e. output and exports; export prices provided as background). In these sectoral breakdowns certain economic activities (rows) of particular relevance to Hong Kong have been emphasized by printing them in bold-faced type.

- Third, the specific ramifications of the WTO accessions for the textile and clothing industries (Tables 18 – 23) are examined across all countries for key macroeconomic variables (production, imports and exports); Diagrams 3 and 4 portray the changes in exports.

The remaining tables contain, first of all, essential background information from the GTAP model for the reader and cover the actual level of protection contained in the model for China (PRC) and Chinese Taipei (Table 24), the breakdown of product/service sector exports by the 22 regions/economies in share and value terms (Tables 25 – 27), and an aggregation of these tables to just 10 regions/economies (Tables 28 – 30). Finally, aggregations of the 22 regions in Tables 24 to just 14 regions/countries for Hong Kong, China (PRC) Chinese Taipei are shown in Tables 31 – 42.

Secondly, complementing these GTAP data tables are those drawing on OECD data for exports disaggregated by relevant commodity groups for Hong Kong, China (PRC), Chinese Taipei and Greater China (Tables 43 – 48). They provide background on structure (shares) and trends (annual growth rates) of trade flows from the above economies to the EU15, Japan and USA + Canada for the period 1990-1999. For purposes of making comparisons between the export performances of Greater China economies, the total imports of the EU15, Japan and the USA + Canada – disaggregated by the same group of commodity exports – are also shown. Throughout all these OECD tables higher-than-OECD-average growth rates of exports from the Greater China economies are highlighted by printing them in bold –face type.

The Macroeconomic Effects of Accession

Gross Domestic Product (GDP): We next turn to estimates of the macroeconomic effects of accession. Beginning with the elimination of ATC quotas only for WTO members and focusing on percent changes in GDP (Table 2, col. 1) it is obvious that the new WTO members of the Greater China economies must lose out. The reason for this is simply that other economies profit from the newly created quota-free access for textile and clothing (T&C) products to major markets. It is in particular the Southeast Asian and the other South Asian countries, but especially India which profit from the improved access. The reasons underlying Hong Kong's losses can – in addition to being subjected to tougher competition from economies whose access to markets in industrialized was previously more highly restricted by smaller quota allocations – be primarily attributed to the loss of quota rents.

However, loosing out far more than the Greater China economies are those which enjoyed preferential access to the markets of the EU15 and North America respectively, namely Bangladesh and Mexico. And, when China (PRC) + Chinese Taipei become WTO members, hence no longer facing quotas, these losses then double, in the case of Bangladesh amounting to -0.54 and in the case of Mexico to over -2% .

All in all, the elimination of the ATC quotas induces an increase in GDP by over 1% for China (PRC) and a modest 0.18% for Chinese Taipei. Hong Kong, on the other hand, loses out overall by -0.12% . While actually profiting marginally from China's (PRC) gaining quota-free access to major markets (see Diagram 1), it loses almost as much again from Chinese Taipei's accession. The driving force behind this improvement vis-à-vis China (PRC) must be seen in Hong Kong's function as a service hub, but not only just for the textile and clothing industry. Referring to Hong Kong's export structure (see Table 25) it can be seen that those services which can be associated with such hub functions (i.e. wholesale/retail trade, transportation services and commercial services) account for close to 50% of export receipts⁶.

Of course, when all the ramifications of the entire WTO accession package are taken into consideration, **the bottom line for China (PRC) is a massive 5.8% increase in GDP. Hong Kong, on the other hand, reveals just a slight increase (0.15%), but Chinese Taipei suffers a loss of about a third of a percentage point.** This loss suffered by Chinese Taipei is the result of its own tariff and service sector liberalization and is rather sizeable (almost -1%). It is furthermore interesting to note that the total liberalization package prompted by the WTO accession process did not lead to a large enough increase in competitiveness to permit Chinese Taipei to register a gain over any of the economies/regions used in the model⁷.

If there is an overall message to be drawn from these initial results (in Table 2) it is that China's (PRC) WTO accession will be for the benefit of nearly all regions/economies. In many cases the pattern which evolves after the liberalization of ATC quotas for Greater China is not

⁶ It should be pointed out that the *wholesale & retail trade* sector also incorporates all those activities surrounding the importation and exportation of merchandise trade. It thus picks up the value-added in entrepot trade as well as the revenue produced by the port facilities themselves. Since it only insufficiently picks up domestic purchases by foreigners, its share is underestimated.

⁷ In more economic terms this is stating that while Chinese Taipei had a rather optimal tariff structure, China's (PRC) tariff structure was so highly distorted and redundant that its restructuring in the course of the WTO accession process produced significant welfare gains.

significantly changed by the total liberalization of tariffs and improved access to the service sectors or rather changes point in the same direction. For instance, in the case of India the initial gains, mentioned when the textile and clothing quotas were removed, turned into large losses across the remaining scenario, thereby more than halving the benefits. There are notable differences, however, as in the case of Bangladesh, which loses across the ATC liberalization scenarios, but regains about 75% of these losses during the tariff and service sector liberalization scenarios.

There are two interesting patterns which evolve and reveal how well the model picks up prevailing interactions:

- While Japan and the ASEAN5 countries just marginally profit from China's WTO accession, the results for Korea and Vietnam reveal a definitely larger increase in GDP. Perhaps more interesting in this respect than just the absolute size of the change, is the structure of changes. Whereas Korea profits more from China's (PRC) accession, in the case of Vietnam it is Chinese Taipei. In other words, the model's results would seem to correctly reflect what would normally be deduced from prevailing economic trade structures.
- Of all the countries losing as a result of China's (PRC) WTO accession it is Mexico which can expect to be most negatively affected. After all, as a member of the North American Free Trade Agreement (NAFTA) it profits from quota-free access to the US and Canadian markets in the area of textiles and clothing. On top of that, it enjoys tariff preferences and special market access arrangements in other product and service sector areas as well. Hence, to the extent that these preferences are removed (as in the case of quotas) or reduced (as in the case of tariffs) the advantages for Mexico decrease and accordingly negate the positive effects of liberalization. The model reveals precisely such an outcome: On top of an initial loss of -1.07% due to the elimination ATC quotas by all WTO members, an additional loss of -0.99% can be attributed to China (PRC) no longer being subjected to ATC quotas and -0.77% due to the tariff cuts and services' liberalization.

Exports: Generally speaking, the results for exports (see Table 3) widely reflect the overall results of model for the economy in terms of changes in GDP. Let us begin with an examination

of the overall impact of the elimination of ATC quotas. It is primarily only Hong Kong, Bangladesh and other South Asia which show significant shifts vis-à-vis the GDP results. In all three cases does the sign of the overall impact of the elimination of ATC quotas shift from negative to positive. This switch, which was particularly large in the case of the South Asian economies, can be attributed to relatively large decreases in the terms of trade (see Table 4).

The size of the impact of the elimination of ATC quotas on Greater China's exports is considerable in the case of China (PRC) – +5.87% – and very considerable in the case of India – +12.91%. That the other South Asian economies also exhibit the next highest export growth rates underlines the potential which stands to be tapped if these economies can maintain efficient economic policies. The reason for Mexico and Turkey being the two largest losers in this constellation is – as noted above – due to their loss of preferential treatment as concerns the elimination of quotas.

