

WORKING PAPER SERIES

**IMPACT OF CHINA'S TRADE AND
FOREIGN INVESTMENT REFORMS
ON THE WORLD ECONOMY**

*Working Paper Number 17
October 1997*



Industrie Canada Industry Canada

WORKING PAPER SERIES

**IMPACT OF CHINA'S TRADE AND
FOREIGN INVESTMENT REFORMS
ON THE WORLD ECONOMY**

by Winnie Lam, Industry Canada

*Working Paper Number 17
October 1997*

Aussi disponible en français

Canadian Cataloguing in Publication Data

Lam, Winnie

Impact of China's Trade and Foreign Investment Reforms
on the World Economy

(Working Paper; number 17)

Text in English and French on inverted pages.

Title on added t.p.: Incidence sur l'économie mondiale
des réformes en matière d'investissement étranger et
de commerce mises en oeuvre en Chine.

Includes bibliographical references.

ISBN 0-662-63184-6

No de cat. C21-24/17-1997

1. China -- Commerce.
 2. China -- Commercial policy.
 3. Investments, foreign -- China.
 4. China -- Foreign economic relations.
 5. Canada -- Commerce -- China.
- I. Canada. Industry Canada
II. Series: Working paper (Canada. Industry Canada).

HC426.92I46 1997

382'.0951

C97-980382-9E

The views expressed in this working paper do not necessarily reflect those of Industry Canada or of the federal government.

The list of titles available in the *Research Publications Program* and details on how to obtain copies can be found at the end of this document. Abstracts of industry Canada research volumes as well as abstracts and full text of working papers, occasional papers, discussion papers and our quarterly newsletter, *MICRO*, can be accessed via *STRATEGIS*, the Department's online business information site, at <http://strategis.ic.gc.ca>.

Comments should be addressed to:

Someshwar Rao
Director, Strategic Investment Analysis
Micro-Economic Policy Analysis
Industry Canada
235 Queen Street, 5th Floor, West Tower
Ottawa (Ontario)
K1A 0H5
Tel: (613) 941-8187
Fax: (613) 991-1261
E-mail: Rao.Someshwar@ic.gc.ca

TABLE DES MATIÈRES

SOMMAIRE	i
1. INTRODUCTION	1
2. ÉVOLUTION DU SECTEUR EXTÉRIEUR DE LA CHINE ET SES RÉPERCUSSIONS SUR LE CANADA, L'ASIE ET D'AUTRES ÉCONOMIES ..	7
Importance accrue du commerce et de l'investissement étranger direct en Chine	7
Compétitivité changeante sur le plan de l'exportation en Chine	10
Relations changeantes en matière de commerce et d'investissement interrégional bilatéral	13
3. PORTÉE DES RESTRICTIONS EN MATIÈRE DE COMMERCE ET D'INVESTISSEMENT ÉTRANGER IMPOSÉES PAR LA CHINE	27
Portée des restrictions au commerce imposées par la Chine au milieu des années 1980	27
Restrictions au commerce imposées en Chine et distorsions des prix sur les exportations canadiennes au début des années 1990	32
Portée des restrictions à l'investissement étranger au milieu des années 1980 ..	35
4. INCIDENCE DES RÉFORMES EN MATIÈRE D'INVESTISSEMENT ÉTRANGER ET DE COMMERCE MISES EN OEUVRE EN CHINE	39
Effets de bien-être : Réformes en matière d'investissement étranger et de commerce mises en oeuvre en Chine	42
Effets de la réforme en matière de commerce mise en oeuvre en Chine sur la structure du commerce mondial	52
Résumé	57
5. CONCLUSIONS	59
ANNEXE 3.A	
ÉVALUATION DE LA PORTÉE DES RESTRICTIONS AU COMMERCE IMPOSÉES EN CHINE AU MILIEU DES ANNÉES 1980	63
ANNEXE 3.B	
RESTRICTIONS AU COMMERCE IMPOSÉES EN CHINE ET DISTORSIONS DES PRIX SUR DES GROUPES DE PRODUITS CHOISIS QUI TOUCHENT LE CANADA (DÉBUT DES ANNÉES 1990)	73
ANNEXE 4.A	
MODÈLE D'ÉQUILIBRE GÉNÉRAL APPLIQUÉ À PLUSIEURS PAYS	75

ANNEXE 4.B

**EXPLICATION DE L'EFFET DE BIEN-ÊTRE NÉGATIF SUR LE JAPON
DÉCOULANT DE L'ABOLITION DES RESTRICTIONS À
L'INVESTISSEMENT ÉTRANGER IMPOSÉES EN CHINE**

(EXPÉRIENCE B) 87

BIBLIOGRAPHIE 89

PUBLICATIONS DE RECHERCHE D'INDUSTRIE CANADA 93

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1. INTRODUCTION	1
2. CHINA'S EVOLVING EXTERNAL SECTOR AND ITS IMPLICATIONS FOR CANADA, ASIA AND OTHER ECONOMIES	7
Increased Significance of Trade and Foreign Direct Investment in China	7
Changing Export Competitiveness in China	9
Changing Bilateral Inter-regional Trade and Investment Relationships	13
3. THE EXTENT OF CHINA'S TRADE AND FOREIGN INVESTMENT RESTRICTIONS	25
Extent of China's Trade Restrictions: mid-1980s	25
China's Trade Restrictions and Price Distortions on Canadian Exports: early 1990s	29
Extent of Foreign Investment Restrictions: mid-1980s	32
4. THE IMPACT OF CHINA'S TRADE AND FOREIGN INVESTMENT REFORMS	35
Welfare Effects: China's Trade and Foreign Investment Reforms	36
Effects of China's Trade Reform on the Global Trade Structure	46
Summary	49
5. CONCLUSIONS	51
APPENDIX 3.A ESTIMATING THE EXTENT OF CHINA'S TRADE RESTRICTIONS IN THE MID 1980S	53
APPENDIX 3.B CHINA'S TRADE RESTRICTIONS AND PRICE DISTORTIONS ON SELECTED PRODUCT GROUPS THAT AFFECT CANADA (EARLY 1990S) .	61
APPENDIX 4.A A MULTI-COUNTRY APPLIED GENERAL EQUILIBRIUM MODEL	63

APPENDIX 4.B	
EXPLANATION FOR THE NEGATIVE WELFARE EFFECT INDICATED FOR JAPAN WITH THE ABOLITION OF CHINA'S FOREIGN INVESTMENT RESTRICTIONS (EXPERIMENT B)	75
BIBLIOGRAPHY	77
INDUSTRY CANADA RESEARCH PUBLICATIONS	81

LIST OF FIGURES

Figure 1.1	Region's Share in APEC Population, 1995	2
Figure 1.2	China's Total Exports and Imports, 1980-1994	4
Figure 2.1	China's Trade and Stock of Foreign Investment as % of its GDP	7
Figure 2.2	Evolution of China's Revealed Comparative Advantage, Broad Manufactured Products, 1979/80 and 1989/90	10
Figure 2.3	China's Share of World Exports in Selected Manufacturing Products, 1985-1990	11
Figure 2.4	China's and Canada's Revealed Comparative Advantage, Selected Industries 1989/90	14
Figure 2.5	RCA of Unskilled Labour-Intensive Goods for Selected Asia-Pacific Countries, 1980-1992	15
Figure 2.6	Distribution of China's Exports by Region, 1980-1993 (unadjusted for re-exports through Hong Kong)	16
Figure 2.7	Distribution of China's Exports by Region, 1990 (adjusted for re-exports through Hong Kong)	17
Figure 2.8	Distribution of China's Imports by Region, 1980-1993 (unadjusted for reexports through Hong Kong)	19
Figure 2.9	Distribution of Inward Foreign Investment Stock into China, by Region, 1980 and 1993	20
Figure 2.10	Distribution of Outward Foreign Investment Stock from China by Region, 1980 and 1993	21
Figure 2.11	Share of Canada's Top Four Commodity Exports to China (1991-1995) - at 6-Digit HS Classification Code	23
Figure 3.1	Sectoral Import Restriction Indicator in China (mid-1980s)	26
Figure 3.2	Sectoral Export Restriction Indicator in China (mid-1980s)	27
Figure 3.3	China's and Other Regions' Rates of Return (mid-1980s)	34
Figure 4.1	Welfare Effects of China's Trade Reform, Foreign Investment Reform, and Trade and Foreign Investment Reforms	38
Figure 4.2	Terms of Trade Effects of China's Trade Reform, Foreign Investment Reform, and Trade and Foreign Investment Reforms	39
Figure 4.3	Global Efficiency Gains from China's Trade Reform, Foreign Investment Reform, and Trade and Foreign Investment Reforms	41
Figure 4.4	Changes in the Rates of Return after China's Foreign Investment Reform, and Trade and Foreign Investment Reforms	42
Figure 4.5	Capital Service Inflows to China after China's Foreign Investment Reform, and Trade and Foreign Investment Reforms	43
Figure 4.6	Regional Capital Service Outflows to China after China's Foreign Investment Reform, and Trade and Foreign Investment Reforms	44
Figure A4.1	Production Structure in each sector	65
Figure A4.2	Nesting Structure used in Household Utility Functions	69

LIST OF TABLES

Table 1.1	Gross Domestic Product in China, APEC and Selected Economies — 1994	3
Table 2.1	China's Merchandise Trade, 1980-1994	7
Table 2.2	China's Foreign Direct Investment Stock, 1980-1993	8
Table 3.1	Matching of Commodity Classification in the model with UN SITC Classification Codes	29
Table 3.2	China's Trade Restrictions and Price Distortions on Selected Products that Affect Canada (early 1990s)	31
Table 4.1	Regional Classification in the Model	36
Table 4.2	Changes in Sectoral Trade Patterns arising from China's Trade Reform Alone (Experiment A)	47
Table A3.1	Determination of the Price Wedges between China's Domestic Market Prices and International Prices in China's Export Sectors in the mid-1980s	55
Table A3.2	Determination of the Price Wedges between China's Domestic Market Prices and International Prices in China's Import Sectors in the mid-1980s	58

EXECUTIVE SUMMARY

China's population is huge, encompassing over one-fifth of the world population in 1995. The country is the fastest growing economy in the world with a double-digit average annual real growth rate of 11% between 1980-1994. In 1995, China was the world's 11th largest trading nation. China was also the second largest recipient of foreign direct investment among all the APEC economies in 1992, taking up 6.8% of the world's total.

The re-entrance of China into the international trading arena invites many trading and investment opportunities for other countries, especially with per capita income in China still at a low level of US\$451 in 1994. Canada and other countries are expected to gain directly from increased trade and investment relationships with China, and indirectly through the spillover effects that other economies might benefit. Less-developed countries and other former command economies can also learn from China's experience as they undertake reforms in their own foreign sector.

The significance of China's opening up to the global trading system warrants an in-depth empirical analysis. To achieve this objective, this study closely examines the hypothetical scenario in which China TOTALLY removes all its trade and foreign investment restrictions. The implications for China as well as for other trading nations are investigated using the computational general equilibrium technique. A secondary objective is to provide some perspective on the current evolving state of the Chinese external sector and its significance for Canada, Asia, and other economies. Following are some of the major findings of this study:

- For ALL regions, the results of the model used strongly suggest a positive complementary effect between China's trade reform and foreign investment reform. Though the model shows that EVERY region benefits from China's trade reform and foreign investment reform, it further indicates that gains augment substantially for ALL regions if China simultaneously implements both reforms.
- Though the potential of expanding trading opportunities between Canada and China can be enormous, at the moment China's import restrictions and price controls are still inhibiting many major and potential exports from Canada to China. To a certain extent, Canada's import restrictions in labour-intensive goods (e.g., clothing, fabrics, and footwear) are restraining China's exports to Canada in these areas.
- China's trade and investment ties with the U.S. and especially with Hong Kong in Asia have significantly strengthened. Canada is expected to benefit from the indirect effects of gains made by U.S. and Asian economies through China's foreign sector reforms.

In policy terms, the findings strongly support the complete removal of China's trade barriers, both for the sake of China and for other economies, including Canada. More significantly, the model results point to the importance of implementing a comprehensive reform package in China. China's trade and foreign investment reforms complement each other positively in the fact that welfare gains increase significantly for ALL regions when China performs both reforms jointly rather than separately. Lastly, it is hoped that China's successful experience can provide some optimism for less-developed countries and former command economies as they embark on their own foreign sector reforms.

1. INTRODUCTION

China's population stands at 1.2 billion in 1995. This figure amounts to 21% of the world population or slightly over 55% of the entire Asia Pacific Economic Cooperation (APEC) region (Figure 1.1). The country's average annual real growth rate was 11% between 1980-1994, surpassing even the four Asian tigers and the Association of Southeast Asian Nations (ASEAN) (Table 1.1). The opening of the Chinese economy to the international trading arena becomes a pertinent subject on both the domestic and international front. China has captured the attention of its Asian neighbouring countries as well as every other nation in the world. Within a short span of less than two decades, China has evolved from an almost closed economy into one in which foreign trade and foreign investments have played dominant roles.

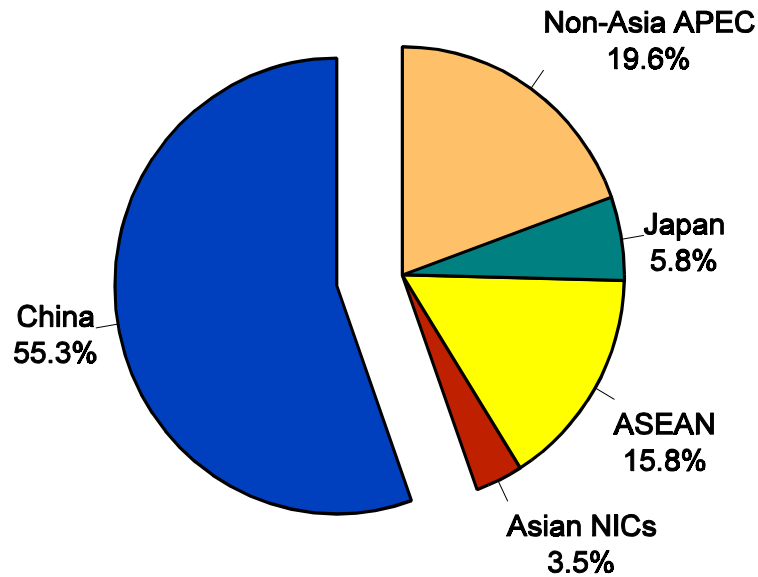
Merchandise trade as a percent of China's GDP rose from 12.4% in 1980 to 50.0% in 1994. In this respect, China has become a more open economy than the United States (at 16.7%) or even the APEC economies (at 24.3%) in 1994. Total exports from China multiplied by 6.2 between 1980 and 1994, at US\$120 billion in 1994. China's increase in total imports is equally impressive, rising by 6.9 times to US\$140 billion in 1994 (Figure 1.2).

Among the APEC economies, China was the second largest recipient of foreign direct investment in 1992, taking up 6.8% of the world's total. This figure is slightly smaller than the United States, which took up 7.0% of the world's total in the same year. Many trade and investment opportunities abound in China's dynamic and enormous economy, especially when the country's per capita income remains at a low level of US\$451¹ in 1994, the lowest among all the APEC economies (Table 1.1).

¹ Different methods of measurement result in divergent estimates for China's GDP per capita. Regardless of the approach, China's income level is still comparatively low by world standards. According to the figures reported in the World Development Report, the dollar GDP per capita in China remained in the range of US\$300 to US\$700 during the mid-1980s to 1991. By comparison, using the purchasing power parity approach formulated by the United Nations International Comparison Program, the estimated dollar per capita GDP of China in 1986 was US\$1,044. See Ruoan and Kai (1994).

Figure 1.1

Region's Share in APEC Population, 1995



Source: Industry Canada compilations using data from various sources.

Note: 1995 APEC share in world population: 38.3%

1995 World Population: 5.7 billion

APEC: Asia Pacific Economic Cooperation

ASEAN: Association of Southeast Asian Nations

NICs: Newly Industrialized Countries

Table 1.1
Gross Domestic Product in China, APEC and Selected Economies — 1994

	GDP (US\$ billions)	GDP per capita	Average Annual Real Growth Rate 1980-1994
Asia APEC			
China	540.9	451	11.0
Asian NICs	824.2	11,053	7.9 **
ASEAN	459.2	1,359	5.5 **
Japan	4,690.0	3,7550	3.3
Non-Asia APEC			
Canada	547.2	18,628	2.8
United States	6,935.7	26,570	2.9
Mexico	357.9	4,095	1.4
Oceania	388.2	15,104 *	2.6 **
APEC	14,392.3	6,602 *	3.6
EU	7,029.0	18,948	2.0

Source: Industry Canada compilations using data from various sources; DRI (1997).

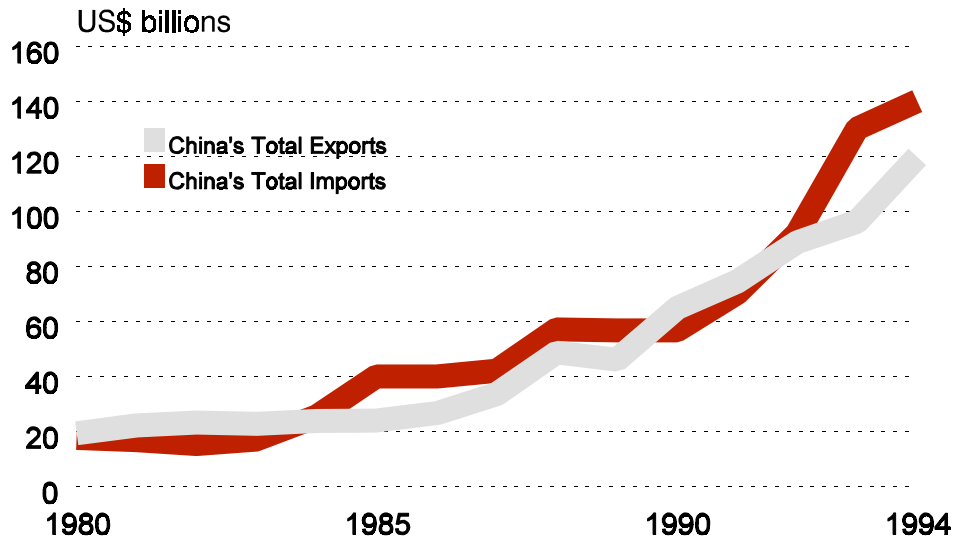
Note: * Figures for GDP per capita are calculated based on the 1994 GDP figures and 1995 population figures.

** 1980-1992 figures.

EU: European Union

Figure 1.2

China's Total Exports and Imports, 1980-1994



Source: World Trade Database, Statistics Canada.

At present, Canada's trade and investment linkages with China are weak. China took up a mere 1% of Canada's total merchandise trade in 1993. At the same time, China accounted for only 0.15% of Canada's inward and outward direct investment stock. This notwithstanding given China's huge market potential and its continual effort to liberalize fully its trade and foreign investment regimes, Canada's future trade and investment prospects with China cannot be underestimated. Indirectly, considering the dynamic and growing trade and foreign investment relationships that Canada has with some of China's most important Asian trading partners, Canada is expected to enjoy the spillover effects of potential benefits accruing to these Asian economies as a result of China's foreign sector reforms.

This study primarily asks the following hypothetical question: What is the impact if China TOTALLY relaxes its trade and foreign investment policy constraints? How would this affect China, Asia and other trading nations, including Canada? To answer these questions, this study adopts the computational general equilibrium (CGE) approach. Furthermore, some background is provided to understand the current evolving state of the Chinese external sector and its implications for Canada, Asia and other economies. China's outstanding trade barriers and price distortions that might have impeded the expansion of some of Canada's exports to China are also highlighted.

This study begins by examining the increased significance of trade and investment, the changing comparative advantage of China, and the changing inter-regional relationship in trade and investment between China and Hong Kong, Canada as well as other economies after 1978. The next section documents the extent of the trade and foreign investment restrictions in China in the mid-1980s, which marks the starting point for the simulation exercise using the CGE model. Current trade barriers and other policy distortions that influence Canada's exports to China are also discussed. The model results are analysed in Section IV, which discusses the effects on welfare and trade that might result through the total abolition of China's trade and foreign investment restrictions. Special emphasis is placed on the importance of the interaction between these two reforms and their impact on China and other economies. The last section summarizes the main findings of this study and suggests some policy responses for Canada and other economies.