In turning to the overall impact of Greater China's WTO accession on exports, the pattern can be seen to be similar to GDP. While the gains for China (PRC) – +23.08% – dominate even more than in the case of GDP, it is Chinese Taipei – +7.38% – which this time reveals major gains as a result of the tariff cuts and liberalization in the service sectors. In light of these two large gains on the part of China (PRC) and Chinese Taipei, it is hardly surprising that – given the strong links and interactions between Hong Kong, China (PRC) and Chinese Taipei – Hong Kong achieves the fourth highest increase among all the economies included in the analysis, namely +2.37%.

Despite the relatively large size of these results for Greater China it is quite probable that in reality the growth rates could be larger. The reason for this must be seen in the nature of the model used, which calculates the impact of tariff rate changes and services sector liberalization based on specific reaction parameters. However, in the case of Greater China the trade ties between China (PRC) and Chinese Taipei have been constrained by non-tariff barriers, which have led to highly distorted trade flows between the two economies. While the GTAP model data base does try to correct for such trade diversion via Hong Kong, it is quite probable the actual trade flows are higher. Furthermore, to the extent that Greater China does develop into an economic area where both tariff and non-tariff trade barriers between the individual economies are but of nominal nature, then agglomeration economies may be engendered, export growth rates accordingly accelerated and GDP expanded at an even faster rate.

Needless to say, all of the above conclusions with respect to trade between China (PRC) and Chinese Taipei rest on the assumption that WTO most favored nation (MFN) principles are correctly adhered to once these two parties become WTO members. This is a big step from the current situation, where direct trade links between these two economies are virtually non-existent. And it is a step which carries with it the possibility of shifting economically driven trade flows into the realm of politics. What will happen if one party feels that exports to the other party are not being treated in line with WTO principles? In other words: what will happen if prevailing non-tariff barriers to trade between China (PRC) and Chinese Taipei are only incompletely removed?⁸ Without being able to answer this question, it is assumed in this paper that WTO MFN principles apply between China (PRC) and Chinese Taipei. In doing so it is at least possible to show how much is at stake if they are not heeded⁹.

Table 3 also reveals how sharply the South Asian economies lose as a result of China's (PRC) entering the WTO. As a matter of fact, all the gains made after quota liberalization for Bangladesh and other South Asian economies are wiped out by the time the final tariff and liberalization scenarios are carried out. While India "only" suffers a 50% drop in the increase in exports registered after the elimination of ATC quotas for WTO members, it does chalk-up the largest decrease as a result of the tariff reductions and services sector liberalization by China (PRC).

⁸ The reader must realize that the WTO can only deal with trade policy issues and market access behavior not conforming to WTO principles if one of the contracting parties involved explicitly brings the issue to the attention of the responsible WTO dispute settlement bodies. If, however, two contracting parties – for whatever reasons possible – decide to ignore bilateral infringements of WTO principles, then this is solely within their own jurisdiction. This is all the more the case, given that the WTO operates strictly between contracting parties, without interventions from NGOs or even individuals from the affected economies. The latter would only be relevant if the WTO recognized consumer property rights within the economies of individual contracting parties. Since consumer property rights, that is the right of consumers to demand application of prevailing domestic laws to their rights in the same way that businesses demand from governments that their rights are protected, such behavior on the part of contracting parties cannot be contested.

⁹ What this implies for Hong Kong is of course not in the model either, as assumptions about new trade routes between China (PRC) and Chinese Taipei would have to be made. Whatever, the impact on Hong Kong would be considerable, knowing how important the value added in carrying out trade and entrepot trade has become. This would be an exercise in itself, and one which would highlight how important it is for Hong Kong to ensure that its hub function is second to none in the area. Since it is obvious that over the longer run the physical port facilities in Hong Kong could have difficulties in being able to handle to massive increase in trade which China's WTO entry is expected to induce, the question would have to be asked as to how its global hub function can be preserved. One possibility would be to specialize on offering premium services with more efficient upstream linkages and faster connections on the downstream side. Such premium services – which could also include fast inter-modal interfacing in Hong Kong – would help compensate for the disadvantage of not being directly next-door to major markets in able to be able to better participate in just-in-time manufacturing linkages.

Among the other economies which profit from Greater China's WTO accession are all the industrialized economies. In particular the United States gains noticeably from Greater China's WTO accession, whereby almost 60% of the increase can be attributed to the elimination of ATC quotas and 40% to tariff cuts and services liberalization. It is the fifth largest increase achieved by the economies in the model. This must be considered to be good news for Greater China since it was the United States which negotiated the ominous "triple jeopardy" clauses into China's (PRC) Protocol of Accession. The three contingent protection clauses can be described as follows:

1. The first applies to individual textile and clothing products, which can be hit with special safeguards over a **4 year period** through 2008.
2. The second covers all individual products – including textile and clothing products – and these can be hit by safeguards **over a 12 year period**.
3. The third deals with China (PRC) and applies to those cases where anti-dumping proceedings have been initiated against the economy. In such cases the Chinese (PRC) economy will be considered a non-market economy over a period of **15 years after accession**, when calculating antidumping margins. There is a very strong likelihood of not only higher anti-dumping margins, (see forthcoming article by Messerlin, Mirus, Morkre, Scholnick and Spinanger), but more importantly of a greater number of AD cases.

But even if the promised liberalization moves ahead, there is the problem of contingent protection under the standard GATT/WTO rules. Textile and clothing trade has been somewhat sheltered from standard safeguard measures and but few measures regarding dumping of T&C items have been instituted. However, once the ATC cover is lifted, the U.S. and EU may feel compelled to take new measures under safeguards or dumping and countervailing duty regimes. The rush of developing countries to implement anti-dumping regimes of their own, has greatly weakened their moral case against the use of such mechanisms in the OECD.

Nonetheless, two issues need to be pointed out. First of all, the official ATC term "effective implementation" of T&C products into MFN principles tends to sound like a farce, given insights into the actual structuring of the liberalization process . How is this supposed to be interpreted otherwise, in light of the US liberalization schedule which integrated foreign-made

foreign flags in the second tranche as of 1/1/98, but foreign-made US flags not until the final tranche in 1/1/05?

Secondly, and most important, there are ways of getting around the ATC safeguards. One of them is the use of anti-dumping measures (ADMs), the other is applying technical barriers to trade (TBTs). Overview III.1 shows the extent to which the various economies have been dumping on each other. But more basically, the entire process of initiating anti-dumping proceedings must be subject to revision, since in the prevailing legislation across all countries that have anti-dumping legislation (which Hong Kong doesn't!), it is the respective industry itself which is responsible for requesting an AD investigation.. In the past such requests have more than occasionally been founded on outright incorrect, if not fabricated information about who is dumping and how severe the impact of the “dumped” imports already is¹⁰. Knowing that the initiation of such proceedings is already sufficient to keep small and medium size exporters from continuing delivery of such products and other exporters from competitively pricing their products (see Messerlin [1989] on this issue), it is essential that much tighter conditions be applied to filing for ADMs.¹¹ Fortunately anti-dumping rules are expected to be on the agenda of the 2001 WTO Ministerial.