2. CHINA'S EVOLVING EXTERNAL SECTOR AND ITS IMPLICATIONS FOR CANADA, ASIA AND OTHER ECONOMIES

China's trade and foreign investment reforms have brought about far-reaching effects in the economy's external sector. China's foreign activities have become much more significant in the country, which is fast becoming a very important player in the global trading system. Distinctive changes have occurred in China's export competitiveness. China has also become more closely linked with other countries. This section examines some of these important changes in the Chinese economy and their impact on other countries.

A. Increased Significance of Trade and Foreign Direct Investment in China

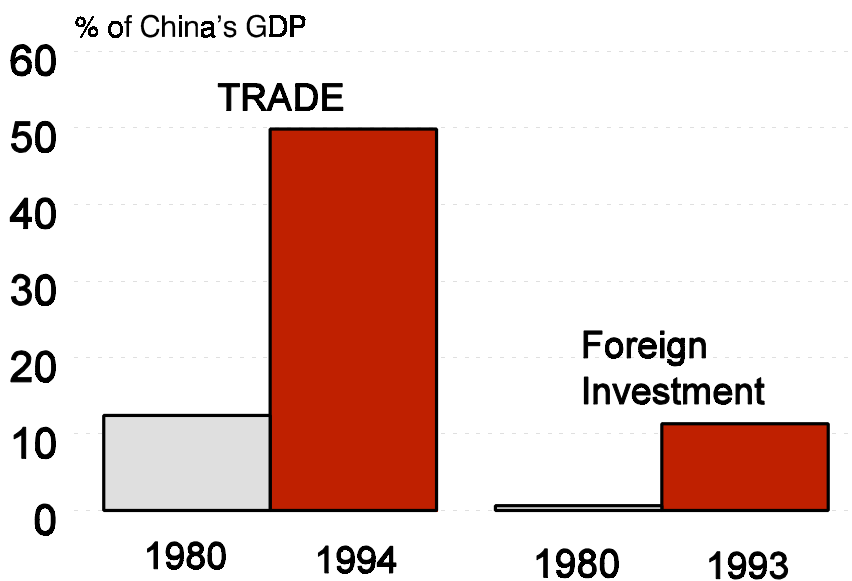
Since China's trade reform, the country has become a much more trade-reliant economy with phenomenal trade growth. China is quickly becoming a significant trading partner in APEC and in the world. This is in contrast to 1980, when China was a relatively closed economy with merchandise trade valued at US\$37 billion. Merchandise trade as a percent of China's GDP was only 12.4% at that time, the lowest among all APEC economies. In 1994, China's merchandise trade climbed to US\$260.1 billion and its trade as a percentage to the country's GDP more than quadrupled to 50.0% between 1980 and 1994 (Figure 2.1, Table 2.1). By 1995, China was the world's 11th largest trading nation.²

Between 1980 and 1994, China's exports grew from US\$19.3 billion to US\$119.8 billion, enabling China's share of exports to its GDP to more than triple from 6.5% in 1980 to 22.9% in 1994. Among all the APEC economies, China's export growth was the second fastest, lagging only behind Hong Kong during the 1980-1992 period. Since 1992, China has become the sixth largest exporter among all the 18 APEC member economies. Between 1980 and 1994, imports into China grew at a phenomenal 6.9 times, from US\$17.7 billion to US\$140.3 billion. During that same period, imports as a percent of China's GDP rose almost five times, at 26.9% in 1994. Import growth in China was the most impressive among all the APEC economies between 1980-1992. By 1992, China ranked as the fifth largest importer among all the APEC economies (Table 2.1).

² Sutton and Zhili Ge (1996).

Figure 2.1

China's Trade and Stock of Foreign Investment
as % of its GDP



Source: Industry Canada compilations using data from various sources.

Table 2.1
China's Merchandise Trade, 1980-1994

	Exports		Imports		Total	
	1980	1994	1980	1994	1980	1994
Value (US\$b)	19.3	119.8	17.7	140.3	37.0	260.1
% of GDP	6.5	22.9	5.9	26.9	12.4	49.8

Source: Ahmad, Rao, and Barnes (1996); World Trade Database, Statistics Canada.

Since China opened its economy, it has been very successful in attracting foreign direct investment, as indicated in the stark contrast between the 1980s and early 1990s. In 1980, accumulated foreign direct investment into China was US\$1.8 billion, or 0.6% of the country's

GDP. During 1981-1986, the annual average foreign investment into China accounted for only 1.8% of total world flows. This figure was considerably lower than China's neighbouring countries; the Asian Newly Industrialized Countries (NICs) (4.3% of the total world investment flows) and the ASEAN (2.8%). By 1993, accumulated foreign investment into China increased substantially to US\$65.9 billion. Between 1980 and 1993, the share of inward foreign investment stock as a percent of China's GDP increased by 18 times from a negligible 0.6% in 1980 to 11.0% in 1993. In 1992, China was the second largest foreign investment recipient among all APEC economies, absorbing 6.8% of total world investment flows and surpassing even the Asian NICs (at 5.5%) and the ASEAN (at 5.3%). At the same time, China was also becoming an important capital exporting country among developing countries. China's investment abroad rose from US\$0.1 billion in 1980 to US\$2.1 billion in 1993 (Figure 2.1, Table 2.2).

The re-entrance of China into the global trading system has led the country to emerge quickly as an important player in the international trading scene. Evidently, it is increasingly important for other nations to recognize the significance of the Chinese market and to seek out trade and investment opportunities with the country. In this regard, Canada's attempt to increase its trade and foreign investment ties with China will certainly bear fruit for both countries in the near future.

Table 2.2
China's Foreign Direct Investment Stock, 1980-1993

	Inward into China		Outward from China		Total	
	<u>1980</u>	<u>1993</u>	<u>1980</u>	<u>1993</u>	<u>1980</u>	<u>1993</u>
Value (US\$b)	1.8	65.9	0.1	2.1	1.9	68.0
% of GDP	0.6	11.0	0.0	0.3	0.6	11.3

Source: Industry Canada compilations using data from various sources; Ahmad, Rao, and Barnes (1996).

B. Changing Export Competitiveness in China

The removal of trade distortions in China has given rise to greater exportation in China in accordance with the country's comparative advantage. Figure 2.2 illustrates the changes in China's revealed comparative advantage (RCA) for 18 product categories during the decade of 1979/80 to 1989/90. The RCA index of a commodity group is the share of the commodity group in an economy's total exports divided by that commodity's share of world exports. Broadly

speaking, an RCA index above one (1) indicates that the country has a comparative advantage in a particular product. However, government policy distortions might have affected the level of the RCA index.

Between 1979/80 and 1989/90, the three most dynamic sectors bringing about a rise in RCA indices in China were clothing, footwear, and miscellaneous manufactures (including toys and sporting goods). The share of these goods in China's total exports rose dramatically from 16% in 1985 to more than 35% in 1990. China's export of these goods accounted for the country's increasingly significant share of world exports (Figure 2.3). Despite the decline in the RCA index in textiles, yarns, and fabrics between 1979/80 and 1989/90, China's comparative advantage in this sector remains strong. These developments suggest that China has been exporting more in line with its comparative advantage in traditional labour-intensive goods.

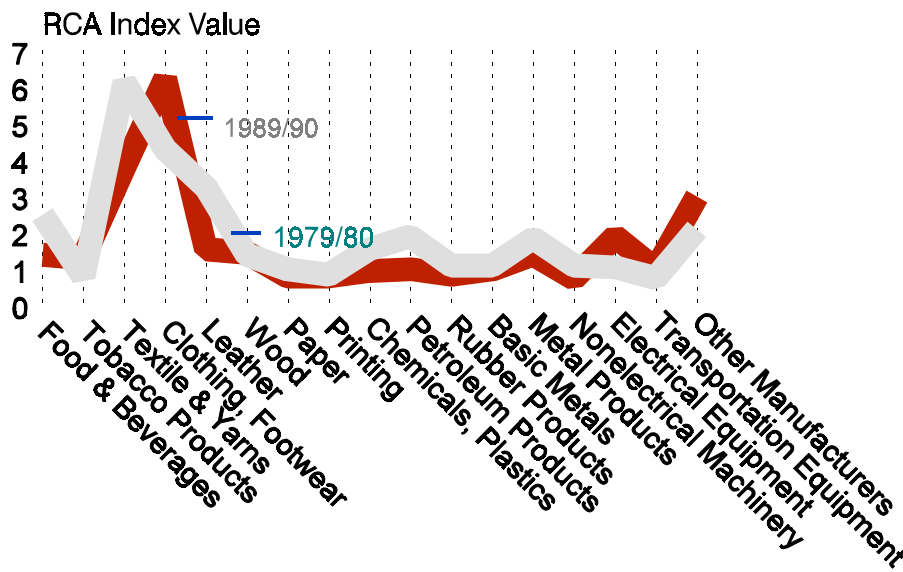
China has always been promoting and targeting the export of goods in capital-intensive and high-tech sectors. Since its reforms the progressive reduction in export subsidies and fiscal incentives in these industrial sectors have actually led to a decline in the aggregate RCA index of these industries; from 0.41 in 1979/80 to 0.24 in 1989/90. Between 1979/80 and 1989/90, there have been noticeable declines in the RCA indices in the chemical and petroleum industries. The RCA indices for non-electrical machinery and transport equipment remained substantially below unity.³ From Figure 2.2 it is clear that China's comparative advantage in paper products and basic metals has always been weak.⁴

³ Note that the surge in the RCA index for electrical equipment between 1979/80 and 1989/90 in China is almost exclusively because of the expansion of assembly operations in such product categories as radio receivers, telecommunications equipment, electrical space heaters, and domestic electrical goods (refrigerators and washing machines). These products accounted for about 75% of all China's exports of electrical equipment in the early 1990s.

⁴ This analysis on the changing comparative advantage in China relies heavily on the material provided in World Bank (1994).

Figure 2.2

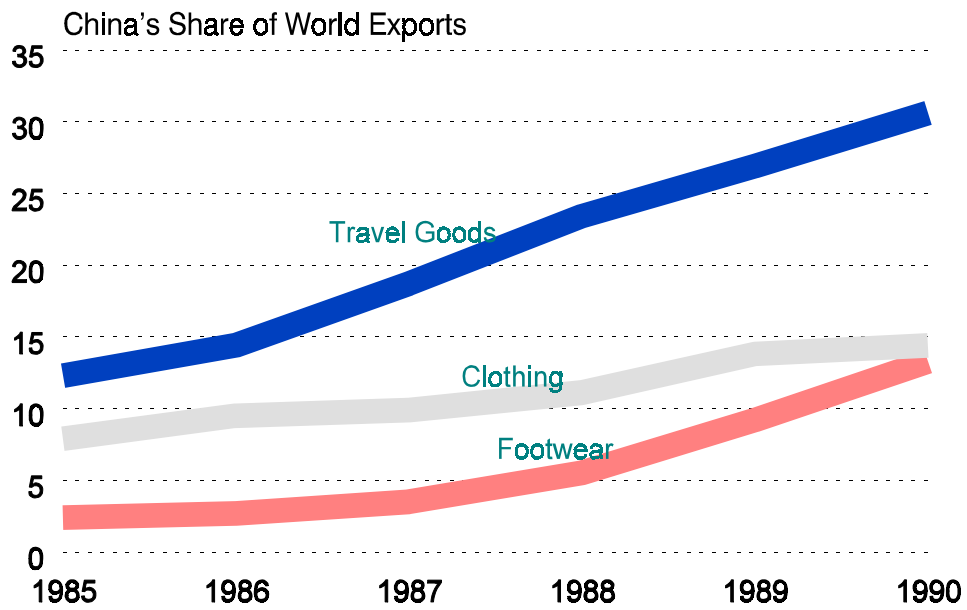
Evolution of China's Revealed Comparative Advantage (RCA),
Broad Manufactured Products, 1979/80 and 1989/90



Source: World Bank (1994).

Note: A revealed comparative advantage (RCA) index above one (1) indicates that the country has a comparative advantage in a particular product.

Figure 2.3
China's Share of World Exports in
Selected Manufactured Products, 1985-1990



Source: World Bank (1994).

For Canada, this means there are enormous potential opportunities for expanding trade with China. In 1990, some of the product categories in which Canada has comparative advantages are those in which China is not competitive and vice versa (Figure 2.4). While Canada's RCA indices are low in textile and miscellaneous manufactures, China's competitiveness in these areas is strong. Though there is no readily available information on the RCA index of clothing and footwear for Canada in the early 1990s, it can be safely assumed that Canada's RCA index in this category lags significantly behind China's RCA index. Canada shows very strong competitiveness in wood products, paper products and transport equipment. Canada's export potential to China in these areas looks very promising. As compared with China, the RCA index for petroleum refining and basic metals in Canada are also relatively strong.

While there is a continual increase in China's comparative advantage toward low-skilled labour-intensive exports throughout the 1980s, the opposite trend is evident in Taiwan, Hong Kong, and the Republic of Korea (Figure 2.5). The opening of the Chinese economy coupled with successive increases in unit labour costs in the more advanced Asian economies have forced these economies to move into the exportation of skilled-labour and capital-intensive products. The different states of economic development in China and the Asian NICs offer promising new possibilities of expanding trade opportunities between the two regions. Meanwhile, the attempt of the ASEAN countries to diversify away from resources into exporting labour-intensive manufactures in the 1980s has met with strong competition through the expansion of Chinese exports in similar products. Though increasing slightly, the RCA index of unskilled labour-intensive goods for the ASEAN remained below one (1) in the early 1990s (Figure 2.5).

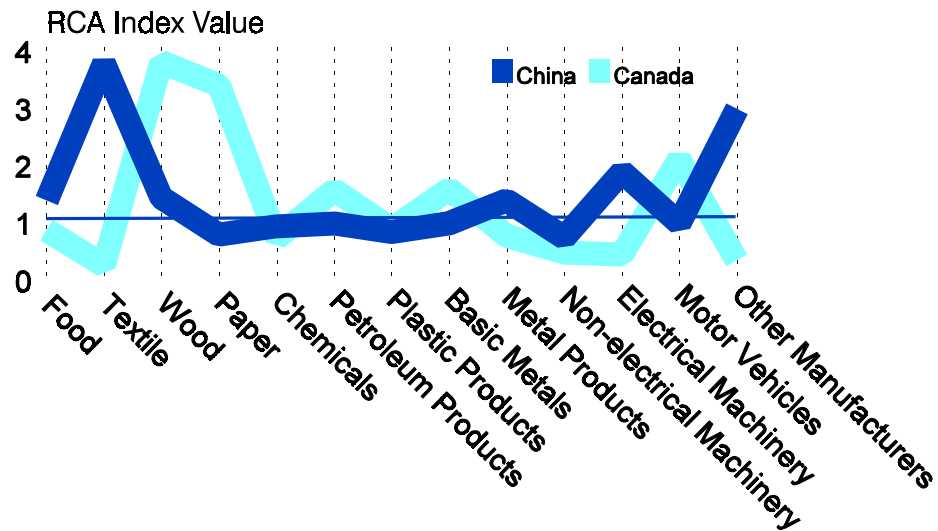
C. Changing Bilateral Inter-regional Trade and Investment Relationships

Since China's open door policy, the deeper integration of the Chinese and Hong Kong economies has been much stronger and deeper. Hong Kong's role as the trade intermediary between China and the rest of the world has been strengthened further. Foreign direct investment from Hong Kong into China has been linked directly with the export-oriented activities in China and has contributed significantly to China's export success.

China's trade reform has given Hong Kong an increasingly important role as a conduit for facilitating trade between China and the rest of the world. In 1993, China's exports to Hong Kong accounted for a significant 26% share (or US\$25 billion) of total Chinese exports (Figure 2.6). Nevertheless, this is misleading because Hong Kong has served increasingly as a gateway for Chinese exports rather than as a consumer of such exports. In 1984, China's exports to Hong Kong were US\$6.9 billion, 47.8% of which was re-exported to other countries through Hong Kong. By 1990, 88 percent (or US\$29 billion) of China's exports to Hong Kong was re-exported. Adjusting for Hong Kong's re-export of Chinese products, Hong Kong's share of China's total exports actually fell from about 14% in 1984 to 6% in 1990 (Figure 2.7). Taking into account these re-exports, China's exports to the U.S. and the European Community (EC) grew the fastest to become China's first and second largest export market in 1990. Japan was

Figure 2.4

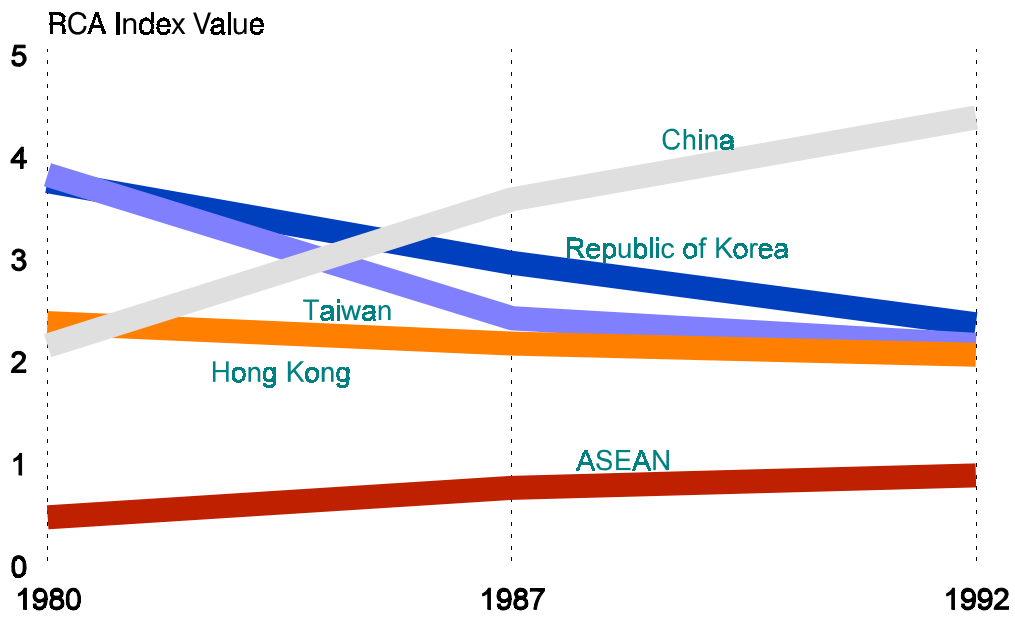
China's and Canada's Revealed Comparative Advantage,
Selected Industries, 1989/90



Source: OECD (1994), World Bank (1994).

Note: Owing to the lack of data, the match in the classification of commodities used to measure China's and Canada's RCAs is an approximation only and not directly comparable.

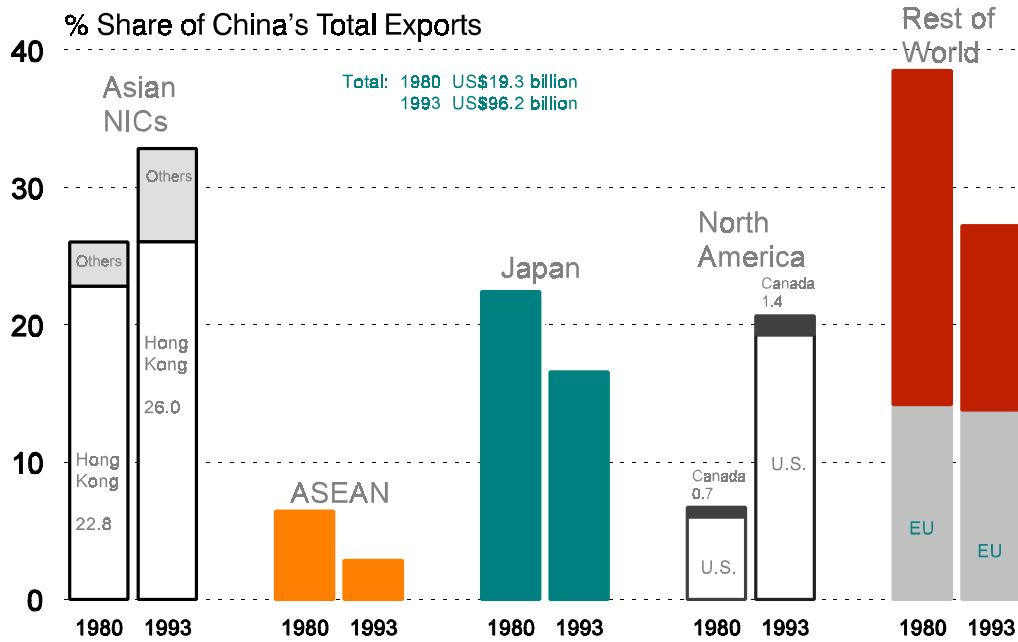
Figure 2.5
RCA of Unskilled Labour-Intensive Goods for
Selected Asia-Pacific Countries, 1980-1992



Source: Zou, G., et al (1990).