As concerns technical barriers to trade, the current situation is even more vague, since the right of individual countries to introduce measures they feel are necessary is nowhere questioned in the UR Agreements. The measures merely have to be applied in a manner which does not discriminate between foreign and domestic producers. Not even the stipulated conditions under which the TBTs are applied can be questioned, as these too lie in the fief of the individual countries. So far there does not seem to be a proliferation of such measures enacted vis-à-vis T&C products with perhaps the implicit intention of acting as contingent protection. But a forewarning is essential, knowing that these TBTs are promulgated in such a manner that their actual impact can hardly be judged.

¹⁰ The EU, for instance, permitted antidumping proceedings concerning fertilizer to be initiated against Belarus and some other Eastern European countries, only to announce two years later that most of these countries had not even exported such products to the EU during the relevant time period.

¹¹ For a general overview of antidumping measures from 1987-97 see Miranda et al. (1998).

Overview III.1 — Who Hit Whom with Anti-Dumping Measures (ADMs), 1988–2000^a

Economies initiating ADMs	Economies hit by ADMs								
	JAP ^b	NA	WE	ANZ	LA	ASIA	MR/AF	EE/CIS ^c	Total ^d
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1988–1991 ^e									
N. America (NA) ^f	15	16	30	1	22	46	3	10	143
W. Europe (WE) ^g	11	2	5	0	3	23	3	23	70
Australia/N.Zealand (ANZ)	7	10	28	1	12	36	4	4	102
Latin America (LA) ^h	4	16	8	0	5	6	0	1	40
Asia ⁱ	1	1	3	0	0	0	0	0	5
Med-Rim/Africa (MR/AF) ^j	0	0	0	0	0	0	0	0	0
Total	38	45	98	2	42	111	10	38	384
1991–1994 ^e									
N. America (NA)	15	28	78	7	30	60	3	31	252
W. Europe (WE)	3	2	0	0	2	56	10	39	112
Australia/N.Zealand (ANZ)	8	13	55	0	9	101	11	4	201
Latin America (LA)	1	31	8	0	15	46	3	16	120
Asia	5	2	0	0	3	9	0	1	20
Med-Rim/Africa (MR/AF)	0	0	2	0	0	8	0	11	21
Total	32	76	144	7	59	282	28	102	730
1994–1997 ^e									
N. America (NA)	8	9	17	0	12	30	5	7	88
W. Europe (WE)	5	3	1	0	2	51	3	14	79
Australia/N.Zealand (ANZ)	0	3	12	0	1	32	6	1	55
Latin America (LA)	0	17	20	1	36	53	3	27	157
Asia	5	10	17	0	1	30	1	13	77
Med-Rim/Africa (MR/AF)	2	3	21	0	1	18	3	4	52
Total	20	45	88	1	53	214	21	66	508
1997–2000 ^e									
N. America (NA)	12	7	28	1	15	43	6	14	126
W. Europe (WE)	5	5	0	1	4	76	9	34	134
Australia/N.Zealand (ANZ)	1	4	23	0	2	50	3	3	86
Latin America (LA)	4	18	31	3	34	34	7	39	170
Asia	11	5	20	3	1	66	2	24	132
Med-Rim/Africa (MR/AF)	0	3	21	2	4	46	8	8	92
Total	33	42	127	10	60	316	35	125	748
Note: the shaded areas identify anti-dumping measures applied against economies in same regional group.									
^a Actual numbers of ADMs against countries in heading. – ^b Japan. – ^c Eastern Europe and former CIS countries. – ^d Actual numbers, sums may not add to total since not all countries included. – ^e Years run from 1/7 to 30/6. Based on sums of all measures in the individual years. – ^f Canada and USA. – ^g EEC and EFTA. – ^h Central and South America plus Caribbean countries. – ⁱ From Mid-East (excluding Israel) to Korea (excluding Japan). – ^j Med-Rim = Mediterranean rim countries from Morocco to Turkey; Africa = all other countries in Africa									

Source: GATT/WTO documents of Committee on AD practices.

The overall results of the estimates of Greater China's WTO accession are comforting to the extent that most major economies profit from these developments, and hence have a self interest in ensuring that these profits actually do accrue to them. However, the danger in this connection lies in the time frame in which these changes take place. If the changes occur relatively quickly, then the chance is all the greater that contingent protection measures – like ADMs – may enjoy renewed vitality. And this would be all the more the case, the slower the world economy is moving. It would also become more probable if the inroads made by greater China into other countries' markets were precisely in those areas which have long been sensitive to increased foreign competition. Let us accordingly move on to an examination of the sectoral impact of Greater China's accession to the WTO.

The Sectoral Impact of the WTO Accessions

In reviewing the impact of Greater China's accession to the WTO the results of the 23 sectors shown in Overview II.1 are presented here for each of the three economies (Tables 6-17). The presentation follows the same set of scenarios used in the macroeconomic analysis. Of the four tables produced per economy the results covering percent change in output and percent change in exports will be discussed here.

In the case of Hong Kong the value of the exports from the seven sectors considered to be important accounted for roughly 80% of its exports in the baseline data set (see Table 25).¹² In the case of China (PRC) the shares of these sectors accounted for almost 40% of its exports; the corresponding shares for Chinese Taipei amounted to almost 50%. For Greater China (i.e. the sum of Hong Kong, China (PRC) and Chinese Taipei) the shares accounted for roughly 50% of its exports (see Table 28).

In interpreting these numbers the reader should refer to the bottom line in the respective tables, which is drawn from the overall results for output (Table 2) and exports (Table 3). Stress will be placed in this discussion on. Col. 4, which covers the total elimination of quotas and Col. 7,

¹² Additional tables have been provided for the reader to gain further information on the structure of the trade flows. Table 26 looks at the shares of each country in the global exports of a specific sector. Table 27 provides the raw data for Tables 25 and 26. Tables 28 –30 provide the same sectoral breakdowns as in Tables 26-28, but aggregated to regional groupings of economies. Tables 31-34 provide background on the structure of exports by sectors from Hong Kong, China (PRC), Chinese Taipei and Greater China to 13 specific regions/economies. Tables 35-38 use the same data for the Greater China economies to examine the sectoral shares in the exports to a given region/economy. Tables 39-42 provide the raw data for the tables 31-38. In addition to the GTAP tables background on the export performance of Hong Kong, China (PRC), Chinese Taipei and Greater China to OECD economies is presented in Tables 43-48.

which covers the tariff cuts and services liberalization, but in particular on Col. 8, which shows the total impact of Greater China's WTO accession.

The Sectoral Results for **Hong Kong** (see Tables 6 and 7)

- The *output* losses accruing to Hong Kong's **textile and clothing industries** (−9.35% and −6.71% respectively) basically do no more than reflect what has already been going on for years in these two sectors, which account for some 20% of Hong Kong's exports of goods and services. While the elimination of ATC quotas still left a sizeable increase in output (+2.69% and +8.25% respectively), the tariff cuts and services liberalization drastically undermined the competitiveness of these sectors.

The impact on *exports* is, however, not as devastating (+2.73% for textiles and −2.32% for clothing), given Hong Kong's role as a regional hub. And actually the overall all results for the T&C sector are no doubt considerably more positive for two reasons. First of all the highly positive impact of the WTO on China (PRC) means that all those Hong Kong companies which have production and sourcing ties with China¹³, will be strongly profiting from the accession, but this does not show up in the results, since capital flows are not picked up in the GTAP model. Secondly, some of the impact can be found in the wholesale/retail trade sector which picks up entrepot trade.

- The **electronics industry**, which accounts for almost 11 % of Hong Kong's exports, reveals an above average increase in output (+2.42%), stemming entirely from China's (PRC) tariff cuts and services liberalization. Here, and in the area of other machinery & equipment (covering thereby the toy industry as well), the cross border division of labor has no doubt proved to be of utmost importance. This can be seen all the more when the change in the value of exports is examined: the tariffs cuts and liberalization of the service sector in China (PRC) induce an increase by some +3%.
- The **wholesale and retail trade sector**, accounting for almost 40% of Hong Kong's exports, does not profit from the Greater China accession to the degree that one might expect, even if the growth on the export side (i.e. due to the tariff cuts and service sector liberalization) is not insignificant. On the one hand weak performance is due to the indirect impact of the ATC quota elimination. On the other hand there are no doubt very weak linkages between the real retail sector and China (PRC).

¹³ It has been estimated that perhaps 50% of the exports of textile and clothing products from China or directly or indirectly attributed to Hong Kong companies.

- **Transport services**, which account for 4.3% of exports, expand just marginally more than output in Hong Kong as a whole. However, exports of transport services – which is where the impact of the WTO accession would be expected – expand considerably faster than all other service exports. This has to be viewed with a certain degree of caution, since the model does not take into account the probable development of direct links between China (PRC) and Chinese Taipei.
- **Financial/insurance/real estate services** (less than 1% of exports) profit from the tariff cuts and services liberalization, but the indirect impact of the ATC quota liberalization dampens the overall impact. This becomes even more apparent in the export sector, where the impact of tariff cuts and services liberalization more than compensate for the negative impact of the quota elimination. It also has to be remembered that when China (PRC) opens up its service sector to other countries under most favored nation (MFN) conditions apply, any advantages Hong Kong companies might have had will disappear. Hence the relatively small output impact reflects the increase in competition.
- In the area of **commercial services**, which accounts for 3.5% of Hong Kong's exports, small, but above-average output gains are registered. But more important are the sizeable gains made in the export sector, namely +3.2%.

Overview of the Sectoral Results for **China (PRC)** - see Tables 10 and 11)

There are two major messages which can be read out of the results of the impact of China (PRC) joining the WTO.

- First, the elimination of quotas on the exportation of textile and clothing products, the tariff cuts on textile and clothing products, plus the increased competitive position of China with respect to producing textile and clothing products (an imputed additional 10%) drives the overall gains registered by changes in output and exports. Although these gains may seem exceptionally large, they basically do no more than reflect the annual growth path that China has followed over the last ten years. In other words, the 5-7 year time frame mentioned at the beginning of the chapter with respect to realizing the impact of changes in economic parameters is completely conform with these results.
- Secondly, the major restructuring which will have to occur in the automobile industry is fully in line with what was expected. Very high tariff rates combined with regionally restricted production facilities, led to a degree of inefficiency which implied that products

were basically not competitive. Hence, opening up China's (PRC) market to competition means massive upheavals. But it also implies that new firms wanting to establish production facilities will be able to do so and then offer products at significantly lower prices.

All this means that opportunities are being created in China (PRC) for entrepreneurs, who can perceive of the chances being created by the WTO accession process. In particular foreign firms should be able to move into these areas and/or cooperate with firms in these areas in order to produce at prices, which will not only allow the consumers in China (PRC) to increase their welfare, but also permit export markets to be serviced. Obviously, all these developments mean that other economies around the world will come under considerable pressure.

Overview of the Sectoral Results for **Chinese Taipei** (see Tables 14 and 15)

Given the fact that the degree of protection afforded by the Chinese Taipei tariff structure was relatively moderate, there are only two sectors where major shifts will be occurring, even if the importance of these sectors for trade is minimal. The sectors are clothing and motor vehicles and the nominal rates of protection lie 200% to 500% above other manufactured products. In the case of clothing the sector will no doubt migrate to the China (PRC), but be supplied to some degree by the textile industry which shoed a sizeable gain both in domestic output as well as in exports. As concerns the automobile industry, it will be subject to a similar process as in the case of China (PRC). However, given the size of the Chinese Taipei market, it will hardly draw in numerous new producers, but rather tap the potential that lies in other economies.

It needs to be underlined again in connection with the interaction between China (PRC) and Chinese Taipei that the results of the model – given the less than normal economic ties over the past years between the two economies – may well be underestimates when and if MFN relations between the two new WTO members are allowed to flourish. Should, however, both new members prefer to maintain prevailing bi-lateral restrictions, then the results of the model will only be marginally dampened, since its inherent structure emphasizes global rather than bilateral ties. Of course a more basic problem arises in that the impact of Chinese Taipei's trade on Hong Kong and China (PRC) is probably only incompletely captured in the data base.

The Impact of the WTO Accessions on the Textiles and Clothing Sectors

Given the above-mentioned massive shift of resources caused by the elimination of ATC quotas and the liberalization of tariffs, it seems to be essential to highlight this sector a little more. While it might seem like dealing with dieing remnants of the "old economy", this sector still

commands almost 25% of China's (PRC) exports and up to over 80% in the case of Bangladesh. And needless to say, if there ever was an industry which indelibly put its stamp on the economic success of Hong Kong for a long period of time, then it was the textile and clothing industry (TCI).

Although the TCI is still Hong Kong's largest manufacturing industry (about 40% of manufacturing value-added and 50% of domestic exports), the manufacturing sector itself now accounts for a mere 5% of GDP as opposed to roughly 40% some 30 years ago. Unfortunately these latter figures largely misconstrue the current relevance of Hong Kong's TCI, as they fail to recognize its unique role in producing and sourcing globally from an open and relatively undistorted economy. By drawing on inputs at world market prices or producing elsewhere when new locational advantages (be they due to changes in economic policies or the availability of T&C export quotas to industrialized countries) were perceived as being spawned, the Hong Kong TCI has developed large human capital and service sector capacities. This has allowed it to flexibly and efficiently act and react globally. That it still can play in the big league is attested to by the fact that it is still the world's third largest exporter of clothing products (behind China and Italy).

We have seen above what happens when the rest of the ATC quotas are removed, in the real world by the year 2005. But what will happen when accordingly the rents from these quotas in Hong Kong (assuming they currently do remain there), as well as from those in other countries around Asia in which Hong Kong firms have production facilities or source T&C products, disappear? Or rather, what happens to changes in trade flows and welfare if quota rents in this age of Walmarts et al are already being pocketed by the importers and not the exporters?

But no doubt even more important, what will China's accession to the WTO mean for Hong Kong's T&C industry? After all, it is estimated that over 50% of China's clothing exports today (which account for 17% of world trade in clothing products) are directly or indirectly due to the involvement of Hong Kong companies. We have seen how large the shift of demand to China might be. But which countries will be most affected? To what degree and how will the Hong Kong economy be affected? And finally, what might be the ramifications of applying the above mentioned surge clauses, built into China's WTO protocol of accession as a result of the US-China bilateral agreement?

The empirical results of the model are best appreciated knowing how Hong Kong's T&C industries have been tracking in recent years.