Note: Data for the year 1992 is a projection only.

Figure 2.6
Distribution of China's Exports by Region, 1980-1993
(unadjusted for re-exports through Hong Kong)

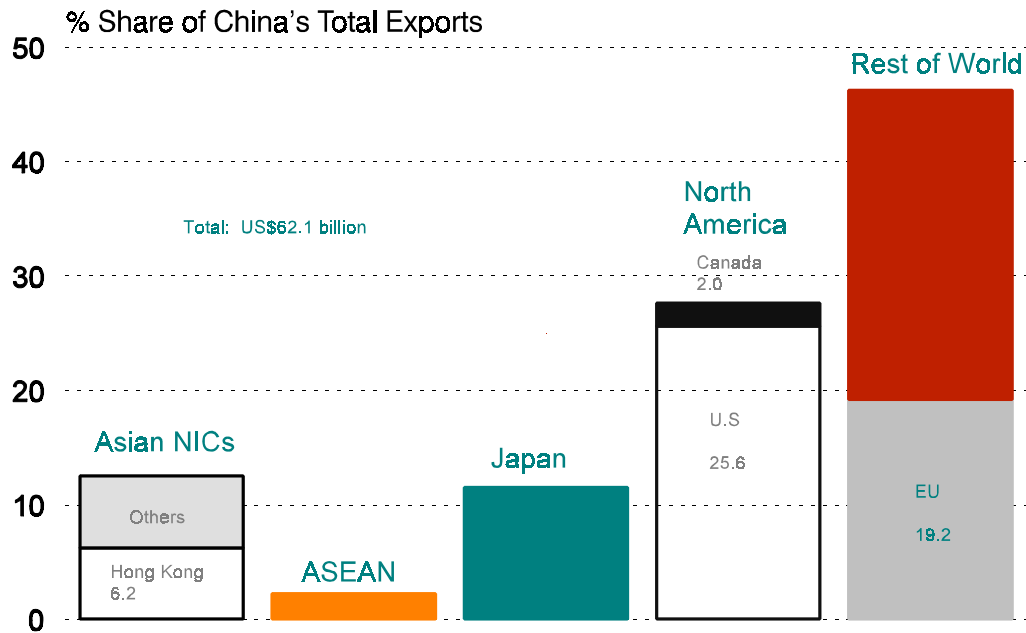


Source: Ahmad, Rao, and Barnes (1996); Industry Canada compilations using data from various sources
 Note: In 1990, China's exports to Hong Kong were US\$ 32.9 billion of which US\$29 billion was re-exported to other countries. Most of these re-exports were absorbed by the U.S. (36%), the EC (17%), and Japan (7%).

EC: European Community

Figure 2.7

Distribution of China's Exports by Region, 1990
(adjusted for re-exports through Hong Kong)



Source: World Bank (1994).

Note: Owing to the lack of data, figures for China's exports to the ASEAN do not include the Philippines.

China's third largest export market, absorbing 11.5% of China's total exports. The ASEAN remained a small export market for the Chinese economy.

The picture is similar on the import side. Figure 2.8, which is unadjusted for re-exports through Hong Kong, indicates that between 1980-1993 the share of China's imports from Hong Kong rose almost five-fold to 33.4%, or US\$43.4 billion in 1993. After the adjustment, almost all of the 27% (or US\$14.4 billion) of China's imports reportedly to have come from Hong Kong consisted of re-exports from other places of origin in 1990 (World Bank, 1994). Taking into account these re-exports, Japan became China's largest supplier, accounting for 20% of China's total imports in 1990. The second largest supplier of Chinese imports was the U.S. and the EC each accounting for about 15% of China's imports in 1990 (World Bank, 1994).

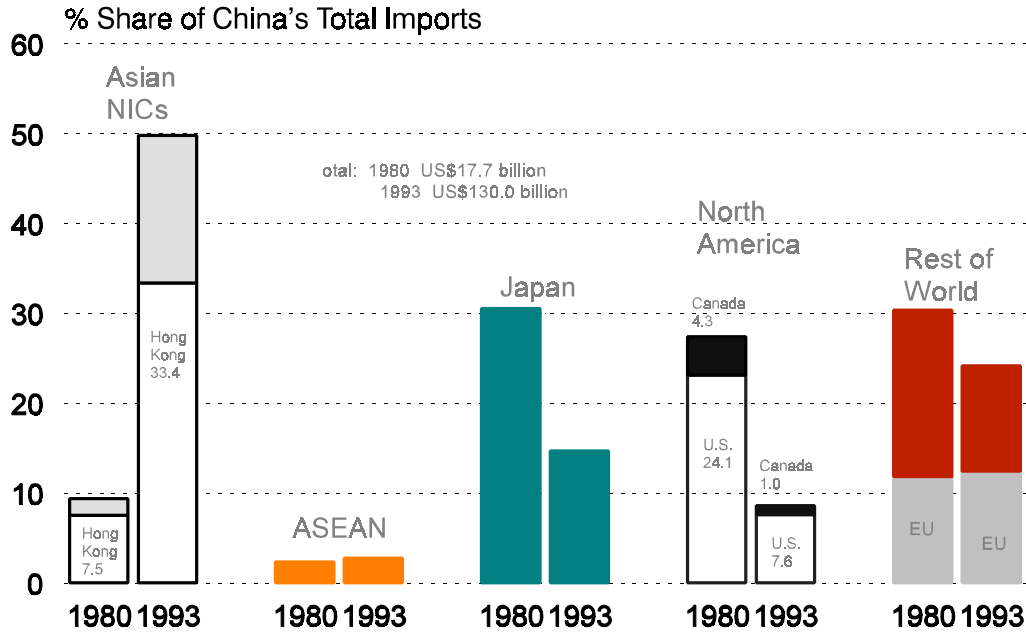
Hong Kong's contribution toward supporting China's growing trade position goes beyond being China's trade intermediary. Hong Kong's accumulated foreign investment in China has grown tremendously, from US\$863.4 million in 1980 to US\$41.5 billion in 1993. Furthermore, Hong Kong's share of China's total inward foreign investment stock grew from 48.9% in 1980 to 63.0% in 1993 (Figure 2.9). Most of these investments from Hong Kong have been directed to the export-oriented activities in China. This is a case in which foreign direct investment complements a country's export performance; mutual benefits are yielded for both the host and home economies. While China benefits from Hong Kong's human capital resources, managerial skills and marketing network, Hong Kong gains from the vast resources of much cheaper land and labour costs in China. Accumulated foreign investment from China to Hong Kong rose from US\$24.3 million in 1980 to US\$562.8 million in 1993 (Figure 2.10). China's investment in Hong Kong is primarily designed to utilize the middleman services of Hong Kong (Sung, 1996). Clearly, foreign sector reforms in China bring about significant benefits both to Hong Kong and China. The growing mutual dependence between the two economies can also be expected to continue into the future.

Despite considerable growth in trade between China and Canada since the early 1980s, Canada remains a small trading partner of China. The growth in trade between the two countries has not been as rapid as the growth of trade between China and the rest of the world. Canada has generally recorded an annual trade surplus with China of about US\$1 billion. Since 1992, however, the situation has been reversed (Sutton and Ge, 1996).

Adjusting for re-exports through Hong Kong, exports from China to Canada reached US\$1.2 billion in 1990, or 2% of China's total exports (Figure 2.7). Apparel and fabrics accounted for more than half of China's total exports to Canada. In 1991, 18.4% of Canada's total clothing imports were from China. If Multi-fibre Agreement import restrictions were eliminated, this figure might have been even higher. Recently, other rapidly growing imports from China to Canada include miscellaneous manufactures (jewellery, toys, etc.), electrical manufactures, manufactured housing fixtures and bicycles (Sutton and Ge, 1996).

Figure 2.8

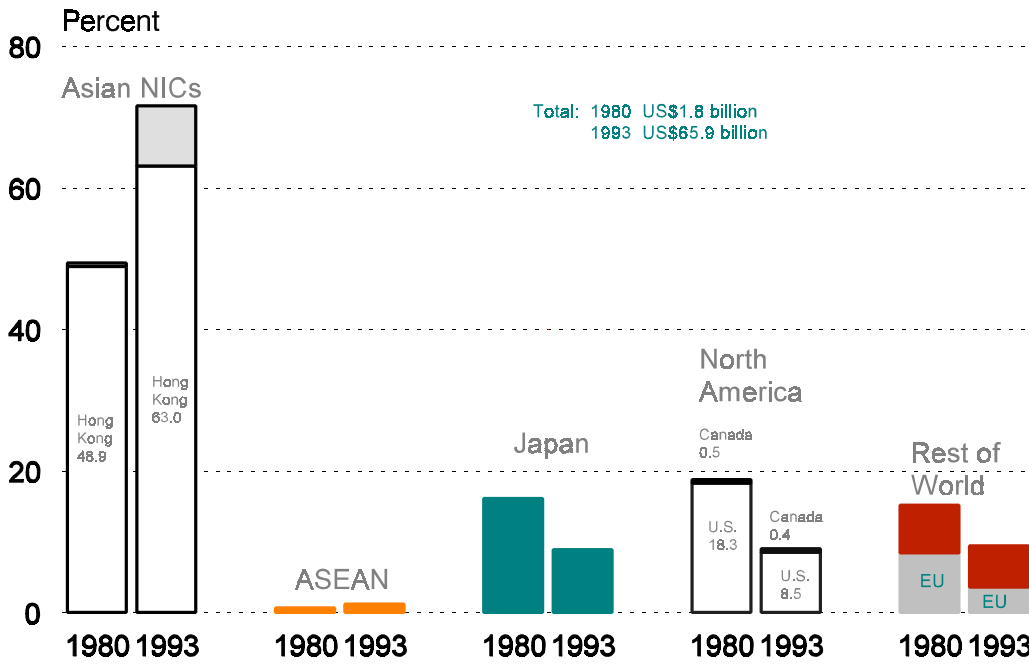
Distribution of China's Imports by Region, 1980-1993
(unadjusted for re-exports through Hong Kong)



Source: Ahmad, Rao, and Barnes (1996); Industry Canada compilations using data from various sources.

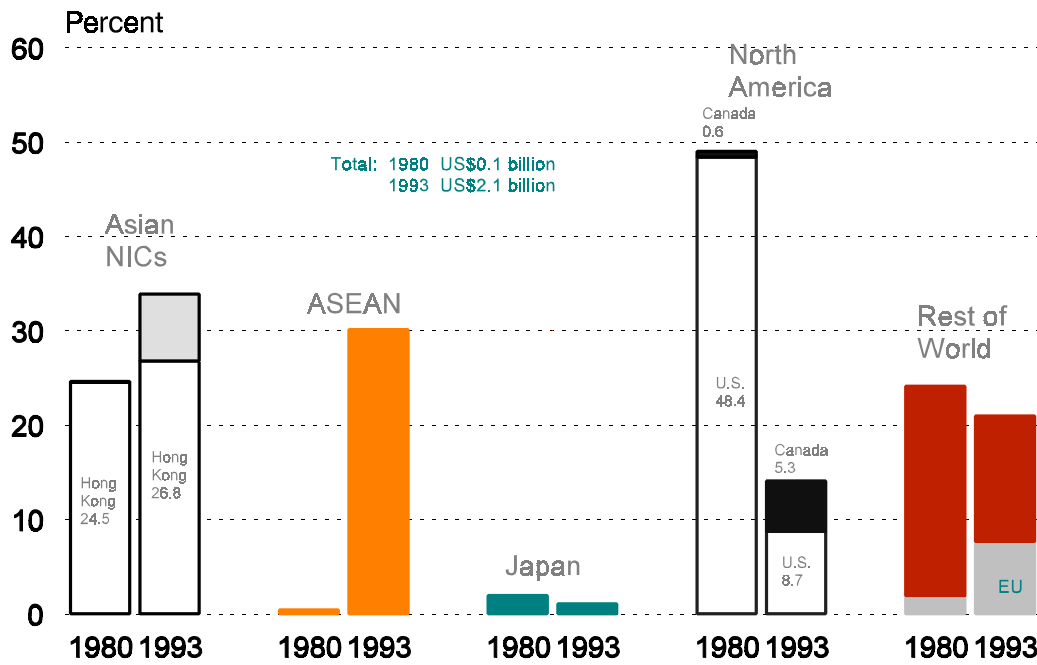
Note: In 1990, 27% of China's imports were from Hong Kong, almost all of which were re-exports from other places of origin. 45% of these re-exports through Hong Kong were from Taiwan and Japan.

Figure 2.9
Distribution of Inward Foreign Investment Stock into China, by Region, 1980 and 1993



Source: Ahmad, Rao, and Barnes (1996); Industry Canada compilations using data from various sources.

Figure 2.10
Distribution of Outward Foreign Investment Stock
from China, by Region, 1980 and 1993



Source: Ahmad, Rao, Barnes(1996); Industry Canada compilations using data from various sources.

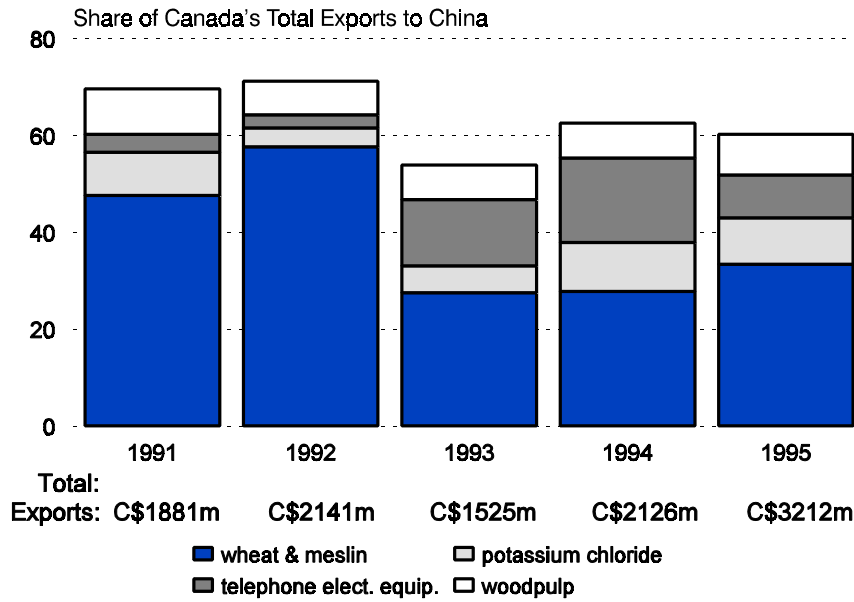
Instead of a steady increase in Canadian exports to China since the opening of the Chinese economy, Canadian exports to China tend to fluctuate from year to year. Canada's exports to China were valued at about US\$2.2 billion in 1994, up from US\$1.2 billion in 1984, and down from a record US\$2.6 billion in 1988 (Sutton and Ge, 1996). Part of the reason is the heavy reliance of Canada on exporting only a few commodities to China. Figure 2.11 indicates that during 1991-1995, the largest four commodities exported by Canada to China at the 6-digit HS classification code already constitute between 56% to 71% of Canada's total exports to the country per annum. These are wheat and meslin (27.5% to 57.6%),⁵ potassium chloride (3.9% to 10.1%), electrical apparatus for telephone (2.7% to 17.5%), and pulp and waste paper (7.1% to 9.4%). Moreover, Canada's exports to the country have not diversified into areas identified to have high export potential (e.g., wood products, paper products, basic metals, and transport equipment).⁶ Section III elaborates how restrictive trade constraints and price distortions in China may still be constraining the diversification and expansion of Canada's exports to the country.

In absolute terms, investments between China and Canada remain small. Accumulated investment from Canada to China amounted to US\$263.6 million in 1993, or 0.4% of China's total. The stock of Chinese investment in Canada was US\$111.3 million, or 5.3% of China's total (Figures 2.9 and 2.10). To foster Canada's investment relationship with China, Canada has a distinct advantage of having a large pool of skilled immigrants from Hong Kong. There are now about 750,000 Chinese in Canada, 90 percent of whom are of Cantonese origin. In 1993 alone, the number of immigrants in Canada from Hong Kong totalled 37,000. About 40,000 Canadians reside in Hong Kong (Grant and MacLure, 1995). Given the unique role of Hong Kong as the link between China and other countries, the prospect of furthering business ties between China and Canada could be as good as Canada's ability to utilize these human resources from Hong Kong.

⁵ The fluctuation of Canada's exports to China stems partially from the importance of Canada's exports of wheat and meslin to the country which tends to vary according to China's own production shortfalls.

⁶ For the identification of these products, refer to Figure 2.4 and the section on Changing Export Competitiveness in China.

Figure 2.11:
 Share of Canada's Top Four Commodity Exports to China (1991-1995)
 - at 6-Digit HS Classification Code



Source: Trade Data on Line, Statistics Canada.

HS: Harmonized System

It has been noted that after adjusting for re-exports through Hong Kong, the U.S. has become one of the most significant export markets and import suppliers of China. With the heavy reliance of the Canadian economy on the U.S., Canada will also benefit indirectly as the U.S. profits from cheaper imports and increased exports as a result of China's trade reform. Similarly, given the dynamic growth and increased trade and investment ties that Canada has with Japan, Hong Kong, and the Asian NICs at large, Canada is also expected to enjoy spillover effects from benefits that these Asian economies might derive from China's foreign sector reforms.

3. THE EXTENT OF CHINA'S TRADE AND FOREIGN INVESTMENT RESTRICTIONS

The purpose of this section is to estimate the extent of China's sectoral trade restrictions as well as its foreign investment restrictions at the original equilibrium starting in the mid-1980s.⁷ These estimates are used as policy parameters in specifications for the model. The first sub-section provides the methodology and the resulting estimates of the extent of China's trade restrictions in the mid-1980s. Trade restrictions and price distortions in China that might have impeded the expansion of some of Canada's exports to China in recent years are also discussed. The second sub-section estimates the extent of China's foreign investment restrictions in the mid-1980s.

A. Extent of China's Trade Restrictions: mid 1980s

The complex nature of the Chinese economy combines the legacy of a rigid, centrally planned regime with features of a less-developed economy. This makes the effects of China's trade policy restrictions not readily observable let alone transparent. Trade policy instruments such as tariffs, licensing, trade taxes and subsidies provide no immediate indication of their trade inhibiting effects in such a two-tier planned/market price system, dual exchange rate regime and administered trade plan.

A more straightforward approach to quantify the extent of Chinese trade restrictions is to use one overall distortive measure — to estimate the difference between China's domestic market price and the international price. This is the approach taken by this study. Figures 3.1 and 3.2 give a graphical representation of the estimated sectoral price differences between the Chinese market price and the world price for Chinese import and export sectors in the mid-1980s. A more detailed discussion is provided in Appendix 3.A.