- Hong Kong's *textile industry* has been underperforming – by 1998 domestic exports were almost 40% below their peak in 1991 and their share in world markets had fallen nearly 50% since their highest levels in the early 80's. Given the fact that the unit values of textile exports have probably increased more rapidly than most other countries over time, in volume terms the decline of exports is no doubt all the larger. As can be seen in Table Overview III.2 Hong Kong was the only major Asian exporter to exhibit negative growth rates throughout the 90's. Other countries, like Sri Lanka, India and Malaysia all expanded over the eight year period. With a tight labor market and property prices reaching their highest levels around the mid 90's, alternative sites for capital and land-intensive textile production were sought outside of Hong Kong. Such moves were further induced by the simple fact that clothing production had been migrating out of Hong Kong as well.
- As far as Hong Kong's *clothing industry* is concerned, while it has held third place among all the clothing exporting countries throughout this decade, its growth rates were less than half of the average over the last 15 years and but one tenth the average over the decade of the 90's (see Overview III.2). As compared with its Asian competitors its performance reflects a similar trend as in those countries (e.g. Japan, Korea and Taiwan) growing out of the labor-intensive industries so important at the initial stage of development. But the table does injustice to the Hong Kong CI as it neither reveals how much Hong Kong companies are actually involved in other Asian countries nor how large the export service content of the TCI industry in Hong Kong is. Putting the Asian CI in a more global perspective it can be seen – focusing on the total share of exports from Asia in world trade (second to last line) – that the share in 1998 as opposed to 1990 was two percentage points lower. While this could well reflect the impact of the Asian crisis, it probably even more so reflects the shifts away from Asia and into locations on the rim of the EU or south of the USA. But here again it may well also be a question of quotas – if they are not available in Asia then it is back to the countries next door, like Mexico and Turkey. In the case of Mexico no country has grown so fast in the last 15 years – overall it grew almost 200% faster than average and over 70% faster than China.

The results of the model calculations can be found summarized as follows (see Tables 18-23 and Diagrams 3 and 4, whereby emphasis is placed on exports):

- Aside from the sizeable increases in textile exports registered by China (PRC) and Chinese Taipei, Japan and Bangladesh (and other South Asia) exhibit similar results. Virtually all other economies experience losses, with the largest decrease

shown by Mexico. In the latter case, the loss of preferential treatment because of the elimination of quotas severely affects Mexico and to a lesser degree Turkey.

- In the case of clothing exports, the massive shift to Chinese sources (+167.84%) is overshadowed by an even larger increase in India's exports (+217.51%). India's increase – which comes onto to a level of exports roughly one seven the size of China's (PRC) – can be explained to some extent by the highly restrictive quotas (see col. 1 in Table 23) which prevailed on top of a large domestic industry which could begin to tap into the global potential. However, while India has almost always been viewed as having an export potential in numerous areas, its internal policies have usually kept it from being successful. Among all other economies, only Vietnam shows that it too can profit from the ATC liberalization.

Overview III.2 —Textile^a/Clothing^b Exports of Asian Countries 1990–99 (Shares^c/Rankings^d/Growth Rates^e)

	1990		1994		1999		Growth rates ^f		
							1990-94	1994-99	1990-99
Textiles and Clothing									
China	7.91	(3)	13.13	(1)	12.91	(1)	20.46	3.94	10.98
Korea Rep.	6.54	(4)	6.04	(4)	4.94	(5)	4.03	0.17	1.87
Taiwan	4.74	(7)	5.06	(5)	4.15	(6)	7.89	0.24	3.57
Hong Kong	5.36	(5)	4.21	(7)	3.23	(9)	-0.08	-1.09	-0.64
India	2.21	(15)	2.78	(11)	2.85	(12)	12.45	4.81	8.14
Japan	3.01	(11)	2.72	(12)	2.11	(14)	3.46	-0.87	1.03
Indonesia	1.35	(20)	2.11	(15)	2.06	(15)	18.56	3.81	10.12
Pakistan	1.72	(17)	2.06	(16)	1.94	(17)	10.91	3.06	6.48
Thailand	1.75	(16)	2.27	(14)	1.58	(18)	13.23	-3.08	3.86
Bangladesh	0.42	(38)	0.67	(29)	1.36	(21)	19.57	20.10	19.86
Malaysia	0.78	(24)	1.07	(20)	1.01	(23)	15.02	3.05	8.21
Philippines	0.87	(23)	0.89	(24)	0.71	(24)	6.56	-0.15	2.78
Sri Lanka	0.31	(43)	0.59	(32)	0.75	(30)	24.77	9.18	15.85
Macau	0.58	(27)	0.50	(34)	0.56	(34)	2.25	6.39	4.53
Mauritius	0.30	(44)	0.29	(45)	0.32	(39)	5.58	6.22	5.93
Singapore	0.53	(30)	0.34	(41)	0.22	(49)	-5.01	-4.99	-4.94
Total ^g	38.39		44.75		40.70		10.27	2.33	5.79
World^h	213.41		270.65		333.95		5.12	4.29	5.10
Textiles									
China	6.87	(3)	9.07	(2)	8.82	(1)	13.11	1.99	6.79
Korea Rep.	5.78	(6)	8.21	(4)	7.85	(4)	15.18	1.67	7.47
Taiwan	5.83	(5)	7.88	(5)	7.43	(5)	13.75	1.38	6.70
Japan	5.58	(8)	5.21	(7)	4.46	(9)	3.72	-0.56	1.32
India	2.08	(14)	2.94	(12)	3.18	(10)	15.12	4.18	8.91
Pakistan	2.54	(12)	3.06	(11)	3.05	(11)	10.60	2.52	6.03
Indonesia	1.18	(20)	1.92	(14)	2.04	(16)	19.11	3.96	10.38
Thailand	0.88	(21)	1.26	(20)	1.23	(19)	15.42	1.97	7.74
Hong Kong	2.07	(15)	1.49	(18)	0.83	(23)	-2.70	-8.87	-6.18
Malaysia	0.33	(30)	0.64	(25)	0.76	(24)	24.76	6.15	14.05
Bangladesh	0.29	(31)	0.28	(34)	0.33	(30)	4.38	6.46	5.53
Philippines	0.13	(48)	0.17	(42)	0.19	(42)	13.62	4.64	8.54
Singapore	0.13	(44)	0.19	(41)	0.17	(45)	15.16	0.08	6.52
Macau	0.13	(45)	0.12	(47)	0.15	(47)	3.98	7.48	5.91
Sri Lanka	0.02	(56)	0.10	(54)	0.14	(49)	51.87	9.14	26.41
Mauritius	0.01	(58)	0.04	(58)	0.10	(52)	44.97	23.13	32.40
Total ^g	33.85		42.58		40.73		11.75	1.67	6.03
World^h	105.04		130.24		147.92		5.52	2.58	3.98
Clothing									
China	8.92	(2)	16.90	(1)	16.17	(1)	25.18	4.95	13.45
Hong Kong	8.55	(3)	6.74	(3)	5.14	(3)	0.50	0.24	0.36
Korea Rep.	7.27	(5)	4.03	(5)	2.62	(9)	-7.97	-2.93	-5.20
India	2.33	(13)	2.64	(11)	2.61	(10)	9.98	5.45	7.44
Bangladesh	0.54	(35)	1.04	(26)	2.18	(12)	25.62	22.69	23.98
Indonesia	1.52	(18)	2.28	(14)	2.07	(14)	18.14	3.77	9.92
Thailand	2.60	(11)	3.21	(9)	1.85	(15)	12.47	-5.21	2.27
Taiwan	3.68	(7)	2.45	(12)	1.55	(17)	-3.59	-3.50	-3.54
Sri Lanka	0.59	(31)	1.05	(25)	1.23	(21)	23.29	9.18	15.24
Malaysia	1.21	(19)	1.47	(18)	1.21	(22)	12.02	1.70	6.17
Philippines	1.60	(16)	1.56	(16)	1.13	(24)	5.97	0.69	2.22
Pakistan	0.94	(23)	1.12	(23)	1.05	(26)	11.69	4.40	7.58
Macau	1.03	(22)	0.86	(27)	0.88	(30)	2.03	6.25	4.35
Mauritius	0.57	(32)	0.52	(35)	0.49	(34)	4.25	4.48	4.37
Singapore	0.92	(24)	0.48	(37)	0.25	(45)	-9.18	-7.00	-7.97
Japan	0.52	(36)	0.41	(42)	0.24	(46)	0.70	-4.80	-2.39
Total ^g	42.79		46.76		40.67		9.09	2.97	5.64
World^h	108.37		140.41		186.83		6.69	5.79	6.24

^aSITC 65, Rev. 2. – ^bSITC 84, Rev. 2. – ^cAverage annual growth rate (%) ^eShare of world trade. – ^dRanking based on values in 1999; covering all available Asian textile and clothing exporting countries; country selection for the table dictated by top 16 Asian countries exporting T&C products in 1999; ranking in given year in () refers to ranking in world. – ^eAverage annual growth rate. – ^fBold typed numbers designate an above world average growth rate. – ^gSum of shares of listed countries. – ^hIn bill. US\$.

Source: Own calculations based on UNCTAD tabulations and WTO, Annual Report 2000 (2000: Tab. IV.73 and IV.81)

To put the above changes into proper perspective: alone the increase in clothing exports estimated for China (PRC) would amount to over 25% of total world trade in clothing products in the base year. Given such massive changes the question must be asked whether China (PRC) will be able to accommodate them. In this connection one must recall that numerous other industries in China (PRC) suffered relatively large decreases in output in the course of applying the WTO accession conditions. These highly inefficient industries will help provide the workforce for the newly operating textile and clothing companies. Nonetheless, it does seem to be worthwhile keeping in mind that a rush to the Middle Kingdom, for sure not a rush to the bottom, is something which would be expected to take place over a period of up to 7 years. And in 7 year's time the necessary adjustments would seem to be doable.

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Technical Annex A: An Overview of the Computational Model

A. INTRODUCTION

This appendix provides an overview of the basic structure of the global CGE model employed for assessment of Greater China accession to the WTO. The model is a standard multi-region computable general equilibrium (CGE) model. The reader is referred to Hertel (1996: <http://www.agecon.purdue.edu/gtap/model/Chap2.pdf>) for a detailed discussion of the basic algebraic model structure represented by the GEMPACK code. The capital accumulation mechanisms are described in Francois et al. (1996: <http://www.agecon.purdue.edu/gtap/techpaper/tp-7.htm>). The model is implemented in GEMPACK – a software package designed for solving large applied general equilibrium models. The model is solved as an explicit non-linear system of equations, through techniques described by Harrison and Pearson (1994). More information can be obtained at the following URL – <http://www.monash.edu.au/policy/gempack.htm>. Social accounting data are based on Version 5 of the GTAP dataset (GTAP 2001), with an update to reflect post-Uruguay Round protection as discussed in the body of the report. The full set of model files are available upon request.

The national accounts data have been organized to 23 sectors and 25 regions. (Note that we have included some detail on the value added chain linking fibers into textiles and clothing production, to better capture the initial impact of the ATC on our base scenario.) The sectors and regions for this 23x25 aggregation of the data are detailed in A.1 below.

The data come from a number of sources. Data on production and trade are based on national accounting data linked through trade flows and drawn directly from the Global Trade Analysis Project (GTAP) version 5 dataset. (GTAP 2001). (See Reinert and Roland-Holst 1997 for a discussion of the organization of such data for CGE models). The GTAP version 5 dataset is benchmarked to 1997, and includes detailed national input-output, trade, and final demand structures. Significant modifications have been made to the basic GTAP database. The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers. We have updated the dataset to better reflect actual import protection for goods and services. (The basic GTAP database includes no information at all on trade barriers for services).

B. GENERAL STRUCTURE

The general conceptual structure of a regional economy in the model is represented in Figure A.1. Within each region, firms produce output, employing land, labour, and capital, and combining these with intermediate inputs. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labour (both skilled and unskilled) are mobile between all production sectors. Capital is fully mobile within regions. However, capital movements between regions are not modeled, but rather are held fixed in all simulations. Labour mobility is discussed below.

All demand sources combine imports with domestic goods to produce a composite good, as indicated in Appendix Figure A.1. In constant returns sectors, these are Armington composites. In increasing returns sectors, these are composites of firm-differentiated goods. Trade elasticities are also presented in Appendix Table 2.

C. DYNAMICS

An important feature of the model involves a dynamic link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, including Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of the Uruguay Round have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. In the present application, we work with a classical savings-investment mechanism (discussed briefly in the appendix, and also in Francois et al 1997). This means we model medium- to long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

D. TAXES AND POLICY VARIABLES

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modeled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

Trade policy instruments are represented as import or export taxes/subsidies. This includes applied most-favored nation (mfn) tariffs, antidumping duties, countervailing duties, price undertakings, export quotas, and other trade restrictions. The one exception is service-sector trading costs, which are discussed in the next section.

Basic data on current tariff rates come from the UNCTAD and WTO data on applied and bound tariff rates. These are integrated into the core GTAP database. These are supplemented with data from USTR and USITC on regional preference schemes in the Western Hemisphere. For agriculture, protection is based on OECD and USDA estimates of agricultural protection, as integrated into the GTAP core database. Tariff and non-tariff barrier estimates are further adjusted to reflect remaining Uruguay Round commitments, including the phase-out of remaining textile and clothing quotas under the Agreement on Textiles and Clothing (the ATC). Data on post-Uruguay Round tariffs are taken from recent estimates reported by Francois and Strutt (1999). These are taken primarily from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules. All of this tariff information has been concorded to our model sectors. Services trade barriers are based on the estimates described below.

E. TRADE AND TRANSPORTATION COSTS

International trade is modeled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the composite "international trade

services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported in version 4 of the GTAP dataset.

A second form of trade costs is known in the literature as frictional trading costs. These are implemented in the service sector. They represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. Conceptually, we have implemented a linear transformation technology between domestic and export services. This technology is represented in Appendix Figure A.2. The straight line AB indicates, given the resources necessary to produce a unit of services for the domestic market, the feasible amount that can instead be produced for export using those same resources. If there are not frictional barriers to trade in services, this line has slope -1. This free-trade case is represented by the line AC. As we reduce trading costs, the linear transformation line converges on the free trade line, as indicated in the figure.

F. PRODUCTION STRUCTURE

The basic structure of production is depicted in Appendix Figure A.3. Intermediate inputs are combined, and this composite intermediate is in turn combined in fixed proportions with value added. This yields sectoral output Z. The value-added substitution elasticities (between capital and labor) are presented in Appendix Table A.1.