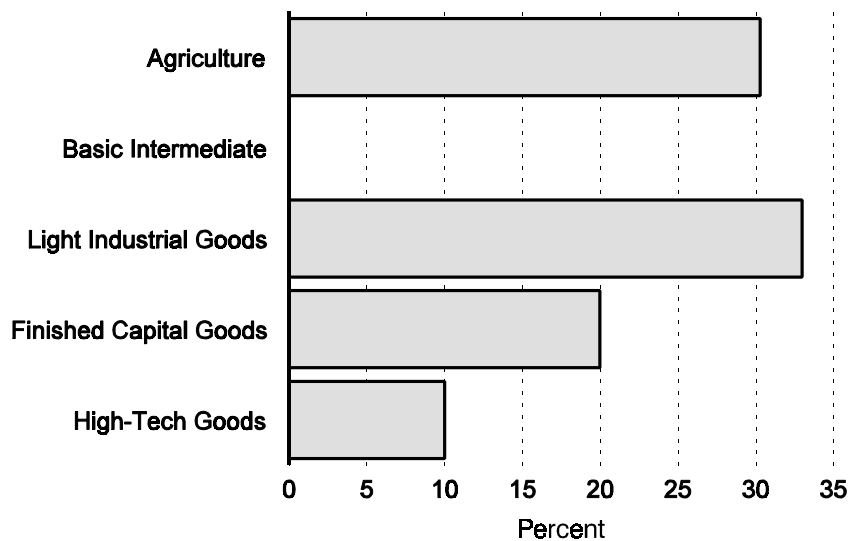
The sectoral import restriction indicator is calculated as the difference between the higher average sectoral Chinese market price and the lower average sectoral international price. The larger the price gap, the more restrictive the sector. The estimated gaps between these two prices in the agricultural (30.3%) and light-industrial-goods (33%) sectors⁸ are fairly substantial. With

⁷ China's foreign sector reform started in the late 1970s. To capture the full effects of China transferring from a enclosed autarkic state into an open economy, the base model is constructed to incorporate China's trade and foreign investment restrictions in the earlier years of the mid-1980s in which the reforms were still relatively pre-mature (and in which data is available) instead of some later years in the 1980s.

⁸ Table 3.1 corresponds the sectoral classification used in this study with UN SITC classification codes.

Figure 3.1

Sectoral Import Restriction Indicator in China (mid-1980s)



1. A sectoral import restriction indicator is calculated as the percentage change between the higher average Chinese market price and the lower average international price for major categories in a particular sector. This sectoral price difference can be interpreted as being influenced by an ad valorem tariff rate or the per unit rent associated with the quantitative import restriction in a more restrictive sector is represented by a larger percentage change between the two average prices. For details, see text and Appendix 3.A.
2. In the basic intermediate goods sector, the estimated average Chinese market price is roughly equal to the estimated average international price.
3. Source: Lam (1996).

Figure 3.2
Sectoral Export Restriction Indicator in China (mid-1980s)



A sectoral export restriction indicator is calculated as the percentage change between the average Chinese market price and the average international price for major categories in a particular sector. A positive indicator can be interpreted as being influenced by the imposition of an ad valorem export tax (or a quantitative maximum export quota) in the sector. A negative indicator can be interpreted as indicating that the sector is subject to an ad valorem export subsidy (or a quantitative minimum export quota). The larger the price as indicating differential, the greater the distortive effect on the sector as a result of China's export restrictive measures. For details, see text and Appendix 3.A.

Source: Lam (1996).

China's trade liberalization, more significant increases of imports into these sectors would be expected compared with other sectors. Differences between the average Chinese market price and the average international price in the finished capital good sector and the high-tech goods sector are estimated to be 20% and 10% respectively. Despite the extensive use of quantitative import constraints in most of the categories within the basic intermediate goods sector (e.g., iron and steel, and plastic materials), the calculated average Chinese market price is roughly equal to the estimated average international price in this sector.

In some export sectors, the Chinese sectoral average market prices are estimated to be below the sectoral average international prices. In such instances, the sectoral price differential can be interpreted as being influenced by the sectoral export tax rate or the per unit rent associated with the maximum export quota target⁹ in that sector. The larger the price differentials, the more restrictive these export constraints are on the sectors. This type of constraint is found to restrict exports substantially in the basic-intermediate-goods sector, the light-industrial-goods sector and the agricultural sector. The average Chinese market prices are estimated to be 32.4%, 25%, and 22.3% above their corresponding average international prices respectively.

⁹ The maximum export quota constraint is a quantitative export restriction in which firms are not allowed to export above certain quantities in these categories. In China this constraint was prevalent in the coal, oil, and agricultural industries in the mid-1980s.

Table 3.1
Matching Commodity Classification in the Model
with UN Standard International Trade Classification Codes

Model	United Nations SITC Codes
Agriculture	00-25, 29, 41-43 agriculture, food manufacturing, hunting, trapping, lumber, pulp and paper, and fish landings.
Basic Intermediate	26, 35, 52-53, 55-59 (less 553), 62-64, 66-68 (less 667) fabricated goods, primary metals, wood products, textile fibres, electrical energy, chemicals NES, mining, and energy products.
Light Industrial Goods	61, 65, 82-85 clothing, yarn and cloth, and furniture.
Finished Capital Goods	71,73, 95,96 vehicles and parts, machinery and equipment.
High-Tech Manufactures	51, 54, 553, 667, 69, 72, 81, 86, 89, 81, 86, 89 pharmaceuticals, cosmetics, jewellery, instruments, scientific equipment, electrical machinery, fixtures, electrical equipment, office supplies, printing and publishing.

Source: Nguyen, Perroni, and Wigle (1990).

Chinese market prices are estimated to be above international prices in certain other industries, such as chemical products and some heavy machineries. In these instances, the Chinese government has to subsidize exporters with an amount equivalent to the difference between the two prices per unit. It is expected that when these export subsidies are removed in the finished capital goods and high-tech goods sectors, exports in these sectors will diminish.

China's Trade Restrictions and Price Distortions on Canadian Exports: early 1990s

It has been shown that despite China's trade liberalization initiatives since 1978, Canada's exports to China continue to be highly concentrated in a few items (i.e., wheat and meslin, mineral salt, electrical apparatus for telephone lines, and certain woodpulp). Canada seems to be experiencing difficulties in expanding and diversifying exports to China in areas where Canada is identified to have an export competitive edge (e.g., wood products, paper

products, transport equipment, and basic metals). This section investigates some of the trade barriers and price distortions still outstanding in China to help shed some light on the Canadian phenomenon. Appendix 3.B provides more details.

Overall, Canada's revealed comparative advantage is concentrated in foodstuff, crude materials, and resource-based manufactures (Figure 2.4 and Appendix 3.B). These are also areas considered to be essential to the development of the Chinese economy and are therefore still subject to price controls in China. In many instances, the Chinese government has kept domestic market prices substantially below corresponding world prices (e.g., pork and beef, woodpulp, nonconiferous plywood, coal, and metal ores). Prices of some basic producer inputs such as coal and timber are depressed by as much as 90% and 50% below their world prices. These artificially low domestic market prices have precluded foreign competition to a great extent and are significant barriers to international trade (Table 3.2 and Appendix 3.B).

Certain industries that are of interest to Canadian exporters benefit from artificially extremely low intermediate input market prices in China, making these industries seemingly competitive worldwide for the country. Any efforts to increase exports of these industries to China would be futile even if trade barriers were lifted. A notable example is the iron and steel industry, whose domestic prices are reported by 25% to 66% below the corresponding duty-inclusive world prices. A likely explanation for China's competitiveness in this capital-intensive industry lies in its extremely low domestic plan price of coal (which is about 90% below the world price). Another example is in the paper product industry, which benefits from the artificially low price of woodpulp and lumber in China (Table 3.2 and Appendix 3.B).

Many products that might be of interest to Canadian exporters are still subject to China's import plan (e.g., wheat and meslin, fertilizers, woodpulp, cork and wood, metal ores, and mineral salt).^{10,11} In fact, three of the four largest Canadian exports to China are still under the import plan (i.e., wheat and meslin, mineral salt, and woodpulp). They account for 40% to 68% of total Canadian exports to China per annum during 1991-1995 (Figure 2.11). This implies that both the level and composition of imports in these areas are still strictly controlled and are not

¹⁰ Using the same argument for price controls, these are products that the Chinese government finds to be crucial to the development of the economy and are therefore still subject to extensive administrative controls.

¹¹ In order to control the amount of import subsidy that the Chinese government has to pay out, the country's import plan is necessary for products that are subject to depressed state-fixed domestic prices. Note that for wheat and fertilizers, the Chinese government used to pay large amounts of import subsidies. These subsidies have been largely eliminated as a result of recent price adjustment efforts.

Table 3.2
China's Trade Restrictions and Price Distortions on Selected Products
that Affect Canada (early 1990s)

Product Group	Depressed Chinese Product Price	Depressed Chinese Intermediate Input Price	Import Plan	High Tariffs (>= 80%)
Wheat			✓	
Live Animals	✓			
Fertilizer			✓	
Pulp & Waste Paper	✓		✓	
Cork & Wood	✓		✓	
Plywood			✓	✓
Paper & Paperboard		✓		
Coal	✓			
Metalliferous Ores	✓		✓	
Iron & Steel		✓		
Potassium Chloride (i.e., mineral salt)			✓	
Transport Equipment				✓

Source: World Bank (1994). For details, see Appendix 3.B.

✓ Indicates where import restrictions/price distortions prevail in the corresponding industry in China in the early 1990s.

influenced by market forces. Moreover, these imports are administered by only a few assigned foreign trading corporations (Table 3.2 and Appendix 3.B).

In summary, many major and potential Canadian exports to China are still subject to the import plan in China. Trade in these areas is still administratively controlled and is not subject to market forces. The removal of trade barriers, however, must coincide with other reforms, most notably price reforms. In cases where heavy import subsidies still apply, China's import plan

cannot be abolished unless it is preceded by price reforms (i.e., in areas such as woodpulp, cork and wood, and metal ores). In cases where products are protected by administered low intermediate input prices, there will be no incentives for trade expansion even if trade barriers are abolished (i.e., in areas such as iron and steel, and paper products). Trade expansion will likely occur in certain products (e.g., automobile) after the removal of very high import tariffs.

B. Extent of Foreign Investment Restrictions: mid-1980s

Although China has changed laws since 1979 to start encouraging the inflow of foreign capital,¹² this inflow has still been small-scale compared with other economies, during the mid-1980s. By the end of 1985, accumulated actual foreign direct investment (FDI) in China was only US\$2.4 billion, or about 0.8% of its GDP.¹³ By comparison, Brazil, whose economy is about two-thirds as large as China's, has actively pursued a strategy of welcoming foreign direct investment for most of the twentieth century. Brazil has a stock of FDI at about US\$30 billion, or 12% of its GDP by the mid-1980s (World Bank (1988), p.53).

Portfolio investment in China in the mid-1980s was also relatively small — compared with other economies. In 1985, total debt/GDP, total debt/exports, or debt service/exports were 8%, 80%, and 7% respectively in China — compared with 56%, 348%, and 53.3% for Brazil. By the end of 1986, China's debt rose to a level of US\$24.9 billion, or 9.2% of its GDP (World Bank (1988)).

Considering that China's foreign investment reform was at its early stage in the mid-1980s, a substantial wedge between the higher Chinese rate of return on capital and the lower rate of return in other regions would be expected during that period. This difference in the rates of return between China and other regions can be interpreted as a measure of the restrictiveness of China's policy toward inward foreign investment. In the event where capital is perfectly mobile among regions, the rate of return on capital is expected to be equal among all regions. The real rate of return on capital in China is estimated to be 14.7% and the corresponding rate in other regions is estimated to be 5.4% in the mid-1980s. In essence, the Chinese real rate of

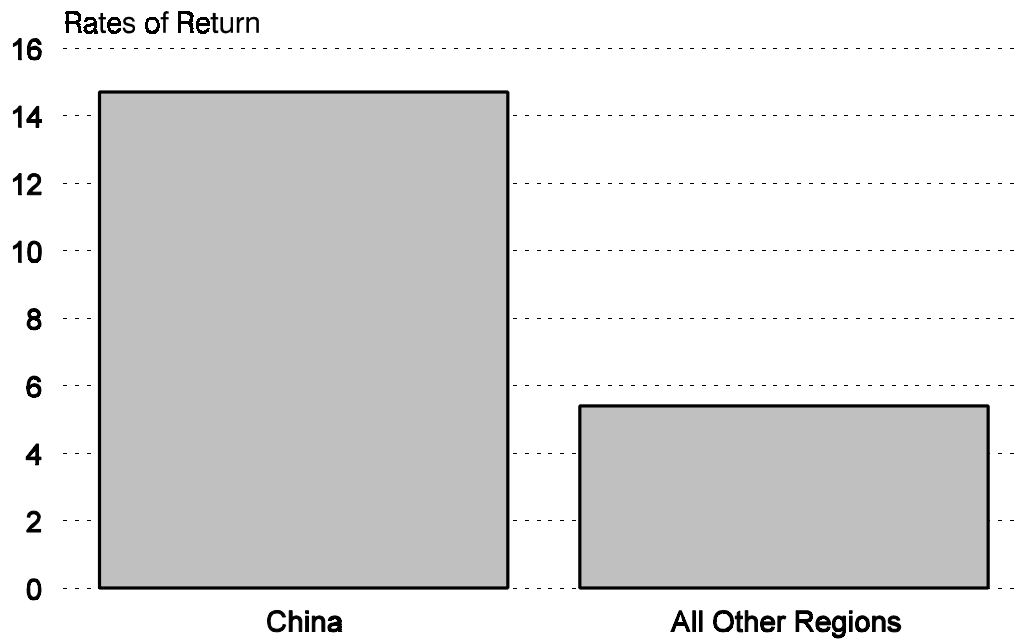
¹² Given that China is largely a capital importer (as opposed to being a capital exporter), this section and the interpretation of the model results focus only on the inflow of foreign capital into China.

¹³ In China, six different forms have been included in the statistics and examples of FDI, although normally only four kinds are regarded as FDI. The four types of FDI include wholly foreign-owned ventures, equity joint ventures, some contractual joint ventures, and joint explorations (mainly in offshore oil explorations). Very limited actual investment is involved in the additional two forms that have been included; which are compensation trade and processing and assembling. Compensation trade allows foreign firms to provide machines or product designs to Chinese firms. In return, foreign firms obtain part of the output as payment.

return on capital is estimated to be as great as 2.7 times the corresponding rate in other regions (Figure 3.3).^{14,15}

¹⁴ In the model used it is assumed that capital flows into China are induced only by the difference between the higher Chinese rate of return and the lower rate of return in all other regions. Essentially, the model treats foreign capital into China as equivalent to portfolio investment. This is because while portfolio capital flows are mainly driven by the differences in the returns to capital among countries, the motivation for FDI flows are more complicated. For the recipient country, the acquisition of advanced technology is often cited as a more important benefit than the increase in investment associated with FDI (World Bank (1988), pp. 52, 244, 251).

¹⁵ The difference in the rate of return on capital between China and other regions is estimated as follows. In 1986, the profit divided by the total capital stock in China for all state-owned independent accounting individual enterprises (accounting for 68.8% of total industrial gross value output in China) is reported to be 20.7% (Chinese Industrial Economic Statistical Yearbook (1993, p.67)). This figure is adjusted downward because the definition of profit in the state-owned enterprises in China also includes outlay items such as bonus payments to workers and enterprise "benefit" fund (Sicular (1995, p.10, 15)). Quite often, these bonuses can be substantial and it is thus assumed that the rate of return on capital in China is 14.7% in 1986. For all other regions, the U.S. rate of return on capital in 1986 (at 5.4%) is taken as the representative rate (Survey of Current Business, April, 1995).

Figure 3.3**China's and Other Regions' Rates of Return (mid-1980s)**

Source: Lam (1996). See also text for further details.

4. THE IMPACT OF CHINA'S TRADE AND FOREIGN INVESTMENT REFORMS

This section presents the results of three experiments using the CGE model to demonstrate the impact of a total abolition of China's trade and foreign investment restrictions on China, Asia and other countries.^{16,17} Experiment A shows the outcome of abolishing China's trade restraints only,¹⁸ keeping other distortions intact. Experiment B looks at the removal of only the foreign investment restriction in China. To investigate the joint effect of foreign investment liberalization and trade reform, Experiment C estimates the impact of removing both trade and foreign investment restrictions in China. Appendix 4.A describes the computational general equilibrium model that is used.

The first part of this section examines the overall welfare effects of China's trade and foreign investment reforms, concentrating on the interactive impact of both reforms. The results strongly suggest that for EVERY region in the model, China's trade reform alone or foreign investment reform alone would not be nearly as successful as implementing both reforms simultaneously. The second sub-section studies changes in the global trade structure resulting from China's trade reform (Experiment A).

Trade restrictions are given as quantitative constraints in the model. Some export sectors in China are subject to a maximum export quota constraint in which exporters cannot export above certain pre-specified amounts for these sectors. Chinese domestic prices in such sectors are below the corresponding international prices. Therefore, if the restrictions are removed, exports from China are expected to expand in these areas. Such sectors include agriculture, basic intermediate goods, and light industrial goods (Figure 3.2).

¹⁶ The model considers the five following regions: China, the Asian NICs, the ASEAN, Japan, and the Rest of the World. Table 4.1 shows the regional classification used in this study.

¹⁷ For the purposes of this study, the Asian NICs include Hong Kong, South Korea, Chinese Taipei, and Singapore. The ASEAN includes the Philippines, Thailand, Indonesia and Malaysia. Politically, Hong Kong and China became one entity on July 1, 1997. Economically, the two economies are very diverse and for the purpose of this exercise, Hong Kong is grouped as a member of the Asian NICs. For similar reasons, although Singapore is a member of the ASEAN, it is grouped within the Asian NICs in this study.

¹⁸ For most major export items in the light-industrial-goods sector (e.g., clothing, fabrics and footwear), China is bound by the multilateral Multi-Fibre Agreement. The removal of the export restrictions in this sector entails a phase-out of this Agreement.

Table 4.1
Regional Classification in the Model

Regions	Country
Japan	Japan
Asian NICs	Hong Kong, South Korea, Chinese Taipei, Singapore
ASEAN	Philippines, Thailand, Indonesia, Malaysia
China	primarily the People's Republic of China, Mongolia, and some former centrally planned economies in Eastern Europe
Rest of the World	mainly Canada, the U.S., EEC, Australia and New Zealand, Africa, most of Latin America

Source: Nguyen, Perroni, and Wigle (1990).

Certain export sectors shown in the model are subject to a minimum export quota constraint in which the Chinese government imposes minimum quantities that must be exported. Essentially, the Chinese government must subsidize exporters to enable them to fulfill their minimum export targets. Chinese domestic prices in these sectors are above the corresponding international prices and exports are expected to drop when the minimum export rule is lifted. These sectors include finished capital goods and high-tech goods (Figure 3.2). All imports into China are subject to quantitative import licensing controls. Chinese domestic prices for imports are estimated to be relatively higher than the corresponding international prices, and imports are therefore expected to increase once the quantitative import constraints are removed (Figure 3.1).

The difference between the higher Chinese rate of return and the lower world rate of return is represented in the model as China restricting the inflow of foreign investment (Figure 3.3). In a simulation experiment examining the results when China liberalizes its foreign investment restriction, China reaches a new equilibrium state when sufficient foreign investment has flowed into China to equalize the Chinese and the foreign rates of return.

A. Welfare Effects: China's Trade and Foreign Investment Reforms

Welfare gains from China's trade reform alone are shown in Experiment A to be positive yet relatively small for all regions; from 0.0% to 0.2% of each region's GNP (Figure 4.1). This regional welfare effect can be further decomposed into the terms of trade effect and the efficiency effect.

The terms of trade index is broadly defined as the ratio of the average price index of a country's exports over the average price index of a country's imports. Thus a positive change in the index indicates an improvement in the country's terms of trade. By definition, a terms of trade gain/loss represents only inter-regional transfers. That is, a region's terms of trade gain must necessarily be another region's terms of trade loss. From a global perspective, the terms of trade effect nets out to zero.

Unlike the terms of trade effect, efficiency gains are expected for all regions in Experiment A. The effect of trade distortion is to drive a wedge between the Chinese domestic price and the international price, resulting in inefficiencies for all regions. The greater the price difference, the bigger the inefficiency generated. Regional efficiency gain is realized in Experiment A as these price differences are eliminated, resulting in a more efficient global allocation of commodities.

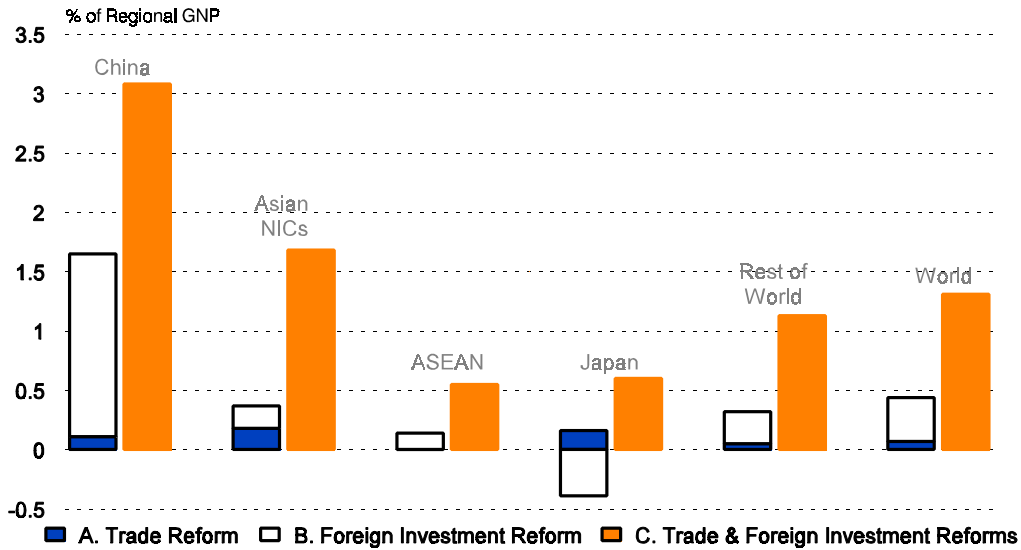
The results indicate that although China suffers from an overall terms of trade loss that has been transferred to other regions (Figure 4.2), its efficiency gain must have outweighed its terms of trade loss, resulting in an overall welfare gain of 0.11% of China's GNP (or US\$2.6 billion) in Experiment A. For other regions, terms of trade gains are reinforced with efficiency gains, resulting in overall welfare gains that range from a negligible US\$0.02 billion for the ASEAN to US\$0.65 billion for the Asian NICs, or 0.18% of their GNP (Figure 4.1).

The Asian NICs consist of small, more open economies vis-à-vis other regions.¹⁹ As a consequence, changes in the trade policy of an external economy (in this case, China) tend to have a larger impact on the Asian NICs. Furthermore, using the trade intensity index,²⁰ one finds that the Asian NICs are closely linked with China in trade. Thus one would also expect the Asian NICs to enjoy the largest welfare gains among all the non-Chinese nations when China

¹⁹ The data indicate that the trade/GNP ratios are 54.2% in the Asian NICs, 24.6% in Japan, 16.3% in the ASEAN, and 3.2% in the Rest of the World region. The actual figures especially for the Rest of the World region, would be higher if the trade figures reported in this study included intra-regional trade (e.g., intra North American trade, and intra EU trade). This exclusion is a necessary requirement when the original data for different countries (e.g., Rest of the World) are aggregated as a single region in the model.

²⁰ The trade intensity index from region i to j is defined as $I_{ij} = (X_{ij}/X_i)/(M_j/M_w)$ where X_{ij} is the value of region i 's exports to j , X_i is the total exports from region i , M_j is the total imports from region j , and M_w is total world imports. The trade intensity index gives an indication of the underlying strength of the trading relationships between two regions, abstracting from the differences in the size of the total trade from each of the regions.

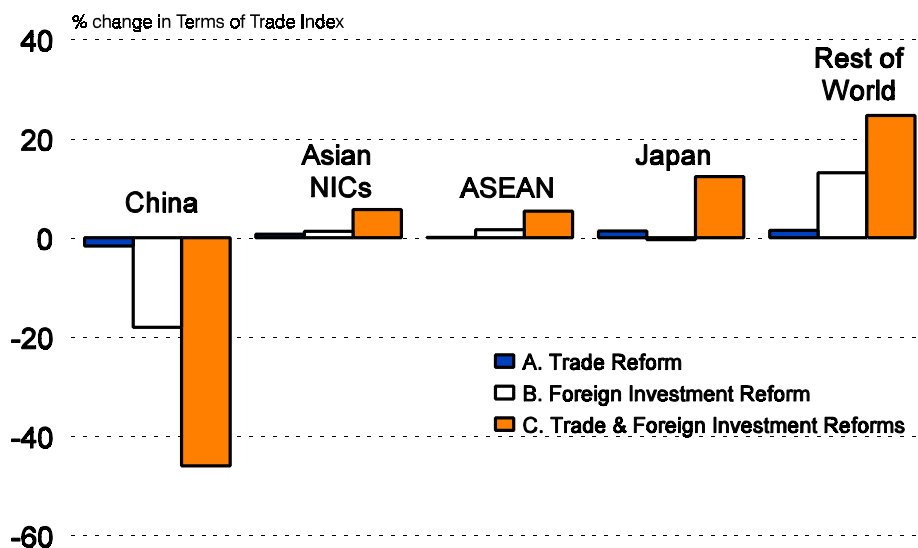
Figure 4.1
**Welfare Effects of China's Trade Reform,
 Foreign Investment Reform,
 and Trade and Foreign Investment Reforms**



Source: Lam (1996).

Note: For an explanation of the negative welfare effects reported for Japan in Experiment B, refer to Appendix 4.B.

Figure 4.2
 Terms of Trade Effects of China's Trade Reform,
 Foreign Investment Reform,
 and Trade and Foreign Investment Reforms



Source: Lam (1996).

Note: A term of trade index is broadly defined as the ratio of the average price index of a country's exports over the average price index of a country's imports. Thus a positive change in the index indicates an improvement in the country's terms of trade. By definition, a region's terms of trade gain must be another region's terms of trade loss. From a global perspective, the terms of trade effect nets out to zero.

abolishes its trade restrictions.²¹ In contrast, the ASEAN, which has endowments relatively similar to China's, is reported to experience only moderate gains.²² Netting out the terms of trade effect, the outcome is a global efficiency gain of US\$13.1 billion or 0.07% of the world's GNP (Figure 4.3).

In Experiment B, the liberalization of foreign investment restriction in China improves the efficiency in the world capital market by equalizing the rates of return across all regions. Specifically, the inflow of foreign capital into China depresses the Chinese rate of return, and the outflow of capital from other regions leads to a rise in the world rate of return. As a consequence, welfare is expected to increase for all regions.

In this experiment, China's welfare gain is registered to be 1.54% of its GNP (or US\$35.4 billion), which is relatively much higher than figures for other regions (Figure 4.1). This is because China is only a small player in the world capital market. Given that the Chinese initial rate of return is 2.7 times as great as the world rate of return (Figure 3.3), the Chinese rate of return declines by a hefty 62% (Figure 4.4) after the simulation in Experiment B. The amount of foreign capital flowing into China represents a significant 24% (or US\$109.7 billion) of the country's capital endowment (Figure 4.5). Comparatively speaking, other regions' welfare gains are less significant.²³ The results of the simulation model show that the rise in the world rate of return is rather small, at about 1.7% after the sole removal of China's foreign investment restrictions (Figure 4.4). The amount of capital exported to China accounts for about 1% to 5% of the regions' capital endowments only (Figure 4.6).

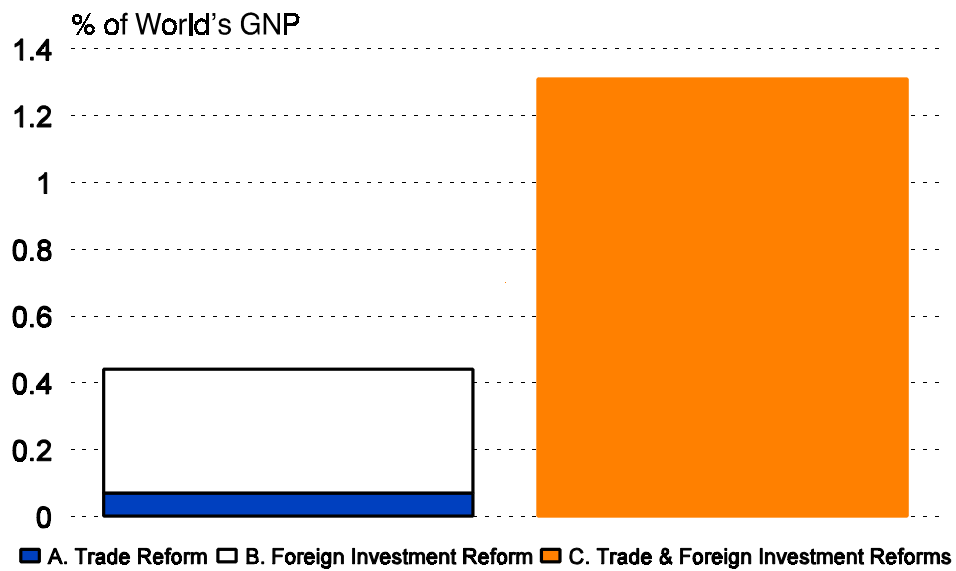
²¹ As mentioned, Hong Kong's trade and investment ties with China have been strong and have strengthened over the years since 1978. As most of the trade between China and the Asian NICs consists of trade between China and Hong Kong, it is not surprising that the simulation results show substantially higher welfare gains for the Asian NICs. However, it should be noted that the model results might over-state the welfare gains for the Asian NICs because most of China's trade with Hong Kong is only re-export trade and these re-exports have not been taken into account in the model.

²² Note that the results in Experiment C also indicate that the Asian NICs enjoy a relatively strong welfare gain (1.68% of their GNP) while the ASEAN registers only a relatively small welfare gain (0.55% of its GNP) among all the non-Chinese regions.

²³ For an explanation of the negative welfare effects reported for Japan in Experiment B, refer to Appendix 4.B.

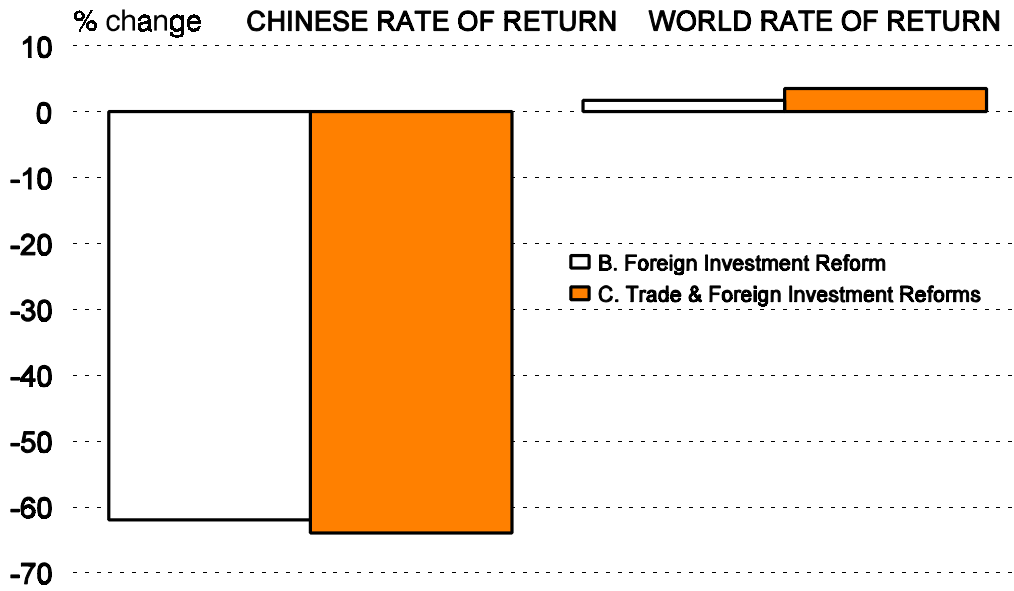
Figure 4.3

Global Efficiency Gains from China's Trade Reform,
Foreign Investment Reform, and
Trade and Foreign Investment Reforms



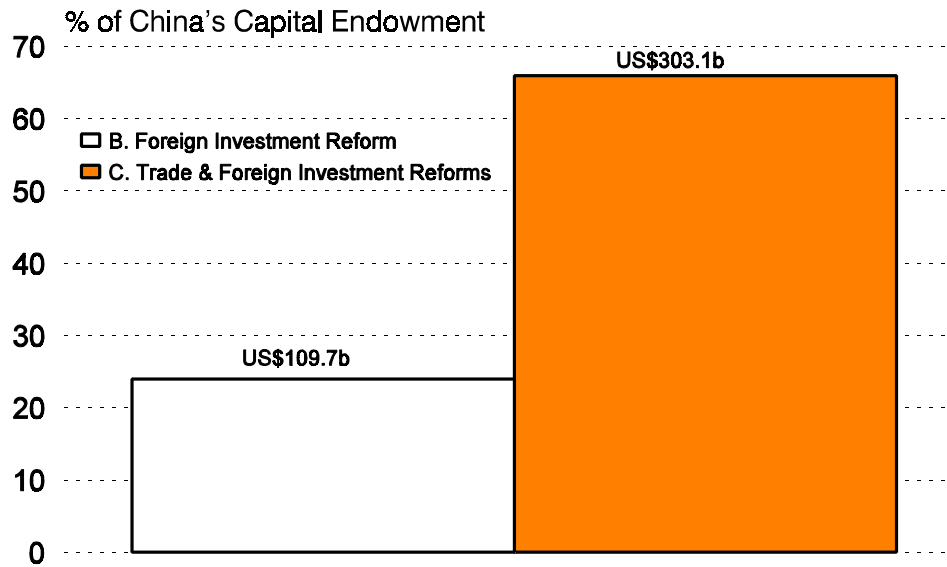
Source: Lam (1996).
World's GNP: US\$18,714 billion

Figure 4.4
Changes in the Rates of Return
after China's Foreign Investment Reform, and
and Trade and Foreign Investment Reforms



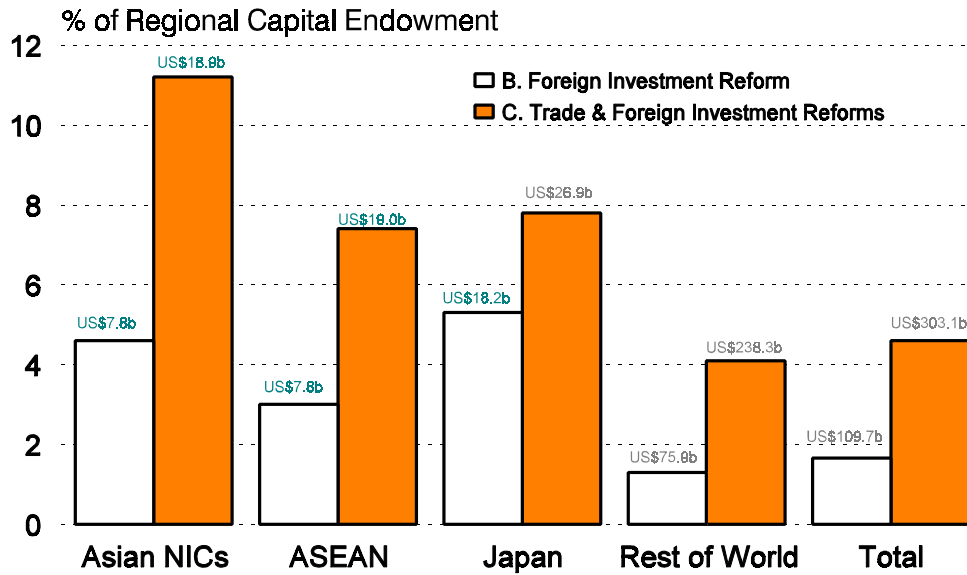
Source: Lam (1996).

Figure 4.5
Capital Service Inflows to China
after China's Foreign Investment Reform, and
Trade and Foreign Investment Reforms



Source: Lam (1996).

Figure 4.6
Regional Capital Service Outflows to China
after China's Foreign Investment Reform,
and Trade and Foreign Investment Reforms



Source: Lam (1996).

Complications arise because of the existence of China's trade restrictions in this experiment. The result reveals that removing only the foreign investment restriction can actually increase the inefficiencies of China's trade restrictions for ALL regions, which may then offset much of the welfare gain derived by each region from China's foreign investment liberalization.

The large drop of over 60% in the Chinese rate of return following the influx of foreign investment triggers substantial declines in the total value added in all Chinese sectors. This results in significant reductions in the unit costs of production across all sectors in the country. Consequently, production and export supplies expand substantially in every sector in China.

This expansion of export supplies makes China's minimum export quota constraints ineffective. China's exports in the finished-capital-goods and high-tech goods sectors thereby rise dramatically by 333% (US\$1.7 billion) and 700% (US\$31.1 billion) respectively. This leads to a further drop in China's export price index (compared with Experiment A) which translates into bigger terms of trade losses for China or bigger terms of trade gains for economies other than China (Figure 4.2).

With Experiment B, the increase in China's export supplies significantly accentuates the inefficiencies arising from China's maximum export quota constraints for ALL regions compared with the original position before the Experiment. This is because the expansion of China's export supplies in sectors where the maximum export quota constraints apply actually increases the price gaps between Chinese and international prices in these sectors. The price wedges rise by 153% in the agricultural sector, 78% in the basic-intermediate-goods sector, and 90% in the light-industrial-goods sector. On the whole, the results suggest that EVERY region's welfare losses arising from China's trade constraints are heightened when foreign investment restriction is removed.

Globally, the result suggests that the world efficiency gain arising from China's foreign investment liberalization (0.37% of the world's GNP) is much greater than from China's trade reform (0.07% of the world's GNP). Nevertheless, the analysis also suggests that the world's efficiency gain in Experiment B could have been even higher if there were no trade restrictions in China (Figure 4.3).

The results in Experiment C further confirm the interactive effects between China's trade and foreign investment reforms. The model shows that for EVERY region, the efficiency gains arising from China's trade reform are strongly enhanced if China implements foreign investment reform at the same time.

In Experiment C, the increase in supplies of Chinese exports leads to increases in Chinese exports in all sectors. This dramatic rise of exports ranges from a multiple of 1.6 in the agricultural sector to 15.6 in the light-industrial-goods sector. This translates into an even further drop in the Chinese export price index - compared with Experiment B. Consequently, other

regions enjoy significantly larger terms of trade gains that have been transferred from China (Figure 4.2).

By the same reasoning, just as inefficiencies arising from maximum export quota constraints are magnified for all regions when there is only - foreign investment reform (Experiment B), the reverse is expected when these export quotas are removed in conjunction with the foreign investment restriction (Experiment C). On the whole, the results suggest that the overall welfare gains for ALL regions arising from China's trade reform are significantly magnified when China's foreign investment restriction is simultaneously relaxed.

In sum, regional welfare gains in Experiment B could have been higher if there were no trade restrictions in China. In Experiment C, regional welfare gains from China's trade reform are strengthened as a result of the simultaneous foreign investment liberalization in China. Consequently, the welfare gains across ALL regions in Experiment C are estimated to be at least double the aggregate welfare gains of Experiment A plus Experiment B (Figure 4.1). Netting out the inter-regional transfers of terms of trade gains/losses, the model shows that the global efficiency gain is 0.07% of the world's GNP in Experiment A, 0.37% in Experiment B, and rises sharply to 1.31% of the world's GNP in Experiment C (Figure 4.3).

B. Effects of China's Trade Reform on the Global Trade Structure

China's trade reform eliminates price distortions between Chinese prices and international prices and thereby improves efficiency in world trade. Countries are able to trade more according to their comparative advantages and this leads to changes in the global trade structure. This is reflected in Table 4.2 which shows changes in sectoral trade patterns in each region following China's trade reform (Experiment A).

On a broad scale, the results of the model reflect the changing export competitiveness in China as discussed in Section II. Exports are shown to decline by 58.8% (or US\$0.3 billion) in the finished-capital-goods sector (e.g., transport equipment) and by 61.7% (or US\$2.8 billion) in the high-tech sector (e.g., chemical products), reflecting the drops in the RCA (revealed comparative advantage) indices for these sectors (Figure 2.2). These are also the sectors implicated by China's minimum export target constraints whereby exporters are effectively subsidized by the Chinese government (Figure 3.2).