G. THE COMPOSITE HOUSEHOLD AND FINAL DEMAND STRUCTURE

Final demand is determined by an upper-tier Cobb-Douglas preference function, which allocates income in fixed shares to current consumption, investment, and government services. This yields a fixed savings rate. Government services are produced by a Leontief technology, with household/government transfers being endogenous. The lower-tier nest for current consumption is also specified as a Cobb-Douglas. The regional capital markets adjust so that changes in savings match changes in regional investment expenditures. (Note that the Cobb-Douglas demand function is a special case of the CDE demand function employed in the model code. It is implemented through GEMPACK parameter files.)

H. LABOUR MARKETS

Our default closure involves modeling labour markets as clearing with flexible wages. However, in implementation the mobility of labour between sectors is slightly "sluggish" in the sense that there is not a perfectly linear transform technology for movement of labour between sectors. This represents the assumption that for institutional reasons (and because some skills are sector specific), labour is not fully flexible in its application across sectors. We view this as a reasonable representation of labour markets. To the extent that wage rigidities are important, the direction of aggregate employment effects may be inferred from wage effects. (Hertel 1996 refers to this as "sluggish" factor movements). Theoretical discussion of factor mobility, along the lines developed in Hertel and employed here, can be found in Casas (1984). It should be noted that in practice the transformation elasticities are set very high (-25.0) but not infinitely so. This effectively allows for "essentially" full mobility. (It also speeds up finding numeric solutions without changing the substantive results.) Values for these parameters can be found in Appendix Table A.1, which provides a summary of several relevant elasticities.

I. SERVICES BARRIERS

The basic methodology involves the estimation of sector-specific gravity equations vis-à-vis global trade levels. Basically, we take GTAP bilateral trade data, and fit it to a simple gravity model of total imports by country. In this case, these equations have been estimated at the level of aggregation corresponding to the model sectors.

The gravity equations are estimated using ordinary least squares with the following variables:

$$(1) \quad X_i = a_1 \cdot \ln(POP_i) + a_2 \cdot \ln(PCGDP)_i + a_3 \cdot \ln(PCGDP)_i^2 + e_i$$

where X_i represents imports from the world, POP represents population, and $PCGDP$ per-capita income in the importing country.

In the regressions, we break out Hong Kong as a free trade "benchmark" in the regressions. Deviations from predicted imports, relative to this free trade benchmark, are taken as an indication of barriers to trade. These tariff equivalent rates are then backed out from a constant elasticity import demand function as follows:

$$(2) \quad \frac{T_1}{T_0} = \left[\frac{M_1}{M_0} \right]^{\frac{1}{e}}$$

Here, T_I is the power of the tariff equivalent $(1+t_I)$ such that in free trade $T_0=1$, and $[M_I/M_0]$ is the ratio of actual to predicted imports (normalized relative to the free trade benchmark ratio for Hong Kong, as discussed above). This is a reduced form, where actual prices and constant terms drop out because we take ratios. The term e is the demand elasticity (with values as suggested by the relevant trade substitution elasticities in Table A.2).

Relevant estimates of tariff equivalents for the model sectors and regions are reported in Table A.3.

Table A.1: The Sectoring Scheme of the Model

Model Regions		Model Sectors	
<i>abbreviations</i>	<i>description</i>	<i>abbreviations</i>	<i>description</i>
Australia	Australia	Wool	Wool
NewZealand	New Zealand	NatFibers	Natural fibers (cotton etc.)
China	Mainland China	PrimFood	Primary food production
HongKong	Hong Kong	OthPrimary	Other primary production
Japan	Japan	Sugar	Sugar
Korea	Korea	ProcFood	Processed food, tobacco, and beverages
Taiwan	Chinese Taipei (Taiwan)	Textiles	Textiles
ASEAN5	ASEAN5 member states ^a	Clothing	Wearing apparel
Vietnam	Vietnam	Leather	Leather products
Bangladesh	Bangladesh	ChemRef	Chemicals, refinery products, rubber, plastics
India	India	Steel	Steel refinery products
SouthAsia	South Asia	Nfmetals	Non-ferrous metal products
Canada	Canada	MotorVehs	Motor vehicles and parts
Mexico	Mexico	Electronics	Electronic machinery and equipment
USA	United States of America	OthrMach	Other machinery and equipment
CBI	Caribbean Basin Initiative countries	MnfcNEC	Other manufactured goods
ATP	Andean Trade Pact countries	Trade	Wholesale and retail trade services
Brazil	Brazil	Transport	Transportation services (land, water, air)
MERCOSUR	MERCOSUR ^b	Communic	Communications services
Chile	Chile	Construction	Construction
OtherLatAm	Other Latin America	FIRE	Finance, insurance, and real estate services
EuropUnion	European Union	CommServ	Other commercial services
Turkey	Turkey	OtherServ	Other services (public, health, etc.)
AfricaME	Africa and the Middle East		
ROW	Rest of World		

^a ASEAN5 includes Phillipines, Thailand, Indonesia, Singapore, and Malaysia

^b MERCOSUR includes Argentina, Paraguay, Uruguay. Brazil is represented separately

Table A.2: Model Parameters

<i><u>description</u></i>	elasticity of substitution in value added	Armington elasticity
Wool	0.24	4.4
Natural fibers (cotton etc.)	0.24	4.4
Primary food production	0.23	4.61
Other primary production	0.2	5.6
Sugar	0.63	4.4
Processed food, tobacco, and beverages	1.12	4.72
Textiles	1.26	4.4
Wearing apparel	1.26	8.8
Leather products	1.26	8.8
Chemicals, refinery products, rubber, plastics	1.26	3.8
Steel refinery products	1.26	5.6
Non-ferrous metal products	1.26	5.6
Motor vehicles and parts	1.26	10.4
Electronic machinery and equipment	1.26	5.6
Other machinery and equipment	1.26	6.25
Other manufactured goods	1.26	5.16
Wholesale and retail trade services	1.68	3.8
Transportation services (land, water, air)	1.68	3.8
Communications services	1.26	3.8
Construction	1.4	3.8
Finance, insurance, and real estate services	1.26	3.8
Other commercial services	1.26	3.8
Other services (public, health, etc.)	1.26	4.06

Table A.3: Pre- and Post-Accession Protection by Sector (tariff or tariff equivalent)

	<i>Mainland China</i>			<i>Chinese Taipei</i>		
merchandise	GTAP base rates	Accession rates	New bound rates	GTAP base rates	Accession rates	New bound rates
Wool	14.76	42.00	38.00	0.00	0.00	0.00
Natural fibers (cotton etc.)	3.14	17.38	13.58	0.00	6.02	4.88
Primary food production	58.80	58.13	46.83	8.48	1.49	1.42
Other primary production	0.48	6.94	5.08	4.72	1.85	1.62
Sugar	29.49	30.00	20.00	22.05	14.00	14.00
Processed food, tobacco, and beverages	37.65	40.66	23.18	26.17	8.19	6.67
Textiles	25.09	25.43	10.21	6.13	2.58	2.28
Wearing apparel	31.75	32.80	16.05	12.80	4.84	4.22
Leather products	12.10	20.94	17.02	3.99	1.50	1.31
Chemicals, refinery products, rubber, plastics	12.62	14.85	7.17	3.75	1.92	1.43
Steel refinery products	9.68	8.92	5.10	5.12	1.79	0.16
Non-ferrous metal products	7.83	8.20	5.52	1.70	1.28	0.68
Motor vehicles and parts	34.42	38.65	15.41	23.89	10.65	5.47
Electronic machinery and equipment	11.93	16.90	9.62	2.93	3.29	2.07
Other machinery and equipment	12.83	15.37	10.14	4.57	1.92	1.26
Other manufactured goods	14.51	21.99	16.29	4.94	2.01	1.49
services	Base Protection		New Protection	Base Protection		New Protection
Wholesale and retail trade services	0.00	*	0.00	0.00	*	0.00
Transportation services (land, water, air)	3.97	*	1.99	3.38	*	1.69
Communications services	9.18	*	4.59	4.41	*	2.21
Construction	13.68	*	6.84	11.76	*	5.88
Finance, insurance, and real estate services	8.08	*	4.04	3.71	*	1.86
Other commercial services	47.92	*	23.96	8.37	*	4.19
Other services (public, health, etc.)	25.74	*	12.87	14.17	*	7.09