Table 4.2
Changes in Sectoral Trade Patterns Arising from China's Trade Reform Alone
(Experiment A)

	Regions				
	Asian NICs	ASEAN	Japan	Rest of World	China
1. Changes in Exports (US\$ b)¹					
Agriculture	0.1	-0.1	-0.0	1.0	1.0
Basic Intermediate	-0.5	-0.7	-0.9	-0.6	7.4
Light Industrial	-3.6	-1.1	-1.3	-0.2	18.0
Finished Capital	0.4	0.0	1.9	4.4	-0.3
High-Tech	1.5	0.1	1.9	2.2	-2.8
Services	1.1	0.7	1.0	1.4	-4.8
Total	-1.0	-1.0	2.7	8.1	18.4
2. Changes in Imports (US\$ b)¹					
Agriculture	-0.0	-0.0	0.1	0.2	1.6
Basic Intermediate	-0.2	-0.0	0.7	2.0	2.3
Light Industrial	0.0	0.0	0.7	8.7	2.5
Finished Capital	-0.1	-0.0	0.1	-0.1	6.5
High-Tech	-0.1	-0.0	0.0	-0.5	3.6
Services	-0.1	-0.1	0.1	-1.8	1.2
Total	-0.4	-0.1	1.6	8.4	17.8

Source: Lam (1996).

Note: 1 Assuming the national product differentiation (i.e. Armington assumption) in this model, each region simultaneously exports and imports same commodity group.

On the other hand, exports are reported to increase drastically by 162% (or US\$18 billion) in the light-industrial-goods sector (e.g., clothing and footwear) pointing to a sharp rise in China's RCA in this area (Figure 2.2). In reality, the removal of maximum export

quota constraints in this sector is not under the direct control of China. For most major items in this sector (e.g., clothing, fabrics, and footwear), China is bound by the Multi-fibre Agreement (MFA) and the relaxation of maximum export quota constraints in China has to be negotiated multilaterally within the MFA framework. The removal of China's import licenses for all sectors allows domestic consumers to substitute domestic products for imports.

A more complicated case concerns the basic-intermediate-goods sector (e.g., petroleum products, iron and steel, and wood and paper products). With the abolition of the maximum export quota constraints, the model predicts a dramatic increase of 153% (or US\$7.4 billion) in Chinese exports in this sector. At the same time, with the sectoral import price in China estimated to be roughly at par with the sectoral international price, China's imports in this sector are calculated to increase by 27% (or US\$2.3 billion), proportionately less than increases in imports in other sectors.

However, as discussed earlier, depressed intermediate input prices are prevalent in many key export and import items in the basic-intermediate-goods sector. For example, the depressed intermediate input price of crude oil might encourage the over expansion of exports in petroleum products in this sector if and when the maximum export quota constraint is lifted for this sector. Likewise, the depressed intermediate input price of coal lowers the domestic price for major import items of iron and steel. As a consequence, iron and steel appear to be competitive with the world price, inhibiting the growth of these imports when China's import licensing control is removed.

The removal of China's minimum export quota constraints and import licensing controls in the finished-capital-goods sector (e.g., transport equipment and machineries for specialized industries) and the high-tech-goods sector (e.g., chemical products and telecommunications equipment) acts as a reinforcer encouraging exports of items in these sectors in regions other than China. Consequently, the model shows unambiguous expansions of exports in these areas for regions except China.

In contrast, the direction is uncertain in regions other than China for certain exports in the agricultural sector (e.g., cereals, crude rubber, pulp and waste paper), basic-intermediate-goods (e.g., wood and paper products, and basic metals), and the light-industrial-goods sector (e.g., yarn and fabrics, clothing). It is expected that both imports from and exports to China in these sectors will rise after the country's abolition of the maximum export quota constraints and import licensing controls. The ultimate change in exports depend primarily on the relative strength of

the import/export expansions from/to China. Overall, exports in these sectors are expected to diminish in these regions.^{24, 25}

Competition among China, the Asian NICs, and the ASEAN in exporting to the ROW region (comprised mainly of developed countries such as Canada, the U.S., and Europe) is most intense in the light-industrial-goods sector. The increase in imports of items in this sector in the Rest of the World region is registered at US\$8.7 billion. Exports for this sector from China to the Rest of the World region are calculated to increase by US\$15.0 billion. Exports of these goods from the Asian NICs and the ASEAN to the Rest of the World region decline by US\$4.0 billion and US\$1.1 billion respectively. As noted in Section II, while there has been a continual strong shift of China's comparative advantage toward low-skilled labour-intensive exports throughout the 1980s, the opposite trend is evident in the Asian NICs. The revealed comparative advantage index for the ASEAN in this area remained below one in the early 1990s.

Summary

For ALL regions, the results strongly suggest the positive complementary effect between China's trade reform and foreign investment reform. Regional welfare gains from China's trade reform are estimated to strengthen substantially if the liberalization of foreign investment restriction in the country occurs simultaneously. The results also reveal that removing only the foreign investment restriction in China can actually increase the inefficiencies of China's trade restriction for ALL regions, which in turn might offset much of each region's welfare gains arising from China's foreign investment liberalization.

On a broad scale, the model results also suggest that China's trade reform brings about a more efficient global allocation of commodities that results in countries trading more in line with their comparative advantages. While China experiences significant declines in its exports of capital-intensive, finished capital goods (e.g., transport equipment) and high-tech goods (e.g., chemical products), other regions experience a rise in their exports of these goods. Meantime, a drastic increase occurs in China's exports in the light-industrial-goods sector (e.g., clothing,

²⁴ As noted earlier, the relative strength of China's increase in exports of basic intermediate goods over an increase in imports in this sector may be due to China's distortive price structure.

²⁵ Broadly speaking, the trade effects estimated in Experiment C differ from the results in Experiment A, as follows: In Experiment C, foreign investment inflows into China lead to a substantial decline in China's rate and return and in turn reduce China's unit costs of production across all sectors by significant amounts. As a result, the expansion of China's export supplies and decrease in import demands are very strong, and overpower the impact of the removal of export and import trade constraints in China. This dominating effect acts as a drag on other economies' exports, which experience declines across all sectors.

yarns and fabrics, and footwear), in contrast with rising imports rise of these goods especially into the Rest of the World region (mainly Canada, the U.S., and Europe). At the same time there is also an indication that China's trade reform alone may be insufficient in some instances to bring about efficient trade structural changes. This is especially the case for China's basic-intermediate-goods sector, comprising (coal, iron and steel, crude oil and woodpulp), where price reform is necessary in conjunction with trade reform.

5. CONCLUSIONS

This study has demonstrated that the implications for China as well as for other trading nations are tremendous if China were to fully liberalize its trade and foreign investment restrictions. Following are some of the major findings, based on that premise:

- The potential of expanding trading opportunities between Canada and China can be enormous. While Canada's export competitiveness is particularly strong in wood products, paper products, and transport equipment, China's competitiveness in these areas is weak. The situation is reversed in the case of textile, clothing and footwear products.
- At present, with the exception of wheat, mineral salt, pulp and waste paper products, Canada is facing difficulties in diversifying exports to China in areas in which Canada is identified to have a competitive edge (e.g., wood and paper products, basic metals, and transport equipment).
- China's import plan, price control and high tariffs are still inhibiting many major and potential exports from Canada to China.
- Import restrictions in Canada (such as the Multi-Fibre Agreement) are curbing the expansion of China's exports of clothing, yarns and fabrics, and footwear to Canada.
- Deep integration exists between the Chinese and Hong Kong economies. Business opportunities between China and Canada can be enhanced if Canada utilizes its large pool of skilled immigrants from Hong Kong.
- China's trade and investment ties with the U.S. and Asia have significantly strengthened. Canada is expected to enjoy the spillover effects of benefits derived by U.S. and Asian countries from China's foreign sector reforms.
- The model used in this study shows that EVERY region benefits from China's trade reform and foreign investment reform.
- For ALL regions, the results of the model strongly suggest a positive complementary effect between China's trade reform and foreign investment reform. The model shows that the welfare gains across ALL regions when both reforms are implemented are at least double the aggregate welfare gains of trade reform alone plus foreign investment reform alone.
- Broadly speaking, China's trade reform leads to a more efficient global allocation of resources, resulting in countries trading more in line with their comparative advantages. China reports significant declines in its exports of capital-intensive industries (e.g.,

transport equipment and chemical products) while other regions' exports rise in this sector. Similarly, China's exports are estimated to increase drastically in the labour-intensive industries (e.g., clothing, yarns and fabrics and footwear), in contrast to the sharp rise of these goods into the developed countries.

- Trade reform without price reforms in the coal, iron and steel, crude oil and woodpulp industries in China may still be distorting the global trade structure.

At the present time, trade barriers exist in both China and the developed economies (as well as Canada), inhibiting many trading opportunities between them. This notwithstanding, findings of the model suggest that every region will benefit if these trade restrictions are removed. Canada is expected to gain directly from expanded trade with China, and indirectly from spillovers benefitting other economies. In this regard, Canada's strategy of forging business ties with China is important. It is equally important for Canada to encourage the diversification of its markets worldwide. It may also be mutually beneficial not only to encourage China to move toward free trade, but also for Canada to consider eliminating some of its trade barriers in the labour-intensive industries (e.g., clothing, fabrics and footwear).

The results of the model point strongly to the importance of a simultaneous implementation of trade reform and foreign investment reform in China: BOTH for the benefit of China as well as for other countries. It seems important therefore to encourage China to abolish its trade restrictions fully as well as to move jointly in the direction of a liberalized investment regime perhaps through the World Trade Organization.

The implications for China can be extended to other economies of developing countries that have long been resisting reforms in their foreign sectors. This study provides significant evidence to suggest that foreign sector reforms in these economies can be a win-win situation for both developed and developing countries.

Appendix 3.A

Estimating the Extent of China's Trade Restrictions in the mid-1980s

This appendix provides in detail the methodology and the estimation of China's sectoral trade restrictions at the original equilibrium in the mid-1980s. The estimates are used as the trade policy parameters in the model. The estimate of the difference between China's shadow domestic price and the international price at the equilibrium exchange rate in the mid-1980s gives an indication of how restrictive a particular sector is.¹ The proxies used to represent the shadow domestic prices at the original equilibrium are the domestic market prices,² and the proxy used for the shadow exchange rate is the black market exchange rate.³

The estimation of the price wedges between China's domestic market prices and international world prices involve several steps. First, major export and import items in a sector are identified. Second, prices from various data sources⁴ are used in order to calculate the trade-weighted average domestic market price and the average international price for major categories

¹ Trade in China was administered by state-owned foreign trading corporations. And even though the domestic transactions of exports and imports between producers/consumers and foreign trading corporations in China were often made at the administered state-planned prices (rather than the shadow domestic prices), the domestic pricing policy of traded goods in China would only imply a re-distribution of the rent (associated with quantitative trade constraints) from one group of individuals to another in China. The total rent generated from binding quantitative trade constraints would stay unchanged. As this study examines the allocative effects only, and not the distributive effects in China, the study abstracts from these pricing practices.

² In general, shadow prices in a domestic economy under quantitative restrictions on trade (as existed in China) may or may not be the same as domestic market prices. It depends on the distribution mechanism as to who gets the right to trade (i.e., who gets the export or import licenses). For example, under the queueing mechanism, the effective buying price (i.e., shadow price) is higher than the actual buying price (i.e., the domestic market price) for quantitatively restricted imports due to the existence of search cost (in this case, queueing cost). Under a coupon rationing mechanism, search costs are eliminated and the shadow price is equivalent to domestic market price. See Bhagwati and Krueger (1973) and Krueger (1974).

³ The black market exchange rate for China was estimated to be 6.1 yuan per one U.S. dollar in the mid-1980s, as suggested in Sung (1988, pp.15-17).

⁴ A complete list of the data sources used can be found at the end of Tables A3.1 and A3.2.

in a particular sector. Finally, Chinese prices have to be consistently re-adjusted so that they reflect a conversion into U.S. dollars (in which international prices are stated) at the black market exchange rate. Table A3.1 and Table A3.2 summarize the information used to determine the price wedges between the estimated Chinese domestic market prices and the international prices in each export and import item in the mid-1980s in China. Supporting evidence is also provided to explain why quantitative trade constraints are considered to be the binding instruments at the original equilibrium in China.⁵

In Table A3.1, if the indices for China's domestic market prices in specific sectors are less than the index for the world price (i.e., 100), it indicates that in such sectors China's exports are restricted by maximum export quotas. If the reverse is true, such sectors are subject to minimum export targets. In Table A3.2, the difference between the higher average Chinese market price and the lower average world price constitutes the per unit rent associated with the binding quantitative import control in a sector. In the basic-intermediate-goods sector, the information collected and reported in column 3 of Table A3.2 suggests that quantitative import control is applied to most of the major items in this sector. However, it is estimated that the average Chinese market price is roughly equal to the average world price, and thus quantitative import control is only binding at the original equilibrium in this sector.

⁵ For further elaboration, see Lam (1996).

Table A3.1
Determination of the Price Wedges between China's Domestic Market Prices and International Prices in China's Export Sectors in the mid 1980s

(Index for World Price = 100)

Export Sectors	Export Share and Major Items	Identification of Quantity Constraints in 1986 and other Relevant Information	Indices for Chinese Planned & Market Prices
Agriculture	<ul style="list-style-type: none"> - 15% of total exports - major items: vegetable & fruits (23%), cereals (19%), oil seeds and oleaginous fruit (12%) 	<ul style="list-style-type: none"> - <u>At least half of China's agricultural exports were destined for Hong Kong and Macau markets, where China was the only major supplier. China controlled supplies to these areas quantitatively by exercising strict export licensing control.</u> - <u>Certain export items were under the export plan, namely: tea, tobacco, rice, corn, bean products.</u> 	<ul style="list-style-type: none"> ²planned: 34.3 ³market: 77.7

Cont'd...

Table A3.1 Cont'd from page 55

Export Sectors	Export Share and Major Items	Identification of Quantity Constraints in 1986 and other Relevant Information	Indices for Chinese Planned & Market Prices
Basic Intermediate	<ul style="list-style-type: none"> - 21.4% of total exports - major items: petroleum products (46.1%), textile fibres (17.3%) 	<ul style="list-style-type: none"> - Petroleum products were <u>planned exports</u> in the mid-1980s. - <u>Planned exports</u> were imposed on quite a few of the other major items, e.g., raw silk, tungsten, antimony, building materials, and metal products. 	⁴ market: 67.6
Light Industries	<ul style="list-style-type: none"> - 24% of total exports - major items: yarns and fabrics (57%), garments (39%) 	<ul style="list-style-type: none"> - Exports of yarns and fabrics were strictly under the <u>export plan</u>. - <u>Export licensing</u> imposed in China on the exports of yarns and fabrics, and <u>quota restriction</u> imposed by developed countries restricted the amount of garments' exports. 	[*] market: 75.0
Finished Capital	<ul style="list-style-type: none"> - 2.2% of total exports - major items: cars (38%), machinery for specialized industries (25%) 	<ul style="list-style-type: none"> - A highly encouraged export sector with <u>heavy export subsidies/credits</u> and <u>favourable export incentives</u>. - Domestic market prices were generally regarded to be higher than international prices. 	[*] market: 120

(Table A3.1) Cont'd...

Table A3.1 Cont'd from page 56

Export Sectors	¹ Export Share and Major Items	Identification of Quantity Constraints in 1986 and Other Relevant Information	Indices for Chinese Planned & Market Prices
High Tech	- 4% of total exports -major items: organic & inorganic chemicals (63%)	- <u>Subsidies</u> were substantial in the exports of light chemicals. - Generally, exports of high-tech goods were to fulfil <u>export targets</u> set by the State.	² planned: 50.5 [*] market: 110

* Because information on prices is not available for these categories, "guesstimates" are used based on anecdotal information and readings from specialized literature (e.g., Lardy (1991), World Bank (1988)).

¹ Source: United Nations (1989, pp. 170-171).

² Source: Lardy (1991, pp. 92-93).

³ Sources for international prices: IMF (1991, p.162); World Bank (1989a, various pages); World Bank (1989b, various pages); USITC (1991, various pages).

Sources for Chinese market prices: Chan, Thomas (1987, p.100); Pudney, Stephen et al. (1991, p.5); Bryd, William (1988, pp. 96-99); SCSEIH (1988, various pages); CPYEB (1989, various pages).

⁴ Source: Lardy (1991, p. 94).

Table A3.2
Determination of the Price Wedges between China's Domestic Market Prices and International Prices in China's Import Sectors in the mid 1980s

(Index for World Price = 100)

Import Sectors	Import Share and Major Items	Identification of Quantity Constraints in 1986 and other Relevant Information	Indices for Chinese Planned & Market Prices
Agriculture	<ul style="list-style-type: none"> - 5.2% of total imports - major items: cereals (43%), crude rubber (12%), sugar (10%), beverages and tobacco (8%) 	<ul style="list-style-type: none"> - At least 60% of agricultural imports (e.g., grain, tobacco, and rubber) was under the <u>import plan</u>. 	³ market: 130.3
Basic Intermediate	<ul style="list-style-type: none"> - 31.6% of total imports - major items: iron/steel (50.3%), plastic material (9.6%) 	<ul style="list-style-type: none"> - Most major items were under the <u>import plan</u>, most notably imports of iron/steel, and non-ferrous metals. - 50% of the <u>items on the import licensing list</u> were steel products. 	² planned: 33.0 ³ market: 100

Cont'd ...

Table A3.2 Cont'd from page 58

Import Sectors	Import Share and Major Items	Identification of Quantity Constraints in 1986 and Other Relevant Information	Indices for Chinese Planned & Market Prices
Light Industries	<ul style="list-style-type: none"> - 4.1% of total imports - major items: textile yarn and fabrics (92%) 	<ul style="list-style-type: none"> - These are mainly non-planned imports with <u>strict import licensing</u>, <u>high tariffs</u> and <u>surcharges</u>. 	<ul style="list-style-type: none"> ²planned: 36.3 * market: 133
Finished Capital	<ul style="list-style-type: none"> - 33% of total imports - major items: machinery for specialized industries (51%) 	<ul style="list-style-type: none"> - <u>Import licensing</u> is required for machineries, capital goods, and motor vehicles. 	<ul style="list-style-type: none"> * market: 120
High Tech	<ul style="list-style-type: none"> - 5.9% of total imports - major items: telecommunications equipment (23%), electrical machinery (19%), precision instruments (18%) 	<ul style="list-style-type: none"> - <u>Import licensing</u> control is imposed on certain items, e.g., durable consumable, and medicinal products. 	<ul style="list-style-type: none"> * market: 110

Cont'd...

Table A3.2 Cont'd from page 59

* Because information on prices is not available for these categories, "guesstimates" are used based on anecdotal information and readings from specialized literature (e.g., Lardy (1991), World Bank (1988)).

¹ Source: United Nations (1989, pp. 170-171).

² Source: Lardy (1991, pp. 92-93).

³ Sources for international prices: IMF (1991, p.162); World Bank (1989a, various pages); World Bank (1989b, various pages); USITC (1991, various pages).
Sources for Chinese market prices: Chan, Thomas (1987, p.100); Pudney, Stephen et al. (1991, p.5); Bryd, William (1988, pp. 96-99); SCSEIH (1988, various pages); CPYEB (1989, various pages).

General Notes for Tables A3.1 and A3.2

1. Since its reform in the late 1970s, China introduced a two-tier pricing system, with one price set by the state (i.e., planned price) and another by the market (i.e., market price).
2. Lardy's estimates (price indices for source nos. 2 and 4) are calculated by finding the simple average price for major items in that sector. The estimate for source no. 3 is based on the trade-weighted average price for major categories in that sector. Chinese prices are converted to U.S. dollars at the internal settlement rate of 2.8 yuan per U.S. dollar for Lardy's estimates. Re-adjustment for Lardy's estimates is needed, converting Chinese prices to U.S. dollars at roughly the black market rate of 6.1 yuan per dollar [Sung, (1988)]. The estimate for source no. 3 is calculated using the conversion rate of 6.1 yuan per U.S. dollar.
3. The estimated sectoral price wedges calculated for Table A3.1 are based on major export items of China and the estimated sectoral price wedges calculated for Table A3.2 are based on major import items of China. A separate calculation for major export and import items is necessary because the use of the Armington assumption in the model implies complete specialization in production which results in a region exporting and importing the same composite commodity at the same time.
4. The model also includes the service sector, which comprises non-factor services such as personal services business services and government services. Because no price information is available for the service sector, it is assumed that the maximum export quota constraint and the import licensing constraint are just binding in the service sector at the initial equilibrium.

Appendix 3.B

China's Trade Restrictions and Price Distortions on Selected Product Groups that Affect Canada (early 1990s)

Product Group	Share of Canada's Total Exports to China (1991-1995) ¹	Canada's and China's RCA indices ²	China's Trade Restrictions and Price Distortions ³
Wheat and Meslin	1st largest export item; 33.4% -57.6%	Canada: 2.81 for cereals	Import plan still dictates the level of imports.
Live Animals & Fish	n/a	Canada: 3.28 for live animals: 1.48 for fish China: 0.08 - 0.84	Trade in live animals is non-planned, but for certain items (e.g. pork and beef), Chinese domestic prices are depressed administratively by about 25% to 50% below their world prices.
Fertilizers	major export item	Canada: 2.0-2.7	Though tariffs are relatively low (5.0%), imports are still administratively controlled by the import plan. Import rights are given only to one or a few assigned foreign trading corporations.
Pulp & Waste Paper	4th largest export item; 7.1% - 9.4%	Canada: 7.68	Import plan determines the level of imports with Chinese domestic prices set artificially below world prices. Negative value added at international prices is also calculated implying that this sector might not be able to survive under full trade liberalization. Import rights are strictly restricted.
Cork & Wood	n/a	Canada: 5.45	Similar import restrictions as the pulp and waste paper industries.
Cork & Wood Manufactures	n/a	Canada: 1.55; 2-4 times higher than the OECD average China: 0.0 - 0.56 for certain items (e.g., plywood, veneers, and cork manufactures)	Certain items are subject to the import plan (e.g., veneer, certain cork manufactures, and certain plywood). Very high tariffs (at 80%) and binding quantitative import controls exist for plywood.
Paper, Paperboard	n/a	Canada: 3.21; 2-4 times higher than OECD average China: 0.84	Benefitting from the depressed domestic intermediate input prices, value added at international price is calculated to be negative for this sector. The sector may not be able to compete under full trade liberalization.
Coal	n/a	Canada: 2.26	Heavy use of export licensing (export NTB tariff equivalent : 53%) and export tax (40%) to depress Chinese domestic market price below world parity.
Metalliferous Ores	0.0% - 2.5% for copper ores	Canada: 2.7	Still subject to import plan where domestic prices are kept artificially below world prices.
Non-Ferrous Metal	n/a	Canada: 2.32; 2-4 times higher than OECD average China: 0.9 in basic metal	China's domestic prices are reported to be competitive with world prices in the iron and steel industry, probably as a result of the low administered price for its intermediate input of coal.

Product Group	Share of Canada's Total Exports to China (1991-1995) ¹	Canada's and China's RCA indices ²	China's Trade Restrictions and Price Distortions ³
Potassium Chloride (i.e., mineral salt)	2nd largest export item: 3.9% - 10.0%	n/a	Subject to import plan.
Transport Equipment	n/a	Canada: 2.34 for road vehicle; 2 times higher than OECD average China: 0.06-0.82	Extremely high tariff rate (120%) on petrol automobile. Imports are also subject to import licensing control.

¹ Source: Trade Data on Line, Statistics Canada; Sutton and Ge (1996).

² RCA is the acronym for revealed comparative advantage. For more information, refer to the section on Changing Export Competitiveness in China (p. 10).

Source: 1992 Canada's RCA: OCED (1994); Gera (1994).

1989/90 China's RCA: World Bank (1994).

³ Source: World Bank (1994); Chen (1995).

Appendix 4.A

A Multi-Country Applied General Equilibrium Model

The multi-country general-equilibrium model used in this analysis is based on the Nguyen, Perroni, and Wigle model [Nguyen, et al (1991)] and is adapted to incorporate quantitative trade restrictions, foreign investment restriction and factor market distortions in China.

The model contains five regions: China, the Asian NICs, the ASEAN, Japan, and the Rest of the World (ROW).^{6,7} Each region is treated symmetrically. Because the focus of this study is on efficiency rather than distributive effects, each region contains only one representative agent.

Six sectors are included in each region, aggregated so as to give an indication of the overall production and trade structures of the Asian economies. These sectors include agriculture (AGR), basic intermediate (BSI), light industrial goods (LIN), finished capital goods (FCG), high-tech manufactures (HTC), and services (SVC).⁸

Capital and labour endowments are fixed in each region and factors are domestically mobile between sectors.⁹ All factors are fully employed. A notable difference in this study compared to other studies on China lies in the treatment of capital flows among regions. Capital is usually assumed to be immobile among regions. In this model, capital is homogeneous across all regions. However, this model assumes that China has a comparatively higher rate of return than other regions. This is because the model assumes that the Chinese government regulates the

⁶ The ROW region can be regarded as the major export destination of the Asian economies in this study. This is because the Asian countries export mostly to the developed world of Canada, the U.S., and Western Europe which form the major part of the ROW region in the model.

⁷ For details on the regional classification used in the model, refer to Table 4.1.

⁸ The sectoral classification used in this study is matched with that given in the UN SITC classification codes, as shown in Table 3.1.

⁹ Factor market distortions in China are modelled as ad valorem taxes and subsidies, and therefore it is assumed in the model that factors are mobile between sectors in China. Essentially, this procedure is equivalent to assuming perfectly competitive factor markets but with substantial amounts of distortionary taxes and subsidies.

amount of foreign investment flowing into the country through licensing. Labour is immobile across regions.

The Chinese government administers trade, foreign investment and factor market policies in the economy. Quantitative trade constraints such as export licensing, minimum export targets and import licensing are modelled explicitly for China at the initial equilibrium. The effects of the Chinese factor market allocation scheme are captured through consideration of the imposition of sectoral factor taxes and subsidies, taking the assumption that the net capital or the net labour tax is equal to zero at the original equilibrium.¹⁰ For Japan, the Asian NICs, the ASEAN, and the Rest of the World, import tariffs and the tariff-equivalent of non-tariff-barriers are applied. Any revenues collected by each government are re-distributed to the representative consumer in the respective regions as a lumpsum transfer. The model is solved by using the software MPS/GE [Rutherford (1989)].

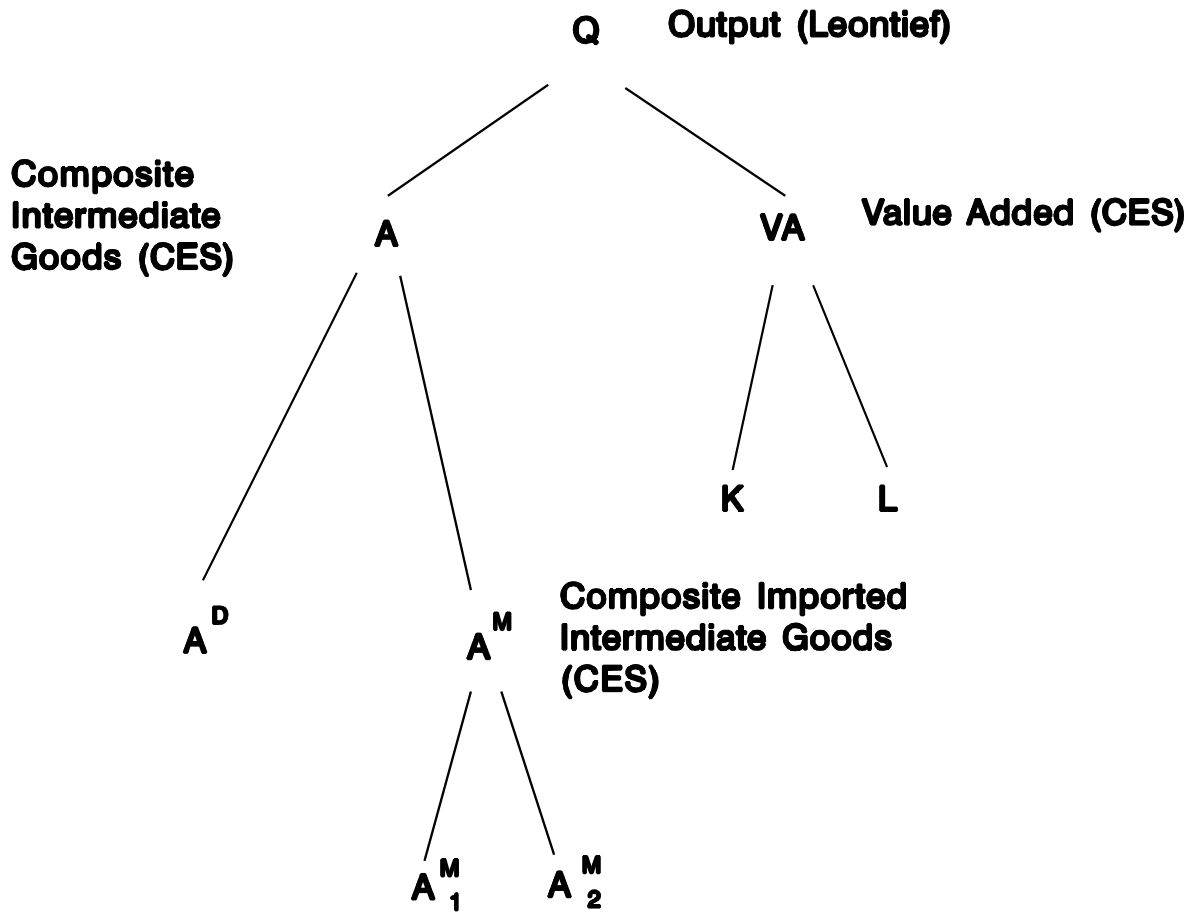
To model substitution possibilities between domestic goods and imports, the Armington assumption (AA) [Armington (1969)] is applied. This means that products are differentiated by point of production as well as by physical characteristics. For example, an American car is an imperfect substitute for a Japanese car to a consumer in any region. The AA thus captures both the export and import trade of a certain commodity, whereas the homogeneous goods assumption can only take into account net trade effects. In addition, the AA can accommodate the phenomenon of significant "cross-hauling"¹¹ in trade data, even at finely desegregated commodity classifications.

Following is a description of the production sector, the consumption sector and the government sector for each region. For consistency of notation, subscripts k,j denote commodities, while superscripts i,m denote regions. The first subscript and superscript denote origin and the second subscript and superscript denote destination. For example, $a_{kj}^{i,m}$ = requirement of commodity k produced in region i needed to produce 1 unit of commodity j in region m . The notation list is given at the end of this appendix.

¹⁰ Due to computational ease, this approach is taken to capture factor market imperfection instead of representing the distortion as quantitative restrictions.

¹¹ "Cross-hauling" is an observation in trade data that a country simultaneously exports and imports the same category of commodities.

Figure A4.1
Production Structure in each sector



1. Sector j production in region m

Producers in each sector maximize profit using a constant-returns-to-scale technology. Figure A4.1 depicts the three-level nesting structure used in the production functions. Level I combines composite intermediate inputs (A)¹² (i.e., output of each sector without specifying sources of origin) and value added (VA) using a non-substitutable Leontief production function. Level II describes substitution possibilities between domestically produced (A^D) and composite imported goods (A^M) for intermediate inputs as well as the substitution possibility between capital (K) and labour (L) in value added. Both types of substitution possibilities are represented by CES production functions. Level III uses CES functions to allow for substitution among imported intermediate inputs originating from different sources (A_i^M).

Level I: Leontief production function

$$Q_j^m = \text{MIN}\left(\frac{VA_j^m}{a_{VAj}^m}, \frac{A_{AGRj}^m}{a_{AGRj}^m}, \frac{A_{BSIj}^m}{a_{BSIj}^m}, \frac{A_{LINj}^m}{a_{LINj}^m}, \frac{A_{HTCj}^m}{a_{HTCj}^m}, \frac{A_{FCGj}^m}{a_{FCGj}^m}, \frac{A_{SVCj}^m}{a_{SVCj}^m}\right)$$

Level II: CES production function

- Industry Value Added Function

$$VA_j^m = \gamma_j^m \left[\delta_j^m (K_j^m)^{\frac{\rho_j^m - 1}{\rho_j^m}} + (1 - \delta_j^m) L_j^m \right]^{\frac{\rho_j^m}{\rho_j^m - 1}}$$

- Intermediate Production Requirement between Domestically Produced and Composite Imported Goods

$$A_{kj}^m = a_{kj}^m Q_j^m$$

¹² To avoid clutter, the notations used in Figures A4.1 and A4.2 differ slightly from the notations used in subsequent equations. Most of the indices are suppressed in Figures A4.1 and A4.2.

where

$$a_{k,j}^m = [\beta_{k,j}^m a_{k,j}^{D,m} + (1 - \beta_{k,j}^m) a_{k,j}^{I,m}]^{\frac{1}{\rho_{k,j}^m}}$$

Level III: CES Production Function

- Imported Intermediate Inputs Differentiated by Sources of Origin

$$A_{k,j}^{I,m} = a_{k,j}^{I,m} A_{k,j}^m$$

with

$$a_{k,j}^{I,m} = [\sum_i \overline{D_{k,j}^{i,m}} a_{k,j}^{i,m}]^{\frac{1}{\rho_{k,j}^{I,m}}}, \quad i \neq m$$

2. Consumer in region m

Figure A4.2 is a schematic representation of the nesting structure used for the utility functions. Level I is a Cobb Douglas function allowing substitution among composite goods (C_k) (i.e., goods without specifying sources of origin). Level II describes substitution between domestically produced (C_k^D) and composite imported commodities (C_k^M) using CES functions. Level III describes substitution possibility among imported goods from different sources ($C_k^{i,M}$) using CES functions.

Level I: Cobb Douglas Utility Function for Composite Goods

$$U^m = \prod_k (C_k^m)^{\sigma_k^m}, \quad \text{where } \sum_k \sigma_k^m = 1$$

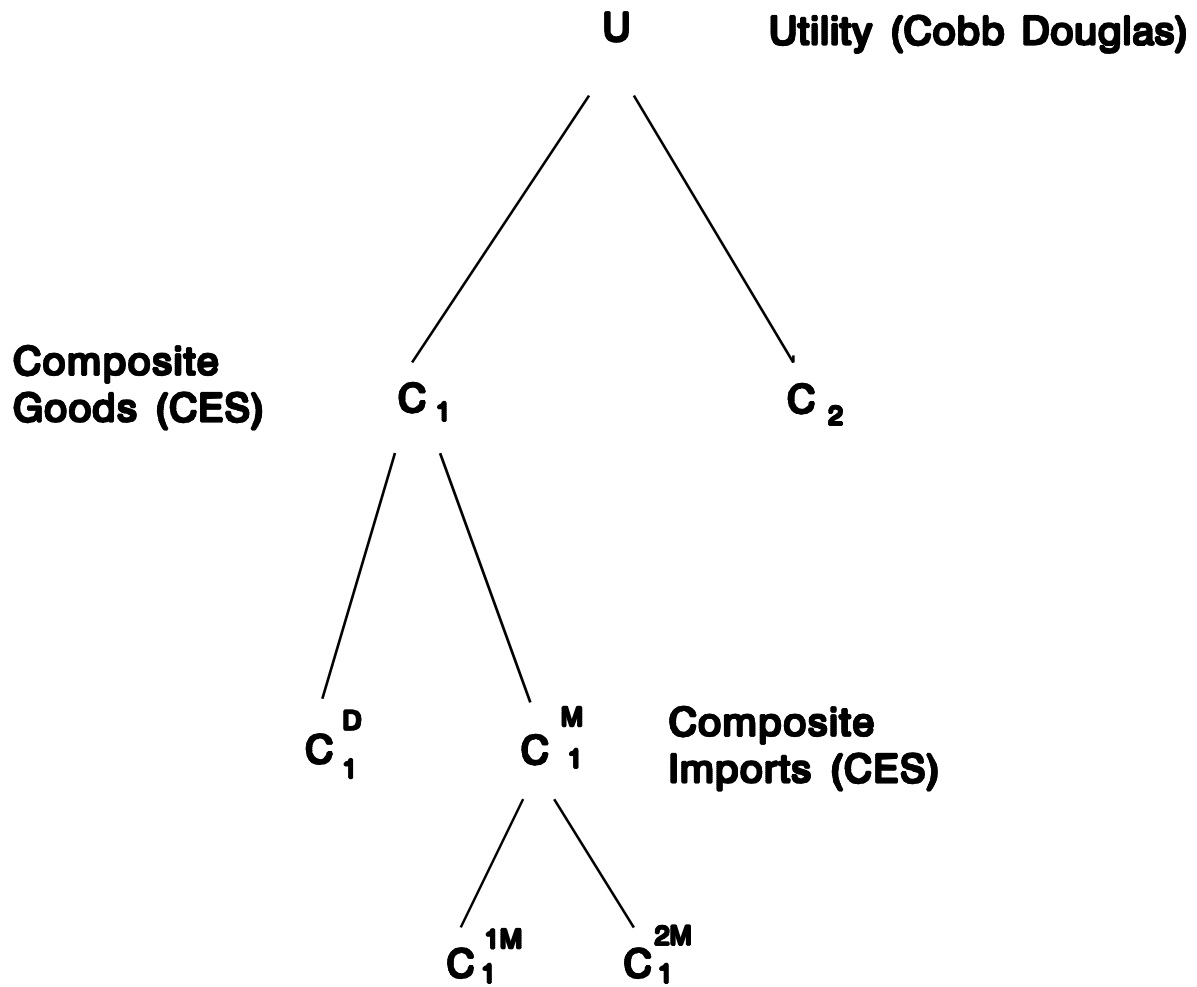
$$C_k^m = [a_k^m C_k^{D,m} + (1 - a_k^m) C_k^{I,m}]^{\frac{\sigma_k^m}{\sigma_k^m - 1}}$$

Level II: CES Utility Function for Domestically Produced and Composite Imported Goods

Level III: CES Utility Function for Imported Goods Differentiating by Sources of Origin

$$C_k^{l,m} = \left[\sum_{i \neq m} a_k^{i,m} (C_k^{i,m})^{\frac{\sigma_k^{l,m-1}}{\sigma_k^{l,m}}} \right]^{\frac{\sigma_k^{l,m}}{\sigma_k^{l,m-1}}}, i \neq m$$

Figure A4.2
Nesting Structure used in Household Utility Functions



3. Government in each region

The Chinese government administers trade, foreign investment, and factor market policies in the economy. The role of governments in other regions is to implement trade policies in their respective regions. Any revenues collected by governments are re-distributed to the representative consumers in their respective regions.

a. in China

i. Quantitative Trade Restrictions

As mentioned, China's imports were constrained by import licensing at the initial equilibrium. Exports in China were either subject to maximum export quota constraints (i.e., exports could not exceed the pre-specified amounts set by the Chinese authorities) or exports were subject to minimum export target constraints (i.e., exports must equal or exceed the minimum levels set by the government). The following describes the methodologies used to represent these quantitative trade constraints in China.