Figure A.1 — Armington Aggregation Nest

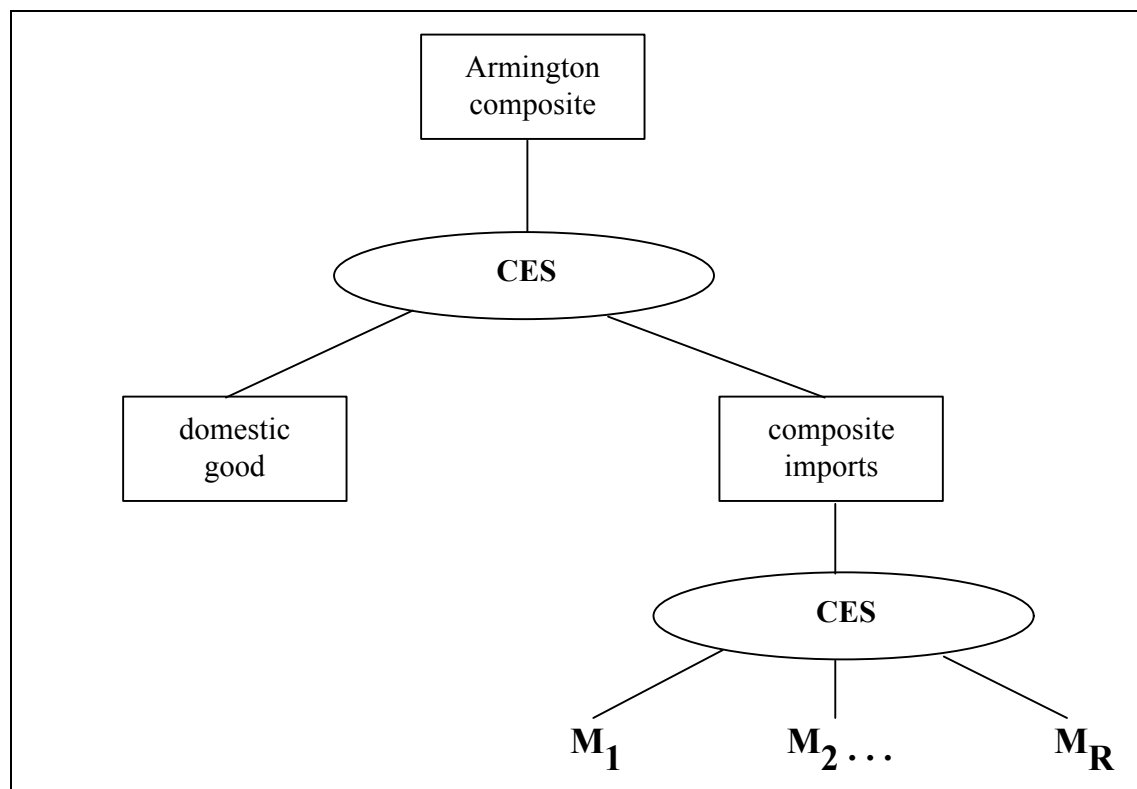


Figure A.2 -- Trading Costs in the Service Sector

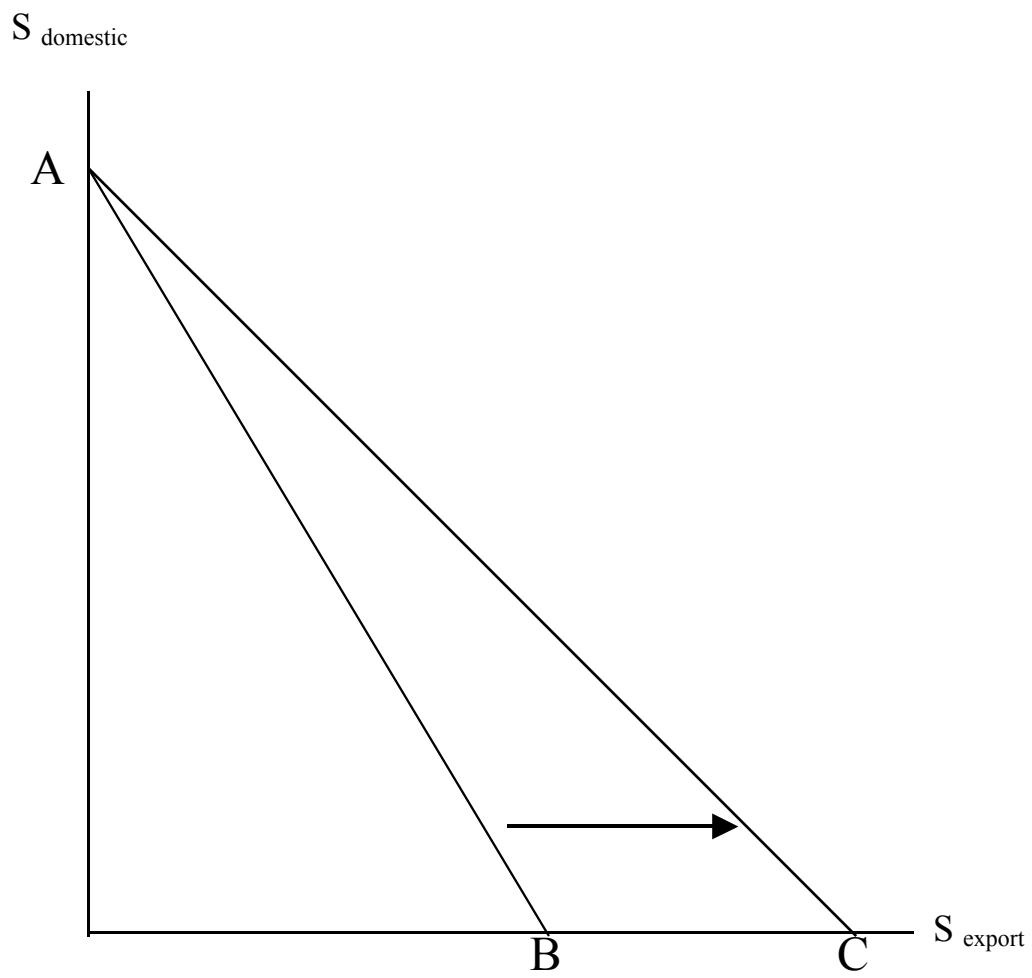


Figure A.3 — Basic Features of the Simulation Model