Import Licensing:

The government has endowments of import licenses, $\bar{I}_k^{i,CR}$ and possesses Leontief production functions to transform imports of good k from i (i.e., $E_k^{i,CR}, i \neq CR$) to the "domestic version" of imports of good k for CR (i.e., $M_k^{i,CR}, i \neq CR$) using both $E_k^{i,CR}$ and import licenses (i.e., $I_k^{i,CR}$) in a fixed one-to-one proportion.

$$M_k^{i,CR} = \text{MIN}[E_k^{i,CR}, I_k^{i,CR}]$$

Export Licensing:

Similarly, the government has endowments of export licenses, $\overline{D}_k^{CR,m}$. Exports of good k from CR to m (i.e., $M_k^{CR,m}$) can be produced using the "domestic version" of exports of good k from CR to m (i.e., $E_k^{CR,m}$) and export licenses (i.e., $D_k^{CR,m}$) in a fixed one-to-one proportion.

$$M_k^{CR,m} = \text{MIN}[E_k^{CR,m}, D_k^{CR,m}]$$

Export Subsidies:

The government has "negative" endowments of export targets $\overline{S}_k^{CR,m}$.¹³ Exports of good k from CR to m (i.e., $M_k^{CR,m}$) and export targets (i.e., $S_k^{CR,m}$) can be produced using "domestic" version of exports (i.e., $E_k^{CR,m}$).

$$\begin{aligned} M_k^{CR,m} &= E_k^{CR,m} \\ S_k^{CR,m} &= E_k^{CR,m} \end{aligned}$$

ii. Foreign Investment Restriction

There is only one type of capital: world capital (K^W). The Chinese government regulates the use of K^W in the economy through licensing. Consequently, the rate of return is higher in China than in other regions at the initial equilibrium. To represent the foreign investment restriction in China, the following device is used: Specify an artificial type of capital (K^{CR}) that must be used in China's production. No regions have endowments of K^{CR} but K^{CR} can be produced using the world capital K^W and "capital license" I_{CAP} in a one-to-one proportion

$$K^{CR} = \text{MIN}[K^{W,CR}, I_{CAP}],$$

where $K^{W,CR}$ = amount of world capital K^W demanded in China.

¹³ One can look at the government as having a fixed amount of debt to pay back in terms of this commodity $\overline{S}_k^{CR,m}$.

iii. Factor Taxes and Subsidies

The government imposes sectoral capital and labour taxes (or subsidies). These factor tax rates are chosen such that the net factor tax is equal to zero at the original equilibrium.

$$\sum_j t_j^K \cdot P_k^{CR} \cdot K_j^{CR} = 0$$

$$\sum_j t_j^L \cdot P_L^{CR} \cdot L_j^{CR} = 0$$

b. Regions except China

The governments' role in the regions is to collect the tariff revenue from imports which is then re-distributed to the consumer in the respective regions.

Government Revenues:

$$T^m = \sum_{i \neq m} \sum_k P_k^{i*} (\sum_j A_{kj}^{i,m} \cdot \text{TARIFF}_k^{m,P} + C_k^{i,m} \cdot \text{TARIFF}_k^{m,C}), m \neq CR$$

Global equilibrium is characterized by a set of commodity prices, factor prices, and allocations in which agents' utilities are maximized, producers make zero profits, supplies are equal to demand in the goods and factor markets, and government budgets are balanced.

Glossary of Notation

Production

Q_j^n	:	output of sector j in region m
A_{kj}^m	:	total amount of composite good k required to produce Q units of j in region m
VA_j^m	:	value added used in sector j in region m
a_{kj}^m	:	fixed intermediate input-output coefficient
$K_j^m(L_j^m)$:	capital (labour) used in sector j region m
$a_{kj}^{D,m}$:	unit requirement of domestically produced good k used in sector j in region m
$a_{kj}^{I,m}(A_{kj}^{I,m})$:	unit (total) requirement of composite imported good k used in sector j in region m
$a_{kj}^{i,m}$:	requirement of good k produced in region i used to produce 1 unit of good j in region m

Consumer

U^m	:	utility function in region m
C_k^m	:	demand of composite good k in region m
$C_k^{D,m}$:	demand of domestically produced good k in region m
$C_k^{I,m}$:	demand of composite imported good k in region m
$C_k^{i,m}$:	demand in region m of imported good k produced in i

Government**China**

$M_k^{i,CR}$:	"domestic version" of imports of good k from i into China
$E_k^{i,CR}$:	imports of good k from i into China
$I_k^{i,CR}$:	import permit required to import good k from i into China
$M_k^{CR,m}$:	exports of good k from China to region m
$E_k^{CR,m}$:	"domestic version" of exports of good k from China to region m
$D_k^{CR,m}$:	export permit required to export good k to m from China
$S_k^{CR,m}$:	export subsidy required to export good k from China to m
K^{CR}	:	"domestic version" of capital used in China
$K^{W,CR}$:	amount of world capital demanded in China
I_{CAP}	:	capital license required to import world capital into China
$t_j^K(t_j^L)$:	sectoral capital (labour) tax or subsidy rates in China
$P_k^{CR}(P_L^{CR})$:	price of Chinese capital (labour)
$K_j^{CR}(L_j^{CR})$:	units of capital (labour) required in sector j in China

Regions except China

T^m	:	income of the government in region m
P_k^{i*}	:	international price of commodity k produced in region i
$A_{kj}^{i,m}$:	amount of imported good k produced in i used in the production of j in m

$TARIFF_k^{m,u}$: tariffs plus tariff-equivalent non-tariff-barriers on good k
imposed on users u ($u =$ producers/consumers) by region m

Appendix 4.B

Explanation for the Negative Welfare Effect Indicated for Japan with the Abolition of China's Foreign Investment Restrictions (Experiment B)

The welfare loss indicated for Japan in Figure 4.1 reflects the under-estimation of the amount of Japanese capital held abroad at the original equilibrium. Owing to the static nature of the model, the data used at the original equilibrium implicitly considers the amount of trade surplus in Japan as the amount of capital services imported into the country at the start of the simulation exercise. Thus, the model interprets Japan's large trade surplus at the original equilibrium as an indicator that Japan was initially a large net debtor. When foreign investment policy is relaxed in China, Japan gains on its capital exports to China as a result of the higher world rental rate earned. On the other hand, because Japan is considered as a net debtor at the original equilibrium, it has to pay out a higher amount of capital on the services it is assumed to be importing.

This feature of the calibration exercise does not affect the models' major results significantly. First, China is basically closed to foreign investment at the original equilibrium (i.e., it is neither a net debtor or creditor). The value of its total exports is almost equivalent to the value of its total imports at the start of the experiment. Second, the aggregate global welfare effect remains unaffected because the over-estimation or under-estimation of net regional welfare gains represent inter-regional transfers only and, other than Japan, these inter-regional transfers are not expected to be important for the regions.

BIBLIOGRAPHY

- Ahmad, A., Someshwar Rao, and Colleen Barnes (1996), "Foreign Direct Investment and APEC Economic Integration", Industry Canada Working Paper Number 8, 1996.
- Ahmad, A., and Someshwar Rao (1996), "Trade and Foreign Direct Investment Linkages among APEC Economies," forthcoming.
- Armington, Paul (1969), "A Theory of Demand for Products Distinguished by Place of Production", International Monetary Fund Staff Papers, 16:159-176.
- Bhagwati, J. and A. Krueger, (1973), "Exchange Control, Liberalization, and Economic Development," American Economic Review, 419-27, May.
- Bryd, William, (1988). "The Market Mechanism and Economic Reforms in Chinese Industry," Ph.D. Thesis, Harvard University.
- Chan, Thomas, (1987). "China's Price Reform in the Period of Economic Reform," The Australian Journal of Chinese Affairs, 18:85-108, July.
- Chen Wenjing (1995), "Sino-Canadian Economic Relations: Priority Areas and Future Potential", in Sino-North American Trade: Challenges and Opportunities, edited by Leonard Waverman, Canada: University of Toronto Press.
- Chinese Price Yearbook Editorial Board (CPYEB), (1989), "Chinese Price Yearbook", Beijing: Chinese Statistical Publishing House (Zhongguo Wujia Nianjian Bianji Weiyuanhui, (1989), Zhongguo, Wujia Nianjian, Beijing: Zhongguo Tongji Chubanshe).
- Gera Surendra (1994), "East Asia: Linkages to Opportunity, Trade and Investment," prepared for presentation at the conference on "Succeeding in the Global Economy: Forging Business Links for Atlantic Canada", St. John, September 22-23, 1994.
- Grant, Michael and Julie MacLure (1995), "Profiting from China's Rapid Economic Growth: a Canadian Perspective of Guangdong Province," The Conference Board of Canada, Report no. 141-95.
- IMF (1991), International Financial Statistics Yearbook, 1989, Washington, D.C.
- Krueger, Anne (1974), "The Political Economy of the Rent Seeking Economy," American Economic Review, 64(3): 291-303, June.
- Lam, Winnie (1996), "Impact on Asia of China's Trade, Foreign Investment, and Factor Market Reforms: A General Equilibrium Approach", Ph.D. dissertation, University of Western Ontario.

Lardy, Nicholas R. (1991), "Foreign Trade and Economic Reform in China, 1978-1990," Cambridge University Press, Cambridge.

Nguyen, Trien, C. Perroni, and R. Wigle (1990), "A Micro-consistent dataset for the Analysis of World Trade: Source and Methods," version 1.5.

OECD (1994), Manufacturing Performance: A Scoreboard of Indicators, Paris: OECD.

Pudney, Stephen and Limin Wang, (1991), "Rationing and Consumer Demand in China: Simulating the Effects of a Reform of the Urban Food Pricing System," a paper prepared for the Research Programme on the Chinese Economy, STICERD, London School of Economics.

Ruoen Ren and Chen Kai (1994), "An Expenditure-Based Bilateral Comparison of Gross Domestic Product between China and the United States," Review of Income and Wealth, 40(4): 377-394.

Rutherford, T.F. (1989), "General Equilibrium Modelling with MPS/GE," University of Western Ontario, London, Canada.

Sicular, Terry (1995), "Going on the Dole: Why China's State Enterprises Choose to Lose," Department of Economics, University of Western Ontario discussion paper.

State Statistical Bureau City Social Economic Investigation Headquarters (SCSEIH), (1988), Chinese Price Statistical Yearbook, Beijing: Chinese Statistical Publishing House (Guojia Tongjiju Chengshi Shehui Jingji Diaocha Zhongbu, (1988), Zhongguo Wujia Tongji Nianjian, Beijing: Zhongguo Tongji Chubanshe).

State Statistical Bureau Industrial Transport Statisticians eds., (1993), China's Industrial Economic Statistical Yearbook, Beijing: Chinese Statistical Publishing House (Guojia Tongjiju Gongye Jiaotong Tongji Shi, eds., (1993), Zhongguo Gongye Jingji Tongji Nianjian, Beijing: Zhongguo Tongji Chubanshe).

Statistics Canada, Trade Data on Line.

_____, World Trade Database.

Sung Yun-wing (1996), "Chinese Outward Investment in Hong Kong: Trends, Prospects, and Policy Implications," OECD Working Papers, Technical Papers no. 113, Paris.

_____, (1988), "The Impact of the Devaluation of the Renminbi on China's Trade," Paper presented for the Allied Social Science Association Annual Meeting, Chinese Economic Association in North America, December 28-30, New York.

Sutton Brent and Zhili Ge (1996), "Opportunities and Risks for Canadian Business in China, A Business Perspective on Policy Issues," The Conference Board of Canada.

United Nations, (1989), 1989 International Trade Statistics Yearbook, volume I: Trade by Country.

United States International Trade Commission, (1991), "Nonrubber Footwear Quarterly Statistical Report," report to the Senate Committee on Finance on Investigation No. 332-191, under section 332 of the Tariff Act of 1930, Washington, D.C., June.

U.S. Department of Commerce, (1995), Survey of Current Business, Washington, D.C.

World Bank (1994), "China's Foreign Trade Reform," Washington D.C.: the World Bank.

_____, (1989a), "Price Prospects for Major Primary Commodities," 1990-2005, Volumes I and II, Washington, D.C.: the World Bank.

_____, (1989b), "Commodity Trade and Price Trends," The Johns Hopkins University Press, Baltimore and London.

_____, (1988), "China: External Trade and Capital," Washington D.C.: the World Bank.

World Markets Service (1997), World Economic Outlook, Volume 1, First Quarter, 1997, Lexington, MA: DRI/McGraw-Hill.

Zou, G., Jun Ma, and Zhugang Wang, "China's Coastal Development Strategy and Pacific Rim Economic Integration," The Journal of East and West Studies, Volume 19, 1990(2):58-61.

INDUSTRY CANADA RESEARCH PUBLICATIONS

INDUSTRY CANADA WORKING PAPER SERIES

- No. 1 **Economic Integration in North America: Trends in Foreign Direct Investment and the Top 1,000 Firms**, Industry Canada, Micro-Economic Policy Analysis Staff including John Knubley, Marc Legault and P. Someshwar Rao, 1994.
- No. 2 **Canadian-Based Multinationals: An Analysis of Activities and Performance**, Industry Canada, Micro-Economic Policy Analysis Staff including P. Someshwar Rao, Marc Legault and Ashfaq Ahmad, 1994.
- No. 3 **International R&D Spillovers Between Industries in Canada and the United States**, Jeffrey I. Bernstein, Carleton University and the National Bureau of Economic Research, under contract with Industry Canada, 1994.
- No. 4 **The Economic Impact of Mergers and Acquisitions on Corporations**, Gilles McDougall, Micro-Economic Policy Analysis, Industry Canada, 1995.
- No. 5 **Steppin' Out: An Analysis of Recent Graduates Into the Labour Market**, Ross Finnie, School of Public Administration, Carleton University and Statistics Canada, 1995.
- No. 6 **Measuring the Compliance Cost of Tax Expenditures: The Case of Research and Development Incentives**, Sally Gunz, University of Waterloo, Alan Macnaughton, University of Waterloo, and Karen Wensley, Ernst & Young, Toronto, under contract with Industry Canada, 1996.
- No. 7 **Governance Structure, Corporate Decision-Making and Firm Performance in North America**, P. Someshwar Rao and Clifton R. Lee-Sing, Micro-Economic Policy Analysis, Industry Canada, 1996.
- No. 8 **Foreign Direct Investment and APEC Economic Integration**, Ashfaq Ahmad, P. Someshwar Rao and Colleen Barnes, Micro-Economic Policy Analysis, Industry Canada, 1996.
- No. 9 **World Mandate Strategies for Canadian Subsidiaries**, Julian Birkinshaw, Institute of International Business, Stockholm School of Economics, under contract with Industry Canada, 1996.
- No. 10 **R&D Productivity Growth in Canadian Communications Equipment and Manufacturing**, Jeffrey I. Bernstein, Carleton University and The National Bureau of Economic Research, under contract with Industry Canada, 1996.

- No. 11 **Long-run Perspective on Canadian Regional Convergence**, Serge Coulombe, Department of Economics, University of Ottawa, and Frank C. Lee, Industry Canada, 1996.
- No. 12 **Implications of Technology and Imports on Employment and Wages in Canada**, Frank C. Lee, Industry Canada, 1996.
- No. 13 **The Development of Strategic Alliances in Canadian Industries: A Micro Analysis**, Sunder Magun, Applied International Economics, 1996.
- No. 14 **Employment Performance in the Knowledge-Based Economy**, Surendra Gera, Industry Canada, and Philippe Massé, Human Resources Development Canada, 1996.
- No. 15 **The Knowledge-Based Economy: Shifts in Industrial Output**, Surendra Gera, Industry Canada, and Kurt Mang, Department of Finance, 1997.
- No. 16 **Business Strategies of SMEs and Large Firms in Canada**, Gilles Mcdougall and David Swimmer, Micro-Economic Policy Analysis, Industry Canada, 1997.
- No. 17 **Impact of China's Trade and Foreign Investment Reforms on the World Economy**, Winnie Lam, Micro-Economic Policy Analysis, Industry Canada, 1997.

INDUSTRY CANADA DISCUSSION PAPER SERIES

- No. 1 **Multinationals as Agents of Change: Setting a New Canadian Policy on Foreign Direct Investment**, Lorraine Eden, Carleton University, 1994.
- No. 2 **Technological Change and International Economic Institutions**, Sylvia Ostry, Centre for International Studies, University of Toronto, under contract with Industry Canada, 1995.
- No. 3 **Canadian Corporate Governance: Policy Options**, Ronald J. Daniels, Faculty of Law, University of Toronto, and Randall Morck, Faculty of Business, University of Alberta, 1996.
- No. 4 **Foreign Direct Investment and Market Framework Policies: Reducing Frictions in APEC Policies on Competition and Intellectual Property**, Ronald Hirshhorn, 1996.
- No. 5 **Industry Canada's Foreign Investment Research: Messages and Policy Implications**, Ronald Hirshhorn, 1997.

INDUSTRY CANADA OCCASIONAL PAPER SERIES

- No. 1 **Formal and Informal Investment Barriers in the G-7 Countries: The Country Chapters**, Industry Canada, Micro-Economic Policy Analysis Staff including Ashfaq Ahmad, Colleen Barnes, John Knuble, Rosemary D. MacDonald and Christopher Wilkie, 1994.
- Formal and Informal Investment Barriers in the G-7 Countries: Summary and Conclusions**, Industry Canada, Micro-Economic Policy Analysis Staff including Ashfaq Ahmad, Colleen Barnes and John Knuble, 1994.
- No. 2 **Business Development Initiatives of Multinational Subsidiaries in Canada**, Julian Birkinshaw, University of Western Ontario, under contract with Industry Canada, 1995.
- No. 3 **The Role of R&D Consortia in Technology Development**, Vinod Kumar, Research Centre for Technology Management, Carleton University, and Sunder Magun, Centre for Trade Policy and Law, University of Ottawa and Carleton University, under contract with Industry Canada, 1995.
- No. 4 **Gender Tracking in University Programs**, Sid Gilbert, University of Guelph, and Alan Pomfret, King's College, University of Western Ontario, 1995.
- No. 5 **Competitiveness: Concepts and Measures**, Donald G. McFetridge, Department of Economics, Carleton University, 1995.
- No. 6 **Institutional Aspects of R&D Tax Incentives: The SR&ED Tax Credit**, G. Bruce Doern, School of Public Administration, Carleton University, 1995.
- No. 7 **Competition Policy as a Dimension of Economic Policy: A Comparative Perspective**, Robert D. Anderson and S. Dev Khosla, Economics and International Affairs Branch, Bureau of Competition Policy, Industry Canada, 1995.
- No. 8 **Mechanisms and Practices for the Assessment of The Social and Cultural Implications of Science and Technology**, Liora Salter, Osgoode Hall Law School, University of Toronto, under contract with Industry Canada, 1995.
- No. 9 **Science and Technology: Perspectives for Public Policy**, Donald G. McFetridge, Department of Economics, Carleton University, under contract with Industry Canada, 1995.
- No. 10 **Endogenous Innovation and Growth: Implications for Canada**, Pierre Fortin, Université du Québec à Montréal and the Canadian Institute for Advanced Research, and Elhanan Helpman, Tel Aviv University and the Canadian Institute for Advanced Research, under contract with Industry Canada, 1995.

- No. 11 **The University-Industry Relationship in Science and Technology**, Jérôme Doutriaux, University of Ottawa, and Margaret Barker, Meg Barker Consulting, under contract with Industry Canada, 1995.
- No. 12 **Technology and the Economy: A Review of Some Critical Relationships**, Michael Gibbons, University of Sussex, under contract with Industry Canada, 1995.
- No. 13 **Management Skills Development in Canada**, Keith Newton, Industry Canada, 1995.
- No. 14 **The Human Factor in Firm's Performance: Management Strategies for Productivity and Competitiveness in the Knowledge-Based Economy**, Keith Newton, Industry Canada, 1996.
- No. 15 **Payroll Taxation and Employment: A Literature Survey**, Joni Baran, Industry Canada, 1996.
- No. 16 **Sustainable Development: Concepts, Measures, Market and Policy Failures at the Open Economy, Industry and Firm Levels**, Philippe Crabbé, Institute for Research on Environment and Economy, University of Ottawa, 1997.

JOINT PUBLICATIONS

Capital Budgeting in the Public Sector, in collaboration with the John Deutsch Institute, Jack Mintz and Ross S. Preston eds., 1994.

Infrastructure and Competitiveness, in collaboration with the John Deutsch Institute, Jack Mintz and Ross S. Preston eds., 1994.

Getting the Green Light: Environmental Regulation and Investment in Canada, in collaboration with the C.D. Howe Institute, Jamie Benidickson, G. Bruce Doern and Nancy Olewiler, 1994.

To obtain copies of documents published under the *RESEARCH PUBLICATIONS PROGRAM*, please contact:

Publications Officer
Micro-Economic Policy Analysis
Industry Canada
5th Floor, West Tower
235 Queen Street
Ottawa, Ontario, K1A 0H5

Telephone: (613) 952-5704 Fax: (613) 991-1261